# dlkit Documentation

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This documentation for the Digital Learning Toolkit (DLKit), like the toolkit itself, is still under development. It currently covers only a small handful of the 180 service packages and over 10,000 educational service APIs that have been defined by MIT's Office of Digital Learning and its collaborators to date.

The DLKit codebase is generated from the Open Service Interface Definitions (OSIDs), an extensive and growing suite of interface contract specifications that describe the integration points among the core services and components that make up modern educational systems.

Note that this documentation is intended for API consumers. However, at the heart of DLKit is an integration stack that is even more closely aligned with the OSID specifications. This has been designed to allow third parties to extend the library with alternative or additional implementations of any of the defined services for the purposes of service integration, technology migration, service adaptation, etc. Documentation written for service implementers and system integrators, including implementation notes and compliance information, will be provided elsewhere.

The complete OSID specification can be found at http://osid.org/specifications.

Currently, DLKit works with Python 2.7, 3.4, 3.5, and 3.6.

If you are interested in learning more about the DLKit Python libraries documented here, please contact dlkitinfo@mit.edu

# CHAPTER 1

# Get DLKit

The latest release of DLKit and related dependencies are available here: https://bitbucket.org/cjshaw/

The core MongoDB implementation is located in the https://bitbucket.org/cjshaw/dlkit repository, which has submodule dependencies on a number of the other repositories on the site. More information about this can be found in the introduction section.

# CHAPTER 2

Testing

Unit tests and limited functional tests for DLKit are available here: https://bitbucket.org/cjshaw/dlkit-tests

# CHAPTER 3

# Contents:

# Introduction to DLKit

### **Basic OSID terms**

Some familiarity with the OSID models and terms will help understand how to use DLKit.

Each service has its own set of packages. Some commonly used DLKit services include assessment, learning, and repository. Within each service, users encounter three types of objects: managers, sessions, and objects. sessions are the verbs of the system (what you want to do), while objects are the nouns (what you are working on). For example, to look up learning objectives in the learning service, you would use a ObjectiveLookupSession, which has all the methods you need to look up objectives, like get\_objective(), get\_objectives\_by\_ids(), etc.

#### Managers

Managers act as the entry points to each service by granting access to sessions. For basic DLKit usage, users will most likely use the service managers to get the service catalog, which has been overloaded to include the most used methods (i.e. the catalog for learning is an ObjectiveBank).

Advanced users can use the service manager in a strict OSID fashion as well.

#### Sessions

Sessions allow users to perform a certain action on a desired object. For basic users, they will most likely never encounter a session, so the usage is only address in the advanced usage page.

#### **Objects**

In each OSID service, there are typically two types of objects – the overall catalog, as well as the more granular object that resides in the catalogs.

Catalogs are generally used for authorization (who can do what actions to what objects), and in DLKit these authorizations flow down. If catalog B is a parent of catalog C, and I can create things in catalog B, then I can automatically create things in catalog C as well.

For example, in the learning service, the catalog is an ObjectiveBank, and the more granular resources are objectives.

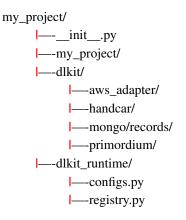
# Usage

While DLKit is an implementation of the OSIDs, a convenience layer has been built on top of the OSID implementation. This layer is called dlkit.services, and it is recommended that new developers start working with this layer, first. General instructions for these are outlined in the *Basic DLKit Usage* section.

If users find certain functionality missing or inconvenient, then they should check out the Advanced DLKit Usage section.

# **Directory Structure**

Until we have a good way to package DLKit and make it available as a Python installable, the easiest way to use it is to git clone it into your project directory along with its submodules. An example directory structure is:



# **Dependencies**

DLKit has several dependencies that are also listed as git submodules. They are relisted here for convenience, along with their git repositories:

- AWS Adapter (for storing / retrieving files from Amazon AWS S3): https://bitbucket.org/cjshaw/aws\_adapter
- Handcar (MC3 learning service-based implementation): https://bitbucket.org/cjshaw/handcar
- Primordium (basic object types): https://bitbucket.org/cjshaw/primordium
- Record extensions (for extending objects in the MongoDB implementation): https://bitbucket.org/cjshaw/ records

# **Basic DLKit Usage**

Runtimes and basic DLKit usage are also covered in the sample *Tutorial: DLKit Learning Service Basics*. The information is discussed here in a more general sense. The examples below explicitly use the Django runtime, but you can modify them to suit your custom runtime.

## **Configuring Runtimes**

To access managers using a runtime, you first need to create a user proxy, which wraps the user object and allows DLKit to calculate authorizations. You then pass the proxy into the runtime and request managers.:

```
from dlkit_django import RUNTIME, PROXY_SESSION
condition = PROXY_SESSION.get_proxy_condition()
condition.set_http_request(request)
proxy = PROXY_SESSION.get_proxy(condition)
lm = RUNTIME.get_service_manager('LEARNING', proxy)
```

### **Service Managers and Catalogs**

In the services convenience layer, you typically deal with two objects for each service, the manager and a catalog, which subclass a subset of OSID classes. This means that you do not have to worry about managing OSID sessions – this is managed for you and simplifies your interactions with DLKit.

#### **Service Managers**

Service managers typically give you access to all methods that do not require a specific catalog. For example, the LearningManager lets you create, update, query, and delete ObjectiveBanks in the learning service.:

```
bank = lm.get_objective_bank(bank_id)
```

#### **Service Catalogs**

The catalogs you get back from a service manager typically give you access too all objects within that catalog. So an ObjectiveBank lets you create, update, query, and delete learning objectives and activities.:

```
objectives = bank.get_objectives()
```

# **Creating and Updating objects**

To create or update an object, DLKit uses forms .:

```
form = lm.get_objective_bank_form_for_create([])
form.display_name = "My new test bank"
new_bank = lm.create_objective_bank(form)
```

The optional parameter (on creation) allows you to specify which record extensions, if any, you want applied to the object. For example, an Open edX-type objective bank might have additional methods that allow you to export content in OLX format.

Once you have an object's id, you can also update it with a form .:

```
form = lm.get_objective_bank_form_for_update(bank_id)
form.description = "For testing with"
updated_bank = lm.update_objective_bank(form)
```

To update objects within a catalog, you would do the same thing, but via a catalog object .:

```
form = bank.get_objective_form_for_create([])
form = bank.get_objective_form_for_update(objective_id)
```

# Advanced DLKit Usage

Sometimes you may need to use DLKit in a stricter OSID fashion, bypassing the services convenience methods discussed in *Basic DLKit Usage*. To use DLKit in a more OSID-y way, you would manually manage the various admin / lookup / etc. sessions, from either a service manager or a service catalog.

Currently, the main use case when you would need to manage sessions yourself is if you want to look up objects without knowing their catalog IDs. For example, you have an <code>objective\_id</code> but not the <code>objective\_bank\_id</code> and need to grab the objective. In the future, we plan to build that capability into the <code>services</code> convenience layer, to reduce the need for manual session management.:

```
ols = lm.get_objective_lookup_session()
objective = ols.get_objective(objective_id)
```

# **Configuring DLKit**

DLKit requires the use of a runtime environment, from which you configure the user proxy object, get managers, and define which implementations are used for each service (among other things). For example, you might use the built-in MongoDB learning service, or you may decide to use the MC3 RESTful service, Handcar.

Two examples are available, one for Open edX and another for Django. You can also build your own, using these as templates:

- Django runtime: https://bitbucket.org/cjshaw/dlkit\_django
- Open edX runtime: https://bitbucket.org/cjshaw/dlkit\_edx

Both runtimes require the addition of configs.py and registry.py files. These allow different instances of DLKit to behave differently, depending on the project's needs.

**NOTE:** With the Django runtime, you can establish the configuration values in your project's settings.py file, which is then referenced in the runtime files below. This is for your convenience. You can also configure the settings directly in the files below, as shown in the Open edX runtime.

### configs.py

This file allows you to define various parameters used in the production runtime as well as a testing runtime. The only required values are for BOOTSTRAP and SERVICE (and for running the DLKit tests, TEST\_SERVICE).

SERVICE should point to the implementation you want to use for each service (i.e. Handcar for the learning service, MongoDB for the assessment service).

Currently, this file also lets you manage the following

- Amazon AWS credentials, if using the AWS shim adapter.
- MongoDB authority, for identifying objects / IDs created by this instance.
- MongoDB database prefix, to namespace your collections and documents.
- MongoDB fields to index on.

- MongoDB fields to search on, for keyword searches.
- MongoDB host URI, if using a sharded repository.

An example skeleton is included in the runtime repository.

### registry.py

Similar to setup.py, this file includes the various entry points for each service and implementation. For example, if you expect to use the grading service from the MongoDB implementation, you need to make sure it has an entry in this file. An example skeleton is included in the repository.

## handcar\_configs.py

If you are using the *MC3 Handcar* learning service, then you will also need to add in proxy agent keys for the appropriate service / server combination in this file, if you want more than read-access.

# **Tutorial: DLKit Learning Service Basics**

This tutorial is under development. It currently focuses on aspects of the Learning service. At the time of this writing, MIT's Office of Digital Learning is supporting a production learning objective management service called the MIT Core Concept Catalog (MC3). DLKit includes an underlying implementation that uses MC3 for persistence. As a result, this tutorial uses examples primarily from this particular service, which deals with managing learning objectives, learning paths and relationships between learning objectives and educational assets, assessments, etc, since there is data available for testing.

All of the other DLKit Interface Specifications build on most of the same patterns outlined in this tutorial, beginning with loading managers. Make sure that the dlkit package is in your python path or install the library.

### The Runtime Manager and Proxy Authentication

Service managers are instantiated through a Runtime Manger, which are designed to work with certain runtime environments, like Django or edX/XBlock runtimes. To get access to these runtime environments please contact dlkitinfo@mit.edu. Install the runtime environment you want to use and make sure that your Django project's settings.py includes dlkit\_django or dlkit\_xblock as appropriate.

Now you can get the RuntimeManager root instance for your runtime environment. Note that there is only one, and it gets instantiated at environment launch time, it is thread-safe and used by all consumer application sessions:

from dlkit\_django import RUNTIME

This runtime object is your gateway to access all the underlying service managers and their respective service sessions and functionality

The django runtime knows about Django's own services for users. You will have access to an HTTPRequest object that includes an user authentication (the request variable in the examples below). This needs to be encapsulated in a Proxy object:

```
from dlkit_django import PROXY_SESSION
condition = PROXY_SESSION.get_proxy_condition()
condition.set_http_request(request)
proxy = PROXY_SESSION.get_proxy(condition)
```

Or, if you are standing up dlkit in edX, get an XBlockUser() object from the xblock runtime. That object is assumed to be stored the 'xblock\_user' variable below:

```
from dlkit_xblock import PROXY_SESSION
condition = PROXY_SESSION.get_proxy_condition()
condition.set_xblock_user(xblock_user)
proxy = PROXY_SESSION.get_proxy(condition)
```

Now you have a Proxy object that holds the user data and eventually other stuff, like locale information, etc, that can be used to instantiate new service Managers, which you can also insert into your HttpRequest.session:

```
from dlkit_django import RUNTIME
request.session.lm = RUNTIME.get_service_manager('LEARNING', proxy)
```

For the duration of the session you can use this for all the other things. that you normally do.

There is a lot more you can do with the RuntimeManager, but getting service managers will be the most common task. One of the other important tasks of this manager, is configuration the underlying service stack based on the configs.py file and associated helpers. We will cover this later.

### Loading the Learning Manager

All consumer applications wishing to use the DLKit Learning service should start by instantiating a LearningManager (don't worry about the proxy for now):

lm = runtime.get\_service\_manager('LEARNING')

Everything you need to do within the learning service can now be accessed through this manager. An OSID service Manager is used like a factory, providing all the other objects necessary for using the service. You should never try to instantiate any other OSID object directly, even if you know where its class definition resides.

The simplest thing you can do with a manager is to inspect its display\_name and description methods. Note that DLKit always returns user-readable strings as DisplayText objects. The actual text is available via the get\_text() method. Other DisplayText methods return the LanguageType, ScriptType and FormatType of the text to be displayed:

Results in something that looks like this:

```
Learning Manager successfully instantiated:
MC3 Learning Service
OSID learning service implementation of the MIT Core Concept Catalog (MC3)
(this description was written using the English language)
# Note that the implementation name and description may be different for you.
# It will depend on which underlying service implementation your dlkit library is
# configured to point to. More on this later
```

Alternatively, the Python OSID service interfaces also specify property attributes for all basic "getter" methods, so the above could also be written more Pythonically as:

```
print "Learning Manager successfully instantiated:"
print " " + lm.display_name.text
print " " + lm.description.text
print (" (this description was written using the " +
    lm.description.language_type.display_label.text + " language) \n")
```

For the remainder of this tutorial we will use the property attributes wherever available.

### Looking up Objective Banks

Managers encapsulate service profile information, allowing a consumer application to ask questions about which functions are supported in the underlying service implementations that it manages:

```
if lm.supports_objective_bank_lookup():
    print "This Learning Manager can be used to lookup ObjectiveBanks"
else:
    print "What a lame Learning Manager. It can't even lookup ObjectiveBanks"
```

The LearningManager also provides methods for getting ObjectiveBanks. One of the most useful is get\_objective\_banks(), which will return an iterator containing all the banks known to the underlying implementations. This is also available as a property, so treating objective\_banks as an attribute works here too:

```
if lm.supports_objective_bank_lookup():
    banks = lm.objective_banks
    for bank in banks:
        print bank.display_name.text
else:
    print "Objective bank lookup is not supported."
```

This will print a list of the names of all the banks, which can be thought of as catalogs for organizing learning objectives and other related information. At the time of this writing the following resulted:

```
Crosslinks
Chemistry Bridge
i2.002
Python Test Sandbox
x.xxx
```

Note that the OSIDs specify to first ask whether a functional area is supported before trying to use it. However, if you wish to adhere to the Pythonic EAFP (easier to ask forgiveness than permission) programming style, managers will throw an Unimplemented exception if support is not available:

```
try:
    banks = lm.objective_banks
except Unimplemented:
    print "Objective bank lookup is not supported."
else:
    for bank in banks:
        print bank.display_name.text
```

The object returned from the call to get\_objective\_banks() is an OsidList object, which as you can see from the example is just a Python iterator. Like all iterators it is "wasting", meaning that, unlike a Python list it will be completely used up and empty after all the elements have been retrieved.

Like any iterator an OsidList object can be cast as a more persistent Python list, like so:

```
banks = list(obls.objective_banks)
```

Which is useful if the consuming application needs to keep it around for a while. However, when we start dealing with OsidLists from service implementations which may return very large result sets, or where the underlying data changes often, casting as a list may not be wise. Developers are encouraged to treat these as iterators to the extent possible, and refresh from the session as necessary.

You can also inspect the number of available elements in the expected way:

```
len(obls.objective_banks)
    # or
banks = obls.objective_banks
len(banks)
```

And walk through the list one-at-a-time, in for statements, or by calling next ():

```
banks = lm.objective_banks
crosslinks_bank = banks.next() # At the time of this writing, Crosslinks was first
chem_bridge_bank = banks.next() # and Chemistry Bridge was second
```

## **OSID Ids**

To begin working with OSID *objects*, like ObjectiveBanks it is important to understand how the OSIDs deal with identity. When an OSID object is asked for its id an OSID Id object is returned. This is *not a 'string'*. It is the unique identifier object for the OSID object. Any requests for getting a specific object by its unique identifier will be accomplished through passing this Id object back through the service.

Ids are obtained by calling an OSID object's get\_id() method, which also provides an ident attribute property associated with it for convenience (id is a reserved word in Python so it is not used)

OsidObject.ident	Gets the Id associated with this instance of this OSID ob-
	ject.

So we can try this out:

```
crosslinks_bank_id = crosslinks_bank.ident
chem_bridge_bank_id = chem_bridge_bank.ident
```

Ids can be compared for equality:

```
crosslinks_bank_id == chem_bridge_bank_id
    # should return False
crosslinks_bank_id in [crosslinks_bank_id, chem_bridge_bank_id]
    # should return True
```

If a consumer wishes to persist the identifier then it should serialize the returned Id object, and all Ids can provide a string representation for this purpose:

id\_str\_to\_perist = str(crosslinks\_bank\_id)

A consumer application can also stand up an Id from a persisted string. There is an implementation of the Id primitive object available through the runtime environment for this purpose. For instance, from the dlkit\_django package:

```
from dlkit_django.primordium import Id
crosslinks_bank_id = Id(id_str_to_persist)
```

Once an application has its hands on an Id object it can go ahead and retrieve the corresponding Osid Object through a Lookup Session:

```
crosslinks_bank_redux = obls.get_objective_bank(crosslinks_bank_id)
```

We now have two *different* objects representing the *same* Crosslinks bank, which can be determined by comparing Ids:

```
crosslinks_bank_redux == crosslinks_bank
    # should be False
crosslinks_bank_redux.ident == crosslinks_bank_id
    # should be True
```

## Looking up Objectives

ObjectiveBanks provide methods for looking up and retrieving learning Objectives, in bulk, by Id, or by Type. Some of the more useful methods include:

ObjectiveBank.can_lookup_objectives()	Tests if this user can perform Objective lookups.
ObjectiveBank.objectives	Gets all Objectives.
ObjectiveBank.get_objective(objective_id)	Gets the Objective specified by its Id.
ObjectiveBank.get_objectives_by_genus_t	yp (ets) an ObjectiveList corresponding to the given ob-
	jective genus Type which does not include objectives of
	genus types derived from the specified Type.

So let's try to find an Objective in the Crosslinks bank with a display name of "Definite integral". (Note, that there are also methods for querying Objectives by various attributes. More on that later.):

```
for objective in crosslinks_bank:
    if objective.display_name.text == 'Definite integral':
        def_int_obj = objective
```

Now we have our hands on an honest-to-goodness learning objective as defined by an honest-to-goodness professor at MIT!

### **Authorization Hints**

Many service implementations will require *authentication* and *authorization* for security purposes (*auth/authz*). Authorization checks will be done when the consuming application actually tries to invoke a method for which authz is required, and if its found that the currently logged-in user is not authorized, then the implementation will raise a PermissionDenied error.

However, sometimes its nice to be able to check in advance whether or not the user is likely to be denied access. This way a consuming application can decide, for instance, to hide or "gray out" UI widgets for doing un-permitted functions. This is what the methods like can\_lookup\_objectives are for. They simply return a boolean.

# The Objective Object

Objectives inherit from OsidObjects (ObjectiveBanks do too, by the way), which means there are a few methods they share with all other OsidObjects defined by the specification

OsidObject.display_name	Gets the preferred display name associated with this in- stance of this OSID object appropriate for display to the
	user.
OsidObject.description	Gets the description associated with this instance of this
	OSID object.
OsidObject.genus_type	Gets the genus type of this object.

The display\_name and description attributes work exactly like they did for ObjectiveBanks and both return a Displaytext object that can be interrogated for its text or the format, language, script of the text to be displayed. We'll get to genus\_type in a little bit

Additionally Objectives objects can hold some information particular to the kind of data that they manage:

Objective.has_assessment()	Tests if an assessment is associated with this objective.
Objective.assessment	Gets the assessment associated with this learning objective.
Objective.assessment_id	Gets the assessment Id associated with this learning objec-
	tive.
Objective.has_cognitive_process()	Tests if this objective has a cognitive process type.
Objective.cognitive_process	Gets the grade associated with the cognitive process.
Objective.cognitive_process_id	Gets the grade Id associated with the cognitive process.
Objective.has_knowledge_category()	Tests if this objective has a knowledge dimension.
Objective.knowledge_category	Gets the grade associated with the knowledge dimension.
Objective.knowledge_category_id	Gets the grade Id associated with the knowledge dimen-
	sion.

# **OSID Types**

The OSID specification defines Types as a way to indicate additional agreements between service consumers and service providers. A Type is similar to an Id but includes other data for display and organization:

Type.display_name	Gets the full display name of this Type.
Type.display_label	Gets the shorter display label for this Type.
Type.description	Gets a description of this Type.
Type.domain	Gets the domain.

Types also include identification elements so as to uniquely identify one Type from another:

Type.authority	Gets the authority of this Type.
<i>Type.namespace</i>	Gets the namespace of the identifier.
Type.identifier	Gets the identifier of this Type.

Consuming applications will often need to persist Types for future use. Persisting a type reference requires persisting all three of these identification elements.

For instance the MC3 service implementation supports two different types of Objectives, which help differentiate between *topic* type objectives and *learning outcome* type objectives. One way to store, say, the topic type for future

programmatic reference might be to put it in a dict:

```
OBJECTIVE_TOPIC_TYPE = {
    'authority': 'MIT-OEIT',
    'namespace': 'mc3-objective',
    'identifier': 'mc3.learning.topic'
}
```

The OSIDs also specify functions for looking up types that are defined and/or supported, and as one might imagine, there is TypeLookupSession specifically designed for this purpose. This session, however, is not defined in the *learning* service package, it is found in the *type* package, which therefore requires a TypeManager be instantiated:

```
tm = runtime.get_service_manager('LEARNING', <proxy>)
...
if tm.supports_type_lookup():
    tls = tm.get_type_lookup_session()
```

The TypeLookupSession provides a number of ways to get types, two of which are sufficient to get started:

TypeLookupSession.types	Gets all the known Types.
TypeLookupSession.get_type(namespace,)	Gets a Type by its string representation which is a combi-
	nation of the authority and identifier.

For kicks, let's print a list of all the Types supported by the implementation:

```
for typ in tls.types:
    print typ.display_label.text
# For the MC3 implementation this should result in a very long list
```

Also, we can pass the dict we created earlier to the session to get the actual Type object representing the three identification elements we persisted:

```
topic_type = tls.get_type(**OBJECTIVE_TOPIC_TYPE)
print topic_type.display_label.text + ': ' + topic_type.description.text
```

# This should print the string 'Topic: Objective that represents a learning topic'

(More to come)

# Assessment

### Summary

Assessment Open Service Interface Definitions assessment version 3.0.0

The Assessment OSID provides the means to create, access, and take assessments. An Assessment may represent a quiz, survey, or other evaluation that includes assessment Items. The OSID defines methods to describe the flow of control and the relationships among the objects. Assessment Items are extensible objects to capture various types of questions, such as a multiple choice or an asset submission.

The Assessment service can br broken down into several distinct services:

• Assessment Taking

- Assessment and Item authoring
- · Accessing and managing banks of assessments and items

Each of these service areas are covered by different session and object interfaces. The object interfaces describe both the structure of the assessment and follow an assessment management workflow of first defining assessment items and then authoring assessments based on those items. They are:

- Item: a question and answer pair
- Response: a response to an Item question
- Assessment : a set of Items
- AssessmentSection: A grouped set of Items
- AssessmentOffering: An Assessment available for taking
- AssessmentTaken: An AssessmentOffering that has been completed or in progress

#### Taking Assessments

The AssessmentSession is used to take an assessment. It captures various ways an assessment can be taken which may include time constraints, the ability to suspend and resume, and the availability of an answer.

Taking an Assessment involves first navigating through AssessmentSections. An AssessmentSection is an advanced authoring construct used to both visually divide an Assessment and impose additional constraints. Basic assessments are assumed to always have one AssessmentSection even if not explicitly created.

#### Authoring

A basic authoring session is available in this package to map Items to Assessments. More sophisticated authoring using AssessmentParts and sequencing is available in the Assessment Authoring OSID.

#### Bank Cataloging

Assessments, AssessmentsOffered, AssessmentsTaken, and Items may be organized into federateable catalogs called Banks.

#### Sub Packages

The Assessment OSID includes an Assessment Authoring OSID for more advanced authoring and sequencing options. Assessment Open Service Interface Definitions assessment version 3.0.0

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### Service Managers

#### **Assessment Profile**

class dlkit.services.assessment.AssessmentProfile

Bases: dlkit.osid.managers.OsidProfile

The AssessmentProfile describes the interoperability among assessment services.

#### supports\_assessment()

Tests for the availability of a assessment service which is the service for taking and examining assessments taken.

Returns true if assessment is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_assessment\_results()

Tests for the availability of an assessment rsults service.

**Returns** true if assessment results is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_item\_lookup()

Tests if an item lookup service is supported.

**Returns** true if item lookup is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_item\_query()

Tests if an item query service is supported.

Returns true if item query is supported, false otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

#### supports\_item\_search()

Tests if an item search service is supported.

**Returns** true if item search is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_item\_admin()

Tests if an item administrative service is supported.

**Returns** true if item admin is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_item\_notification()

Tests if item notification is supported.

Messages may be sent when items are created, modified, or deleted.

**Returns** true if item notification is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_item\_bank()

Tests if an item to bank lookup session is available.

**Returns** true if item bank lookup session is supported, false otherwise

**Return type** boolean

compliance: mandatory – This method must be implemented.

#### supports\_item\_bank\_assignment()

Tests if an item to bank assignment session is available.

**Returns** true if item bank assignment is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_assessment\_lookup()

Tests if an assessment lookup service is supported.

An assessment lookup service defines methods to access assessments.

**Returns** true if assessment lookup is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_assessment\_query()

Tests if an assessment query service is supported.

**Returns** true if assessment query is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_assessment\_admin()

Tests if an assessment administrative service is supported.

**Returns** true if assessment admin is supported, false otherwise

**Return type** boolean

compliance: mandatory – This method must be implemented.

#### supports\_assessment\_bank()

Tests if an assessment to bank lookup session is available.

Returns true if assessment bank lookup session is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_assessment\_bank\_assignment()

Tests if an assessment to bank assignment session is available.

Returns true if assessment bank assignment is supported, false otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

#### supports\_assessment\_basic\_authoring()

Tests if an assessment basic authoring session is available.

**Returns** true if assessment basic authoring is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_assessment\_offered\_lookup()

Tests if an assessment offered lookup service is supported.

Returns true if assessment offered lookup is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_assessment\_offered\_query()

Tests if an assessment offered query service is supported.

**Returns** true if assessment offered query is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_assessment\_offered\_admin()

Tests if an assessment offered administrative service is supported.

**Returns** true if assessment offered admin is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_assessment\_offered\_bank()

Tests if an assessment offered to bank lookup session is available.

Returns true if assessment offered bank lookup session is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_assessment\_offered\_bank\_assignment()

Tests if an assessment offered to bank assignment session is available.

Returns true if assessment offered bank assignment is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_assessment\_taken\_lookup()

Tests if an assessment taken lookup service is supported.

Returns true if assessment taken lookup is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_assessment\_taken\_query()

Tests if an assessment taken query service is supported.

**Returns** true if assessment taken query is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_assessment\_taken\_admin()

Tests if an assessment taken administrative service is supported which is used to instantiate an assessment offered.

**Returns** true if assessment taken admin is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_assessment\_taken\_bank()

Tests if an assessment taken to bank lookup session is available.

**Returns** true if assessment taken bank lookup session is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_assessment\_taken\_bank\_assignment()

Tests if an assessment taken to bank assignment session is available.

**Returns** true if assessment taken bank assignment is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_bank\_lookup()

Tests if a bank lookup service is supported.

A bank lookup service defines methods to access assessment banks.

Returns true if bank lookup is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_bank\_query()

Tests if a bank query service is supported.

**Returns** true if bank query is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_bank\_admin()

Tests if a banlk administrative service is supported.

Returns true if bank admin is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_bank\_hierarchy()

Tests if a bank hierarchy traversal is supported.

Returns true if a bank hierarchy traversal is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_bank\_hierarchy\_design()

Tests if bank hierarchy design is supported.

**Returns** true if a bank hierarchy design is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### item\_record\_types

Gets the supported Item record types.

**Returns** a list containing the supported Item record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### item\_search\_record\_types

Gets the supported Item search record types.

Returns a list containing the supported Item search record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### assessment\_record\_types

Gets the supported Assessment record types.

Returns a list containing the supported Assessment record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### assessment\_search\_record\_types

Gets the supported Assessment search record types.

Returns a list containing the supported assessment search record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### assessment\_offered\_record\_types

Gets the supported AssessmentOffered record types.

**Returns** a list containing the supported AssessmentOffered record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### assessment\_offered\_search\_record\_types

Gets the supported AssessmentOffered search record types.

**Returns** a list containing the supported AssessmentOffered search record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### assessment\_taken\_record\_types

Gets the supported AssessmentTaken record types.

Returns a list containing the supported AssessmentTaken record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### assessment\_taken\_search\_record\_types

Gets the supported AssessmentTaken search record types.

**Returns** a list containing the supported AssessmentTaken search record types

Return type osid.type.TypeList

*compliance: mandatory – This method must be implemented.* 

#### assessment\_section\_record\_types

Gets the supported AssessmentSection record types.

Returns a list containing the supported AssessmentSection record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### bank\_record\_types

Gets the supported Bank record types.

Returns a list containing the supported Bank record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### bank\_search\_record\_types

Gets the supported bank search record types.

Returns a list containing the supported Bank search record types

**Return type** osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### Assessment Manager

```
class dlkit.services.assessment.AssessmentManager (proxy=None)
```

**Bases:** dlkit.osid.managers.OsidManager, dlkit.osid.sessions.OsidSession, *dlkit.services.assessment.AssessmentProfile* 

The assessment manager provides access to assessment sessions and provides interoperability tests for various aspects of this service.

The sessions included in this manager are:

•MyAssessmentTakenSession: a session to get taken or in progress assessments for the current agent

•AssessmentSession: a session to be assessed and examine assessments taken

•AssessmentResultsSession: a session to retrieve assessment results

- •ItemLookupSession: a session to look up Items
- •ItemQuerySession : a session to query Items
- •ItemSearchSession: a session to search Items
- •ItemAdminSession: a session to create, modify and delete Items
- •ItemNotificationSession: a session to receive messages pertaining to Item changes
- •ItemBankSession: a session for looking up item and bank mappings
- •ItemBankAssignmentSession: a session for managing item and bank mappings
- •ItemSmartBankSession: a session for managing dynamic banks
- •AssessmentLookupSession: a session to look up Assessments
- •AssessmentQuerySession: a session to query Assessments
- •AssessmentSearchSession: a session to search Assessments
- •AssessmentAdminSession: a session to create, modify and delete Assessments
- •AssessmentNotificationSession: a session to receive messages pertaining to Assessment changes
- •AssessmentBankSession: a session for looking up assessment and bank mappings
- •AssessmentBankAssignmentSession: a session for managing assessment and bank mappings
- •AssessmentSmartBankSession: a session for managing dynamic banks
- •AssessmentBasicAuthoringSession: a session for making simple mappings of assessment items to assessments
- •AssessmentOfferedLookupSession: a session to look up AssessmentsOffered
- •AssessmentOfferedQuerySession: a session to query AssessmentsOffered
- •AssessmentOfferedSearchSession: a session to search AssessmentsOffered
- •AssessmentOfferedAdminSession: a session to create, modify and delete AssessmentsOffered
- •AssessmentOfferedNotificationSession: a session to receive messages pertaining to AssessmentOffered changes

•AssessmentOfferedBankSession: a session for looking up assessments offered and bank mappings

•AssessmentOfferedBankAssignmentSession: a session for managing assessments offered and bank mappings

•AssessmentOfferedSmartBankSession : a session to manage dynamic banks of assessments offered

•AssessmentTakenLookupSession: a session to look up Assessments

•AssessmentTakenQuerySession: a session to query Assessments

•AssessmentTakenSearchSession: a session to search Assessments

•AssessmentTakenAdminSession: a session to create, modify and delete AssessmentsTaken

•AssessmentTakenNotificationSession: a session to receive messages pertaining to AssessmentTaken changes

•AssessmentTakenBankSession: a session for looking up assessments taken and bank mappings

•AssessmenttTakenBankAssignmentSession: a session for managing assessments taken and bank mappings

•AssessmentTakenSmartBankSession: a session to manage dynamic banks of assessments taken

•BankLookupSession: a session to lookup banks

•BankQuerySession : a session to query banks

•BankSearchSession: a session to search banks

•BankAdminSession : a session to create, modify and delete banks

•BankNotificationSession : a session to receive messages pertaining to Bank changes

•BankHierarchySession: a session to traverse the Bank hierarchy

•BankHierarchyDesignSession : a session to manage the Bank hierarchy

#### assessment\_authoring\_manager

Gets an AssessmentAuthoringManager.

Returns an AssessmentAuthoringManager

Return type osid.assessment.authoring.AssessmentAuthoringManager

Raise OperationFailed - unable to complete request

**Raise** Unimplemented - supports\_assessment\_authoring() is false

compliance: optional – This method must be implemented if "supports\_assessment\_authoring()" is true.

#### assessment\_batch\_manager

Gets an AssessmentBatchManager.

**Returns** an AssessmentBatchManager

Return type osid.assessment.batch.AssessmentBatchManager

**Raise** OperationFailed – unable to complete request

Raise Unimplemented-supports\_assessment\_batch() is false

compliance: optional – This method must be implemented if ''supports\_assessment\_batch()'' is true.

#### **Bank Lookup Methods**

```
AssessmentManager.can_lookup_banks()
```

Tests if this user can perform Bank lookups.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

Returns false if lookup methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
AssessmentManager.use_comparative_bank_view()
```

The returns from the bank methods may omit or translate elements based on this session, such as assessment, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

```
AssessmentManager.use_plenary_bank_view()
```

A complete view of the Hierarchy returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

AssessmentManager.get\_bank(bank\_id)

Gets the Bank specified by its Id.

In plenary mode, the exact Id is found or a NotFound results. Otherwise, the returned Bank may have a different Id than requested, such as the case where a duplicate Id was assigned to a Bank and retained for compatibility.

Parameters bank\_id (osid.id.Id) - Id of the Bank

Returns the bank

Return type osid.assessment.Bank

Raise NotFound - bank\_id not found

**Raise** NullArgument - bank\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method is must be implemented.

AssessmentManager.get\_banks\_by\_ids (*bank\_ids*) Gets a BankList corresponding to the given IdList.

In plenary mode, the returned list contains all of the banks specified in the Id list, in the order of the list, including duplicates, or an error results if an Id in the supplied list is not found or inaccessible. Otherwise, inaccessible Bank objects may be omitted from the list and may present the elements in any order including returning a unique set.

Parameters bank\_ids (osid.id.IdList) - the list of Ids to retrieve

Returns the returned Bank list

Return type osid.assessment.BankList

Raise NotFound - an Id was not found

**Raise** NullArgument - bank\_ids is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

AssessmentManager.get\_banks\_by\_genus\_type(bank\_genus\_type)

Gets a BankList corresponding to the given bank genus Type which does not include banks of types derived from the specified Type.

In plenary mode, the returned list contains all known banks or an error results. Otherwise, the returned list may contain only those banks that are accessible through this session.

**Parameters bank\_genus\_type** (osid.type.Type) - a bank genus type

Returns the returned Bank list

Return type osid.assessment.BankList

Raise NullArgument - bank\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

AssessmentManager.get\_banks\_by\_parent\_genus\_type(bank\_genus\_type)

Gets a BankList corresponding to the given bank genus Type and include any additional banks with genus types derived from the specified Type.

In plenary mode, the returned list contains all known banks or an error results. Otherwise, the returned list may contain only those banks that are accessible through this session.

**Parameters bank\_genus\_type** (osid.type.Type) - a bank genus type

Returns the returned Bank list

Return type osid.assessment.BankList

**Raise** NullArgument - bank\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

AssessmentManager.get\_banks\_by\_record\_type (bank\_record\_type) Gets a BankList containing the given bank record Type.

In plenary mode, the returned list contains all known banks or an error results. Otherwise, the returned list may contain only those banks that are accessible through this session.

**Parameters bank\_record\_type** (osid.type.Type) - a bank record type

Returns the returned Bank list

Return type osid.assessment.BankList

Raise NullArgument - bank\_record\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

AssessmentManager.get\_banks\_by\_provider (*resource\_id*) Gets a BankList from the given provider "".

In plenary mode, the returned list contains all known banks or an error results. Otherwise, the returned list may contain only those banks that are accessible through this session.

Parameters resource\_id (osid.id.Id) - a resource Id

Returns the returned Bank list

Return type osid.assessment.BankList

**Raise** NullArgument - resource\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

#### AssessmentManager.banks

Gets all Banks.

In plenary mode, the returned list contains all known banks or an error results. Otherwise, the returned list may contain only those banks that are accessible through this session.

**Returns** a BankList

Return type osid.assessment.BankList

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

#### **Bank Query Methods**

```
AssessmentManager.can_search_banks()
```

Tests if this user can perform Bank searches.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer search operations to unauthorized users.

Returns false if search methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

AssessmentManager.bank\_query

Gets a bank query.

Returns a bank query

Return type osid.assessment.BankQuery

compliance: mandatory – This method must be implemented.

AssessmentManager.get\_banks\_by\_query (*bank\_query*) Gets a list of Bank objects matching the given bank query. Parameters bank\_query (osid.assessment.BankQuery) - the bank query

Returns the returned BankList

Return type osid.assessment.BankList

Raise NullArgument - bank\_query is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

**Raise** Unsupported – bank\_query is not of this service

compliance: mandatory – This method must be implemented.

#### **Bank Admin Methods**

AssessmentManager.can\_create\_banks()

Tests if this user can create Banks.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating a Bank will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer create operations to unauthorized users.

Returns false if Bank creation is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

AssessmentManager.can\_create\_bank\_with\_record\_types (bank\_record\_types) Tests if this user can create a single Bank using the desired record types.

While AssessmentManager.getBankRecordTypes() can be used to examine which records are supported, this method tests which record(s) are required for creating a specific Bank. Providing an empty array tests if a Bank can be created with no records.

- Parameters bank\_record\_types (osid.type.Type[]) array of bank record
  types
- **Returns** true if Bank creation using the specified Types is supported, false otherwise

Return type boolean

**Raise** NullArgument - bank\_record\_types is null

compliance: mandatory – This method must be implemented.

AssessmentManager.get\_bank\_form\_for\_create (*bank\_record\_types*) Gets the bank form for creating new banks.

A new form should be requested for each create transaction.

**Parameters bank\_record\_types** (osid.type.Type[]) – array of bank record types to be included in the create operation or an empty list if none

**Returns** the bank form

Return type osid.assessment.BankForm

**Raise** NullArgument - bank\_record\_types is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

**Raise** Unsupported – unable to get form for requested record types

compliance: mandatory – This method must be implemented.

AssessmentManager.create\_bank(bank\_form)

Creates a new Bank.

Parameters bank\_form (osid.assessment.BankForm) - the form for this Bank

Returns the new Bank

Return type osid.assessment.Bank

Raise IllegalState - bank\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

**Raise** NullArgument - bank\_form is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

**Raise** Unsupported – bank\_form did not originate from get\_bank\_form\_for\_create()

compliance: mandatory – This method must be implemented.

AssessmentManager.can\_update\_banks()

Tests if this user can update Banks.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating a Bank will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer update operations to unauthorized users.

Returns false if Bank modification is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

AssessmentManager.get\_bank\_form\_for\_update (*bank\_id*) Gets the bank form for updating an existing bank.

A new bank form should be requested for each update transaction.

Parameters bank\_id (osid.id.Id) - the Id of the Bank

Returns the bank form

Return type osid.assessment.BankForm

Raise NotFound - bank\_id is not found

Raise NullArgument - bank\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

```
AssessmentManager.update_bank(bank_form)
```

Updates an existing bank.

**Parameters bank\_form** (osid.assessment.BankForm) – the form containing the elements to be updated

**Raise** IllegalState – bank\_form already used in an update transaction

**Raise** InvalidArgument – the form contains an invalid value

Raise NullArgument - bank\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

**Raise** Unsupported – bank\_form did not originate from get\_bank\_form\_for\_update()

compliance: mandatory – This method must be implemented.

#### AssessmentManager.can\_delete\_banks()

Tests if this user can delete banks.

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting a Bank will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer delete operations to unauthorized users.

Returns false if Bank deletion is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### AssessmentManager.delete\_bank(bank\_id)

Deletes a Bank.

**Parameters bank\_id** (osid.id.Id) – the Id of the Bank to remove

Raise NotFound - bank\_id not found

Raise NullArgument - bank\_id is null

Raise OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

#### AssessmentManager.can\_manage\_bank\_aliases()

Tests if this user can manage Id aliases for Banks.

A return of true does not guarantee successful authorization. A return of false indicates that it is known changing an alias will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer alias operations to an unauthorized user.

**Returns** false if Bank aliasing is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

AssessmentManager.alias\_bank(bank\_id, alias\_id)

Adds an Id to a Bank for the purpose of creating compatibility.

The primary Id of the Bank is determined by the provider. The new Id is an alias to the primary Id. If the alias is a pointer to another bank, it is reassigned to the given bank Id.

#### Parameters

- **bank\_id** (osid.id.Id) the Id of a Bank
- alias\_id (osid.id.Id) the alias Id

Raise AlreadyExists - alias\_id is in use as a primary Id
Raise NotFound - bank\_id not found
Raise NullArgument - bank\_id or alias\_id is null
Raise OperationFailed - unable to complete request
Raise PermissionDenied - authorization failure occurred
compliance: mandatory - This method must be implemented.

## **Bank Hierarchy Methods**

AssessmentManager.bank\_hierarchy\_id

Gets the hierarchy Id associated with this session.

Returns the hierarchy Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

## AssessmentManager.bank\_hierarchy

Gets the hierarchy associated with this session.

Returns the hierarchy associated with this session

**Return type** osid.hierarchy.Hierarchy

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – assessment failure

compliance: mandatory – This method must be implemented.

AssessmentManager.can\_access\_bank\_hierarchy() Tests if this user can perform hierarchy queries.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations.

Returns false if hierarchy traversal methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## AssessmentManager.use\_comparative\_bank\_view()

The returns from the bank methods may omit or translate elements based on this session, such as assessment, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

## AssessmentManager.use\_plenary\_bank\_view()

A complete view of the Hierarchy returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

AssessmentManager.root\_bank\_ids Gets the root bank Ids in this hierarchy.

Returns the root bank Ids

Return type osid.id.IdList

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

#### AssessmentManager.root\_banks

Gets the root banks in this bank hierarchy.

**Returns** the root banks

Return type osid.assessment.BankList

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method is must be implemented.

AssessmentManager.has\_parent\_banks(bank\_id)

Tests if the Bank has any parents.

Parameters bank\_id(osid.id.Id) - a bank Id

**Returns** true if the bank has parents, false otherwise

Return type boolean

**Raise** NotFound – bank\_id is not found

Raise NullArgument - bank\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

AssessmentManager.**is\_parent\_of\_bank** (*id\_, bank\_id*) Tests if an Id is a direct parent of a bank.

#### **Parameters**

- id (osid.id.Id) an Id
- **bank\_id** (osid.id.Id) the Id of a bank

**Returns** true if this id is a parent of bank\_id, false otherwise

Return type boolean

**Raise** NotFound – bank\_id is not found

Raise NullArgument - id or bank\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

*compliance: mandatory – This method must be implemented. implementation notes:* If id not found return false.

AssessmentManager.get\_parent\_bank\_ids (bank\_id) Gets the parent Ids of the given bank.

Parameters bank\_id(osid.id.Id) - a bank Id

Returns the parent Ids of the bank

Return type osid.id.IdList

**Raise** NotFound – bank\_id is not found

Raise NullArgument - bank\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

*compliance: mandatory – This method must be implemented.* 

AssessmentManager.get\_parent\_banks(bank\_id)

Gets the parents of the given bank.

Parameters bank\_id (osid.id.Id) - a bank Id

**Returns** the parents of the bank

Return type osid.assessment.BankList

Raise NotFound - bank\_id is not found

Raise NullArgument - bank\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

AssessmentManager.**is\_ancestor\_of\_bank** (*id\_, bank\_id*) Tests if an Id is an ancestor of a bank.

#### **Parameters**

- id (osid.id.Id) an Id
- bank\_id (osid.id.Id) the Id of a bank

**Returns** true if this id is an ancestor of bank\_id, false otherwise

Return type boolean

Raise NotFound - bank\_id is not found

**Raise** NullArgument - bank\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented. implementation notes:* If id not found return false.

AssessmentManager.has\_child\_banks(bank\_id) Tests if a bank has any children.

Parameters bank\_id (osid.id.Id) - a bank\_id

**Returns** true if the bank\_id has children, false otherwise

Return type boolean

Raise NotFound - bank\_id is not found

**Raise** NullArgument - bank\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

AssessmentManager.**is\_child\_of\_bank** (*id\_, bank\_id*) Tests if a bank is a direct child of another.

## Parameters

- id (osid.id.Id) an Id
- bank\_id (osid.id.Id) the Id of a bank

Returns true if the id is a child of bank\_id, false otherwise

Return type boolean

Raise NotFound - bank\_id not found

**Raise** NullArgument - bank\_id or id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

*compliance: mandatory – This method must be implemented. implementation notes*: If id not found return false.

AssessmentManager.get\_child\_bank\_ids(bank\_id)

Gets the child Ids of the given bank.

Parameters bank\_id (osid.id.Id) - the Id to query

**Returns** the children of the bank

Return type osid.id.IdList

Raise NotFound - bank\_id is not found

Raise NullArgument - bank\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

AssessmentManager.get\_child\_banks (bank\_id) Gets the children of the given bank.

Parameters bank\_id (osid.id.Id) - the Id to query

Returns the children of the bank

Return type osid.assessment.BankList

Raise NotFound - bank\_id is not found

Raise NullArgument - bank\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

AssessmentManager.is\_descendant\_of\_bank(id\_, bank\_id)

Tests if an Id is a descendant of a bank.

## Parameters

- id (osid.id.Id) an Id
- **bank\_id** (osid.id.Id) the Id of a bank

Returns true if the id is a descendant of the bank\_id, false otherwise

Return type boolean

Raise NotFound - bank\_id not found

**Raise** NullArgument - bank\_id or id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented. implementation notes*: If id is not found return false.

AssessmentManager.get\_bank\_node\_ids (bank\_id, ancestor\_levels, descendant\_levels,

*include\_siblings*) Gets a portion of the hierarchy for the given bank.

Parameters

- - **bank\_id** (osid.id.Id) the Id to query
  - **ancestor\_levels** (cardinal) the maximum number of ancestor levels to include. A value of 0 returns no parents in the node.
  - **descendant\_levels** (cardinal) the maximum number of descendant levels to include. A value of 0 returns no children in the node.
  - **include\_siblings** (boolean) true to include the siblings of the given node, false to omit the siblings

#### Returns a bank node

Return type osid.hierarchy.Node

Raise NotFound - bank\_id is not found

**Raise** NullArgument - bank\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented.* 

AssessmentManager.get\_bank\_nodes (bank\_id, ancestor\_levels, descendant\_levels, in-

clude\_siblings)

Gets a portion of the hierarchy for the given bank.

## Parameters

- **bank\_id** (osid.id.Id) the Id to query
- **ancestor\_levels** (cardinal) the maximum number of ancestor levels to include. A value of 0 returns no parents in the node.

- **descendant\_levels** (cardinal) the maximum number of descendant levels to include. A value of 0 returns no children in the node.
- include\_siblings (boolean) true to include the siblings of the given node, false to omit the siblings

## Returns a bank node

Return type osid.assessment.BankNode

Raise NotFound - bank\_id is not found

Raise NullArgument - bank\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## **Bank Hierarchy Design Methods**

```
AssessmentManager.bank_hierarchy_id
```

Gets the hierarchy Id associated with this session.

**Returns** the hierarchy Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

## AssessmentManager.bank\_hierarchy

Gets the hierarchy associated with this session.

**Returns** the hierarchy associated with this session

Return type osid.hierarchy.Hierarchy

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – assessment failure

compliance: mandatory – This method must be implemented.

## AssessmentManager.can\_modify\_bank\_hierarchy()

Tests if this user can change the hierarchy.

A return of true does not guarantee successful authorization. A return of false indicates that it is known performing any update will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer these operations to an unauthorized user.

**Returns** false if changing this hierarchy is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

AssessmentManager.add\_root\_bank (bank\_id) Adds a root bank.

Parameters bank\_id (osid.id.Id) - the Id of a bank

Raise AlreadyExists - bank\_id is already in hierarchy

Raise NotFound - bank\_id not found

**Raise** NullArgument - bank\_id is null

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

AssessmentManager.remove\_root\_bank (*bank\_id*) Removes a root bank from this hierarchy.

**Parameters bank\_id** (osid.id.Id) – the Id of a bank

Raise NotFound - bank\_id not a parent of child\_id

Raise NullArgument - bank\_id or child\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

AssessmentManager.add\_child\_bank (*bank\_id*, *child\_id*) Adds a child to a bank.

#### **Parameters**

- bank\_id (osid.id.Id) the Id of a bank
- child\_id (osid.id.Id) the Id of the new child

Raise AlreadyExists - bank\_id is already a parent of child\_id

Raise NotFound - bank\_id or child\_id not found

Raise NullArgument - bank\_id or child\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

AssessmentManager.remove\_child\_bank (*bank\_id*, *child\_id*) Removes a child from a bank.

#### **Parameters**

• bank\_id (osid.id.Id) - the Id of a bank

• child\_id (osid.id.Id) - the Id of the new child

Raise NotFound - bank\_id not parent of child\_id

Raise NullArgument - bank\_id or child\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

AssessmentManager.**remove\_child\_banks**(*bank\_id*) Removes all children from a bank.

Parameters bank\_id (osid.id.Id) - the Id of a bank

Raise NotFound - bank\_id is not in hierarchy

Raise NullArgument - bank\_id is null

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

# **Bank**

## Bank

```
class dlkit.services.assessment.Bank (provider_manager, catalog, runtime, proxy, **kwargs)
Bases: dlkit.osid.objects.OsidCatalog, dlkit.osid.sessions.OsidSession
```

A bank defines a collection of assessments and items.

## get\_bank\_record(bank\_record\_type)

Gets the bank record corresponding to the given Bank record Type.

This method is used to retrieve an object implementing the requested record. The <code>bank\_record\_type</code> may be the Type returned in get\_record\_types() or any of its parents in a Type hierarchy where <code>has\_record\_type(bank\_record\_type)</code> is true.

Parameters bank\_record\_type (osid.type.Type) - a bank record type

Returns the bank record

Return type osid.assessment.records.BankRecord

Raise NullArgument - bank\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type (bank\_record\_type) is false

compliance: mandatory – This method must be implemented.

# **Assessment Methods**

#### Bank.bank\_id

Gets the Bank Id associated with this session.

Returns the Bank Id associated with this session

Return type osid.id.Id

*compliance: mandatory – This method must be implemented.* 

## Bank.bank

Gets the Bank associated with this session.

Returns the Bank associated with this session

Return type osid.assessment.Bank

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

#### Bank.can\_take\_assessments()

Tests if this user can take this assessment section.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer assessment operations to unauthorized users.

Returns false if assessment methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
Bank.has_assessment_begun (assessment_taken_id)
```

Tests if this assessment has started.

An assessment begins from the designated start time if a start time is defined. If no start time is defined the assessment may begin at any time. Assessment sections cannot be accessed if the return for this method is false.

**Parameters assessment\_taken\_id** (osid.id.Id) - Id of the AssessmentTaken

**Returns** true if this assessment has begun, false otherwise

Return type boolean

**Raise** NotFound-assessment\_taken\_id is not found

**Raise** NullArgument - assessment\_taken\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

```
Bank.is_assessment_over(assessment_taken_id)
```

Tests if this assessment is over.

An assessment is over if finished\_assessment() is invoked or the designated finish time has expired.

**Parameters assessment\_taken\_id** (osid.id.Id) - Id of the AssessmentTaken

Returns true if this assessment is over, false otherwise

Return type boolean

Raise NotFound-assessment\_taken\_id is not found

**Raise** NullArgument - assessment\_taken\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

## Bank.requires\_synchronous\_sections (assessment\_taken\_id)

Tests if synchronous sections are required.

This method should be checked to determine if all sections are available when requested, or the next sections becomes available only after the previous section is complete.

There are two methods for retrieving sections. One is using the built-in hasNextSection() and get-NextSection() methods. In synchronous mode, hasNextSection() is false until the current section is completed. In asynchronous mode, has\_next\_section() returns true until the end of the assessment.

AssessmentSections may also be accessed via an AssessmentSectionList. If syncronous sections are required, AssessmentSectionList.available() == 0 and AssessmentSectionList.getNextQuestion() blocks until the section is complete. AssessmentSectionList.hasNext() is always true until the end of the assessment is reached.

Parameters assessment\_taken\_id (osid.id.Id) - Id of the AssessmentTaken

**Returns** true if this synchronous sections are required, false otherwise

Return type boolean

**Raise** NotFound-assessment\_taken\_id is not found

Raise NullArgument - assessment\_taken\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

```
Bank.get_first_assessment_section (assessment_taken_id)
```

Gets the first assessment section in this assessment.

All assessments have at least one AssessmentSection.

Parameters assessment\_taken\_id (osid.id.Id) - Id of the AssessmentTaken

Returns the first assessment section

Return type osid.assessment.AssessmentSection

Raise IllegalState - has\_assessment\_begun() is false

Raise NotFound-assessment\_taken\_id is not found

**Raise** NullArgument - assessment\_taken\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.has\_next\_assessment\_section (assessment\_section\_id)

Tests if there is a next assessment section in the assessment following the given assessment section Id.

**Parameters assessment\_section\_id** (osid.id.Id) - Id of the AssessmentSection

**Returns** true if there is a next section, false otherwise

Return type boolean

Raise IllegalState - has\_assessment\_begun() is false

**Raise** NotFound - assessment\_taken\_id is not found

**Raise** NullArgument - assessment\_taken\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.get\_next\_assessment\_section (assessment\_section\_id) Gets the next assessemnt section following the given assessment section.

**Parameters assessment\_section\_id** (osid.id.Id) - Id of the AssessmentSection

**Returns** the next section

Return type osid.assessment.AssessmentSection

Raise IllegalState - has\_next\_assessment\_section() is false

Raise NotFound-assessment\_section\_id is not found

**Raise** NullArgument - assessment\_section\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

#### Bank.has\_previous\_assessment\_section (assessment\_section\_id)

Tests if there is a previous assessment section in the assessment following the given assessment section Id.

**Parameters assessment\_section\_id** (osid.id.Id) - Id of the AssessmentSection

**Returns** true if there is a previous assessment section, false otherwise

Return type boolean

**Raise** IllegalState - has\_assessment\_begun() is false

Raise NotFound-assessment\_section\_id is not found

Raise NullArgument - assessment\_section\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

*compliance: mandatory – This method must be implemented.* 

Bank.get\_previous\_assessment\_section (assessment\_section\_id) Gets the next assessemnt section following the given assessment section.

Parameters assessment\_section\_id (osid.id.Id) - Id of the AssessmentSection

**Returns** the previous assessment section

**Return type** osid.assessment.AssessmentSection

**Raise** IllegalState - has\_next\_assessment\_section() is false

Raise NotFound-assessment\_section\_id is not found

**Raise** NullArgument - assessment\_section\_id is null

**Raise** PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.get\_assessment\_section (assessment\_section\_id) Gets an assessemnts section by Id.

**Parameters** assessment\_section\_id (osid.id.Id) - Id of the AssessmentSection

**Returns** the assessment section

Return type osid.assessment.AssessmentSection

**Raise** IllegalState - has\_assessment\_begun() is false

**Raise** NotFound-assessment\_section\_id is not found

**Raise** NullArgument - assessment\_section\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

## Bank.get\_assessment\_sections (assessment\_taken\_id)

Gets the assessment sections of this assessment.

Parameters assessment_taken_id	(osid.id.Id)	-	Id	of	the
AssessmentTaken					

Returns the list of assessment sections

Return type osid.assessment.AssessmentSectionList

**Raise** IllegalState - has\_assessment\_begun() is false

**Raise** NotFound-assessment\_taken\_id is not found

**Raise** NullArgument - assessment\_taken\_id is null

Raise OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

```
Bank.is_assessment_section_complete (assessment_section_id)
Tests if the all responses have been submitted to this assessment section.
```

If is\_assessment\_section\_complete() is false, then get\_unanswered\_questions() may return a list of questions that can be submitted.

Parameters assessment\_section\_id (osid.id.Id) - Id of the AssessmentSection

**Returns** true if this assessment section is complete, false otherwise

Return type boolean

Raise IllegalState-is\_assessment\_over() is true

**Raise** NotFound - assessment\_section\_id is not found

**Raise** NullArgument - assessment\_section\_id is null

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Bank.get\_incomplete\_assessment\_sections (*assessment\_taken\_id*) Gets the incomplete assessment sections of this assessment.

Parameters assessment\_taken\_id (osid.id.Id) - Id of the AssessmentTaken

**Returns** the list of incomplete assessment sections

**Return type** osid.assessment.AssessmentSectionList

**Raise** IllegalState - has\_assessment\_begun() is false

Raise NotFound-assessment\_taken\_id is not found

**Raise** NullArgument - assessment\_taken\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

# Bank.has\_assessment\_section\_begun (assessment\_section\_id)

Tests if this assessment section has started.

A section begins from the designated start time if a start time is defined. If no start time is defined the section may begin at any time. Assessment items cannot be accessed or submitted if the return for this method is false.

```
Parameters assessment_section_id (osid.id.Id) - Id of the AssessmentSection
```

**Returns** true if this assessment section has begun, false otherwise

Return type boolean

Raise IllegalState - has\_assessment\_begun() is false or is\_assessment\_over() is true

Raise NotFound-assessment\_section\_id is not found

Raise NullArgument - assessment\_section\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented.* 

Bank.**is\_assessment\_section\_over** (*assessment\_section\_id*) Tests if this assessment section is over.

An assessment section is over if new or updated responses can not be submitted such as the designated finish time has expired.

Parameters assessment\_section\_id (osid.id.Id) - Id of the AssessmentSection

Returns true if this assessment is over, false otherwise

Return type boolean

Raise IllegalState - has\_assessmen\_sectiont\_begun() is false or is\_assessment\_section\_over() is true

Raise NotFound-assessment\_section\_id is not found

Raise NullArgument - assessment\_section\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

```
Bank.requires_synchronous_responses(assessment_section_id)
```

Tests if synchronous responses are required in this assessment section.

This method should be checked to determine if all items are available when requested, or the next item becomes available only after the response to the current item is submitted.

There are two methods for retrieving questions. One is using the built-in has\_next\_question() and get\_next\_question() methods. In synchronous mode, has\_next\_question() is false until the response for the current question is submitted. In asynchronous mode, has\_next\_question() returns true until the end of the assessment.

Questions may also be accessed via a QuestionList. If syncronous responses are required, QuestionList.available() == 0 and QuestionList.getNextQuestion() blocks until the response is submitted. QuestionList.hasNext() is always true until the end of the assessment is reached.

```
Parameters assessment_section_id (osid.id.Id) - Id of the AssessmentSection
```

**Returns** true if this synchronous responses are required, false otherwise

Return type boolean

```
Raise IllegalState - has_assessment_begun() is false or
is_assessment_over() is true
```

Raise NotFound-assessment\_section\_id is not found

Raise NullArgument - assessment\_section\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

```
Bank.get_first_question (assessment_section_id)
Gets the first question in this assessment section.
```

```
Parameters assessment_section_id (osid.id.Id) - Id of the
AssessmentSection
```

**Returns** the first question

Return type osid.assessment.Question

Raise IllegalState - has\_assessment\_section\_begun() is false
 or is\_assessment\_section\_over() is true

Raise NotFound-assessment\_section\_id is not found

**Raise** NullArgument - assessment\_section\_id is null

**Raise** OperationFailed – unable to complete request

*compliance: mandatory – This method must be implemented.* 

Bank.has\_next\_question(assessment\_section\_id, item\_id)

Tests if there is a next question following the given question Id.

#### Parameters

- assessment\_section\_id (osid.id.Id) Id of the AssessmentSection
- item\_id (osid.id.Id) Id of the Item

**Returns** true if there is a next question, false otherwise

Return type boolean

Raise IllegalState - has\_assessment\_section\_begun() is false
 or is\_assessment\_section\_over() is true

**Raise** NotFound - assessment\_section\_id or item\_id is not found, or item\_id not part of assessment\_section\_id

**Raise** NullArgument - assessment\_section\_id or item\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.get\_next\_question (assessment\_section\_id, item\_id) Gets the next question in this assessment section.

#### **Parameters**

- assessment\_section\_id (osid.id.Id) Id of the AssessmentSection
- item\_id (osid.id.Id) Id of the Item

**Returns** the next question

Return type osid.assessment.Question

**Raise** IllegalState - has\_next\_question() is false

**Raise** NotFound - assessment\_section\_id or item\_id is not found, or item\_id not part of assessment\_section\_id

Raise NullArgument - assessment\_section\_id or item\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.has\_previous\_question(assessment\_section\_id, item\_id)

Tests if there is a previous question preceeding the given question Id.

## **Parameters**

- assessment\_section\_id (osid.id.Id) Id of the AssessmentSection
- item\_id (osid.id.Id) Id of the Item

**Returns** true if there is a previous question, false otherwise

Return type boolean

- Raise IllegalState has\_assessment\_section\_begun() is false
   or is\_assessment\_section\_over() is true
- **Raise** NotFound assessment\_section\_id or item\_id is not found, or item\_id not part of assessment\_section\_id

Raise NullArgument - assessment\_section\_id or item\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank .get\_previous\_question (*assessment\_section\_id*, *item\_id*) Gets the previous question in this assessment section.

#### **Parameters**

- assessment\_section\_id (osid.id.Id) Id of the AssessmentSection
- item\_id (osid.id.Id) Id of the Item

Returns the previous question

Return type osid.assessment.Question

Raise IllegalState - has\_previous\_question() is false

**Raise** NotFound - assessment\_section\_id or item\_id is not found, or item\_id not part of assessment\_section\_id

**Raise** NullArgument - assessment\_section\_id or item\_id is null

Raise OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.get\_question(assessment\_section\_id, item\_id)

Gets the Question specified by its Id.

#### Parameters

- assessment\_section\_id (osid.id.Id) Id of the AssessmentSection
- item\_id (osid.id.Id) Id of the Item

Returns the returned Question

Return type osid.assessment.Question

- Raise IllegalState has\_assessment\_section\_begun() is false
   or is\_assessment\_section\_over() is true
- **Raise** NotFound assessment\_section\_id or item\_id is not found, or item\_id not part of assessment\_section\_id

**Raise** NullArgument - assessment\_section\_id or item\_id is null

**Raise** OperationFailed – unable to complete request

the

**Raise** PermissionDenied – authorization failure occurred *compliance: mandatory – This method must be implemented.* Bank.get\_questions (assessment\_section\_id) Gets the questions of this assessment section. Parameters assessment section id (osid.id.Id) -Id of AssessmentSection **Returns** the list of assessment questions Return type osid.assessment.QuestionList **Raise** IllegalState - has\_assessment\_section\_begun() is false or is\_assessment\_section\_over() is true **Raise** NotFound - assessment\_section\_id is not found

Raise NullArgument - assessment\_section\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.get\_response\_form(assessment\_section\_id, item\_id)

Gets the response form for submitting an answer.

## **Parameters**

- assessment section id (osid.id.Id) Id of the AssessmentSection
- item\_id (osid.id.Id) Id of the Item
- Returns an answer form

Return type osid.assessment.AnswerForm

- **Raise** IllegalState has\_assessment\_section\_begun() is false or is\_assessment\_section\_over() is true
- Raise NotFound assessment section id or item id is not found, or item\_id not part of assessment\_section\_id

**Raise** NullArgument - assessment\_section\_id or item\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

*compliance: mandatory – This method must be implemented.* 

Bank.submit\_response(assessment\_section\_id, item\_id, answer\_form)

Submits an answer to an item.

## **Parameters**

- assessment\_section\_id (osid.id.Id) \_ Id of the AssessmentSection
- item\_id (osid.id.Id) Id of the Item
- answer\_form (osid.assessment.AnswerForm) the response

- Raise IllegalState has\_assessment\_section\_begun() is false or is\_assessment\_section\_over() is true
- Raise InvalidArgument one or more of the elements in the form is invalid
- Raise NotFound assessment\_section\_id or item\_id is not found, or item\_id not part of assessment\_section\_id
- Raise NullArgument assessment\_section\_id, item\_id, or answer\_form is null

Raise PermissionDenied – authorization failure

Raise Unsupported - answer\_form is not of this service

compliance: mandatory – This method must be implemented.

Bank.skip\_item(assessment\_section\_id, item\_id)

Skips an item.

#### **Parameters**

- assessment\_section\_id (osid.id.Id) Id of the AssessmentSection
- item\_id (osid.id.Id) Id of the Item
- Raise IllegalState has\_assessment\_section\_begun() is false or is\_assessment\_section\_over() is true
- **Raise** NotFound assessment\_section\_id or item\_id is not found, or item\_id not part of assessment\_section\_id
- **Raise** NullArgument assessment\_section\_id or item\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Bank.is\_question\_answered (assessment\_section\_id, item\_id)

Tests if the given item has a response.

#### **Parameters**

- assessment\_section\_id (osid.id.Id) Id of the AssessmentSection
- item\_id (osid.id.Id) Id of the Item

**Returns** true if this item has a response, false otherwise

#### Return type boolean

- Raise IllegalState has\_assessment\_section\_begun() is false or is\_assessment\_section\_over() is true
- Raise NotFound assessment\_section\_id or item\_id is not found, or item\_id not part of assessment\_section\_id

Raise NullArgument-assessment\_section\_id or item\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Bank.get\_unanswered\_questions (assessment\_section\_id)

Gets the unanswered questions of this assessment section.

Parameters assessment\_section\_id (osid.id.Id) - Id of the AssessmentSection

**Returns** the list of questions with no rsponses

Return type osid.assessment.QuestionList

Raise IllegalState - has\_assessment\_section\_begun() is false
 or is\_assessment\_section\_over() is true

**Raise** NotFound-assessment\_section\_id is not found

**Raise** NullArgument - assessment\_section\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.has\_unanswered\_questions (assessment\_section\_id)

Tests if there are unanswered questions in this assessment section.

Parameters assessment\_section\_id (osid.id.Id) - Id of the AssessmentSection

**Returns** true if there are unanswered questions, false otherwise

Return type boolean

Raise IllegalState - has\_assessment\_section\_begun() is false
 or is\_assessment\_section\_over() is true

**Raise** NotFound - assessment\_section\_id is not found

Raise NullArgument - assessment\_section\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

*compliance: mandatory – This method must be implemented.* 

Bank.get\_first\_unanswered\_question (*assessment\_section\_id*) Gets the first unanswered question in this assessment section.

Parameters assessment\_section\_id (osid.id.Id) - Id of the
AssessmentSection

**Returns** the first unanswered question

Return type osid.assessment.Question

Raise IllegalState - has\_unanswered\_questions() is false

**Raise** NotFound - assessment\_section\_id is not found

Raise NullArgument - assessment\_section\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

*compliance: mandatory – This method must be implemented.* 

Bank **. has\_next\_unanswered\_question** (*assessment\_section\_id*, *item\_id*) Tests if there is a next unanswered question following the given question Id.

#### **Parameters**

- assessment\_section\_id (osid.id.Id) Id of the AssessmentSection
- item\_id (osid.id.Id) Id of the Item

**Returns** true if there is a next unanswered question, false otherwise

Return type boolean

- Raise IllegalState has\_assessment\_section\_begun() is false
   or is\_assessment\_section\_over() is true
- Raise NotFound assessment\_section\_id or item\_id is not found, or item\_id not part of assessment\_section\_id

Raise NullArgument-assessment\_section\_id or item\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.get\_next\_unanswered\_question (assessment\_section\_id, item\_id) Gets the next unanswered question in this assessment section.

#### **Parameters**

- assessment\_section\_id (osid.id.Id) Id of the AssessmentSection
- item\_id (osid.id.Id) Id of the Item

**Returns** the next unanswered question

Return type osid.assessment.Question

Raise IllegalState - has\_next\_unanswered\_question() is false

Raise NotFound - assessment\_section\_id or item\_id is not found, or item\_id not part of assessment\_section\_id

Raise NullArgument-assessment\_section\_id or item\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

*compliance: mandatory – This method must be implemented.* 

Bank .has\_previous\_unanswered\_question (*assessment\_section\_id*, *item\_id*) Tests if there is a previous unanswered question preceeding the given question Id.

#### **Parameters**

- assessment\_section\_id (osid.id.Id) Id of the AssessmentSection
- item\_id (osid.id.Id) Id of the Item

**Returns** true if there is a previous unanswered question, false otherwise

Return type boolean

Raise IllegalState - has\_assessment\_section\_begun() is false
 or is\_assessment\_section\_over() is true

Raise NotFound - assessment\_section\_id or item\_id is not found, or item\_id not part of assessment\_section\_id

Raise NullArgument-assessment\_section\_id or item\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.get\_previous\_unanswered\_question (*assessment\_section\_id*, *item\_id*) Gets the previous unanswered question in this assessment section.

#### **Parameters**

- assessment\_section\_id (osid.id.Id) Id of the AssessmentSection
- item\_id (osid.id.Id) Id of the Item

**Returns** the previous unanswered question

Return type osid.assessment.Question

**Raise** IllegalState - has\_previous\_unanswered\_question() is false

Raise NotFound - assessment\_section\_id or item\_id is not found, or item\_id not part of assessment\_section\_id

Raise NullArgument-assessment\_section\_id or item\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.get\_response(assessment\_section\_id, item\_id)

Gets the submitted response to the associated item.

## Parameters

- assessment\_section\_id (osid.id.Id) Id of the AssessmentSection
- item\_id (osid.id.Id) Id of the Item

Returns the response

Return type osid.assessment.Response

- Raise IllegalState has\_assessment\_section\_begun() is false or is\_assessment\_section\_over() is true
- Raise NotFound assessment\_section\_id or item\_id is not found, or item\_id not part of assessment\_section\_id

Raise NullArgument-assessment\_section\_id or item\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented.* 

Bank .get\_responses (*assessment\_taken\_id*) Gets the submitted responses.

Parameters assessment\_taken\_id (osid.id.Id) - Id of the AssessmentTaken

Returns the submitted answers

Return type osid.assessment.ResponseList

**Raise** NotFound-assessment\_taken\_id is not found

**Raise** NullArgument - assessment\_taken\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Bank.clear\_response(assessment\_section\_id, item\_id)

Clears the response to an item The item appears as unanswered.

If no response exists, the method simply returns.

## Parameters

- assessment\_section\_id (osid.id.Id) Id of the AssessmentSection
- item\_id (osid.id.Id) Id of the Item
- Raise IllegalState has\_assessment\_section\_begun() is false
   or is\_assessment\_section\_over() is true
- Raise NotFound assessment\_section\_id or item\_id is not found, or item\_id not part of assessment\_section\_id

Raise NullArgument-assessment\_section\_id or item\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Bank.finish\_assessment\_section (assessment\_section\_id) Indicates an assessment section is complete.

Finished sections may or may not allow new or updated responses.

Parameters assessment_section_id (osid.id.Id) - Id of the AssessmentSection
<b>Raise</b> IllegalState - has_assessment_section_begun() is false or is_assessment_section_over() is true
<b>Raise</b> NotFound-assessment_section_id is not found
<b>Raise</b> NullArgument - assessment_section_id is null
<b>Raise</b> OperationFailed – unable to complete request
Raise PermissionDenied – authorization failure
compliance: mandatory – This method must be implemented.

```
Bank.is_answer_available (assessment_section_id, item_id)
Tests if an answer is available for the given item.
```

#### **Parameters**

```
• assessment_section_id (osid.id.Id) - Id of the AssessmentSection
```

- item\_id (osid.id.Id) Id of the Item
- **Returns** true if an answer are available, false otherwise

Return type boolean

Raise NotFound - assessment\_section\_id or item\_id is not found, or item\_id not part of assessment\_section\_id

Raise NullArgument-assessment\_section\_id or item\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Bank .get\_answers (*assessment\_section\_id*, *item\_id*) Gets the acceptable answers to the associated item.

#### **Parameters**

- assessment\_section\_id (osid.id.Id) Id of the AssessmentSection
- item\_id (osid.id.Id) Id of the Item

#### Returns the answers

Return type osid.assessment.AnswerList

**Raise** IllegalState - is\_answer\_available() is false

Raise NotFound - assessment\_section\_id or item\_id is not found, or item\_id not part of assessment\_section\_id

Raise NullArgument-assessment\_section\_id or item\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

```
Bank.finish_assessment (assessment_taken_id)
Indicates the entire assessment is complete.
```

Parameters assessment\_taken\_id (osid.id.Id) - Id of the AssessmentTaken Raise IllegalState-has\_begun() is false or is\_over() is true Raise NotFound-assessment\_taken\_id is not found Raise NullArgument-assessment\_taken\_id is null Raise OperationFailed-unable to complete request Raise PermissionDenied-authorization failure

*compliance: mandatory – This method must be implemented.* 

## **Assessment Results Methods**

## Bank.bank\_id

Gets the Bank Id associated with this session.

Returns the Bank Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### Bank.bank

Gets the Bank associated with this session.

Returns the Bank associated with this session

Return type osid.assessment.Bank

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

## Bank.can\_access\_assessment\_results()

Tests if this user can take this assessment.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer assessment operations to unauthorized users.

Returns false if assessment methods are not authorized, true otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

## Bank.get\_items()

Gets all Items.

In plenary mode, the returned list contains all known items or an error results. Otherwise, the returned list may contain only those items that are accessible through this session.

Returns a list of Items

Return type osid.assessment.ItemList

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

#### Bank.get\_responses(assessment\_taken\_id)

Gets the submitted responses.

Parameters assessment\_taken\_id (osid.id.Id) - Id of the AssessmentTaken

**Returns** the submitted answers

Return type osid.assessment.ResponseList

Raise NotFound-assessment\_taken\_id is not found

Raise NullArgument - assessment\_taken\_id is null

**Raise** OperationFailed – unable to complete request

the

the

**Raise** PermissionDenied – authorization failure *compliance: mandatory – This method must be implemented.* Bank.are\_results\_available(assessment\_taken\_id) Tests if the results are available for this assessment. Parameters assessment taken id (osid.id.Id) Id of AssessmentTaken **Returns** true if results are available. false otherwise Return type boolean Raise NotFound-assessment\_taken\_id is not found **Raise** NullArgument - assessment\_taken\_id is null **Raise** OperationFailed – unable to complete request Raise PermissionDenied – authorization failure compliance: mandatory – This method must be implemented. Bank.get\_grade\_entries (assessment\_taken\_id) Gets a list of grade entries for this assessment. Each grade entry may indicate a grade or score input by multiple graders. Parameters assessment taken id (osid.id.Id) Id of \_ AssessmentTaken **Returns** a list of grade entries Return type osid.grading.GradeEntryList **Raise** IllegalState - are\_results\_available() is false Raise NotFound-assessment\_taken\_id is not found Raise NullArgument - assessment\_taken\_id is null **Raise** OperationFailed – unable to complete request **Raise** PermissionDenied – authorization failure compliance: mandatory – This method must be implemented. **Item Lookup Methods** Bank.bank id Gets the Bank Id associated with this session. **Returns** the Bank Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### Bank.bank

Gets the Bank associated with this session.

Returns the Bank associated with this session

Return type osid.assessment.Bank

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

## Bank.can\_lookup\_items()

Tests if this user can perform Item lookups.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations.

Returns false if lookup methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### Bank.use\_comparative\_item\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as assessment, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

## Bank.use\_plenary\_item\_view()

A complete view of the Item returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

#### Bank.use\_federated\_bank\_view()

Federates the view for methods in this session.

A federated view will include assessments taken in banks which are children of this bank in the bank hierarchy.

compliance: mandatory – This method is must be implemented.

#### Bank.use\_isolated\_bank\_view()

Isolates the view for methods in this session.

An isolated view restricts searches to this bank only.

compliance: mandatory – This method is must be implemented.

## Bank.get\_item(item\_id)

Gets the Item specified by its Id.

In plenary mode, the exact Id is found or a NotFound results. Otherwise, the returned Item may have a different Id than requested, such as the case where a duplicate Id was assigned to an Item and retained for compatibility.

Parameters item\_id (osid.id.Id) - the Id of the Item to retrieve

Returns the returned Item

Return type osid.assessment.Item

Raise NotFound - no Item found with the given Id

Raise NullArgument - item\_id is null

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

#### Bank.get\_items\_by\_ids (item\_ids)

Gets an ItemList corresponding to the given IdList.

In plenary mode, the returned list contains all of the items specified in the Id list, in the order of the list, including duplicates, or an error results if an Id in the supplied list is not found or inaccessible. Otherwise, inaccessible Items may be omitted from the list and may present the elements in any order including returning a unique set.

Parameters item\_ids (osid.id.IdList) - the list of Ids to retrieve

Returns the returned Item list

Return type osid.assessment.ItemList

Raise NotFound - an Id was not found

Raise NullArgument - item\_ids is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

#### Bank.get\_items\_by\_genus\_type (item\_genus\_type)

Gets an ItemList corresponding to the given assessment item genus Type which does not include assessment items of genus types derived from the specified Type.

In plenary mode, the returned list contains all known assessment items or an error results. Otherwise, the returned list may contain only those assessment items that are accessible through this session.

Parameters item\_genus\_type (osid.type.Type) - an assessment item genus
type

Returns the returned Item list

Return type osid.assessment.ItemList

**Raise** NullArgument - item\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

#### Bank.get\_items\_by\_parent\_genus\_type(item\_genus\_type)

Gets an ItemList corresponding to the given assessment item genus  $T_{\text{YP}}e$  and include any additional assessment items with genus types derived from the specified  $T_{\text{YP}}e$ .

In plenary mode, the returned list contains all known assessment items or an error results. Otherwise, the returned list may contain only those assessment items that are accessible through this session.

Parameters item\_genus\_type (osid.type.Type) - an assessment item genus
type

Returns the returned Item list

Return type osid.assessment.ItemList

**Raise** NullArgument - item\_genus\_type is null

Raise OperationFailed - unable to complete request

*compliance: mandatory – This method must be implemented.* 

Bank.get\_items\_by\_record\_type (item\_record\_type)

Gets an ItemList containing the given assessment item record Type.

In plenary mode, the returned list contains all known items or an error results. Otherwise, the returned list may contain only those assessment items that are accessible through this session.

**Parameters item\_record\_type** (osid.type.Type) - an item record type

**Returns** the returned Item list

Return type osid.assessment.ItemList

**Raise** NullArgument - item\_record\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

```
Bank.get_items_by_question(question_id)
```

Gets an ItemList containing the given question.

In plenary mode, the returned list contains all known items or an error results. Otherwise, the returned list may contain only those assessment items that are accessible through this session.

Parameters question\_id (osid.id.Id) - a question Id

**Returns** the returned Item list

Return type osid.assessment.ItemList

**Raise** NullArgument - question\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

```
Bank.get_items_by_answer(answer_id)
```

Gets an ItemList containing the given answer.

In plenary mode, the returned list contains all known items or an error results. Otherwise, the returned list may contain only those assessment items that are accessible through this session.

Parameters answer\_id (osid.id.Id) - an answer Id

**Returns** the returned Item list

Return type osid.assessment.ItemList

Raise NullArgument - answer\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

```
Bank.get_items_by_learning_objective (objective_id)
Gets an ItemList containing the given learning objective.
```

In plenary mode, the returned list contains all known items or an error results. Otherwise, the returned list may contain only those assessment items that are accessible through this session.

Parameters objective\_id (osid.id.Id) - a learning objective Id

Returns the returned Item list

Return type osid.assessment.ItemList

Raise NullArgument - objective\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.get\_items\_by\_learning\_objectives (objective\_ids)

Gets an ItemList containing the given learning objectives.

In plenary mode, the returned list contains all known items or an error results. Otherwise, the returned list may contain only those assessment items that are accessible through this session.

Parameters objective\_ids (osid.id.IdList) - a list of learning objective Ids

Returns the returned Item list

Return type osid.assessment.ItemList

**Raise** NullArgument - objective\_ids is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

## Bank.items

Gets all Items.

In plenary mode, the returned list contains all known items or an error results. Otherwise, the returned list may contain only those items that are accessible through this session.

Returns a list of Items

Return type osid.assessment.ItemList

Raise OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

## **Item Query Methods**

Bank.bank\_id

Gets the Bank Id associated with this session.

Returns the Bank Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

## Bank.**bank**

Gets the Bank associated with this session.

Returns the Bank associated with this session

Return type osid.assessment.Bank

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

## Bank.can\_search\_items()

Tests if this user can perform Item searches.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an pplication that may wish not to offer search operations to unauthorized users.

Returns false if search methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### Bank.use\_federated\_bank\_view()

Federates the view for methods in this session.

A federated view will include assessments taken in banks which are children of this bank in the bank hierarchy.

compliance: mandatory – This method is must be implemented.

#### Bank.use\_isolated\_bank\_view()

Isolates the view for methods in this session.

An isolated view restricts searches to this bank only.

compliance: mandatory – This method is must be implemented.

## Bank.item\_query

Gets an assessment item query.

**Returns** the assessment item query

Return type osid.assessment.ItemQuery

compliance: mandatory – This method must be implemented.

## Bank.get\_items\_by\_query(item\_query)

Gets a list of Items matching the given item query.

Parameters item\_query (osid.assessment.ItemQuery) - the item query

Returns the returned ItemList

Return type osid.assessment.ItemList

**Raise** NullArgument - item\_query is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

**Raise** Unsupported – item\_query is not of this service

compliance: mandatory – This method must be implemented.

# **Item Search Methods**

## Bank.item\_search

Gets an assessment item search.

**Returns** the assessment item search

Return type osid.assessment.ItemSearch

compliance: mandatory – This method must be implemented.

## Bank.item\_search\_order

Gets an assessment item search order.

The ItemSearchOrder is supplied to an ItemSearch to specify the ordering of results.

Returns the assessment item search order

Return type osid.assessment.ItemSearchOrder

compliance: mandatory – This method must be implemented.

Bank.get\_items\_by\_search(item\_query, item\_search)

Gets the search results matching the given search query using the given search.

#### **Parameters**

- item\_query (osid.assessment.ItemQuery) the item query
- item\_search (osid.assessment.ItemSearch) the item search

**Returns** the returned search results

Return type osid.assessment.ItemSearchResults

**Raise** NullArgument - item\_query or item\_search is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

Raise Unsupported - item\_search or item\_query is not of this service

compliance: mandatory – This method must be implemented.

## Bank.get\_item\_query\_from\_inspector (*item\_query\_inspector*) Gets an item query from an inspector.

sets an item query from an inspector.

The inspector is available from an ItemSearchResults.

# Parameters item\_query\_inspector ItemQueryInspector) - a query inspector

(osid.assessment.

**Returns** the item query

Return type osid.assessment.ItemQuery

Raise NullArgument - item\_query\_inspector is null

Raise Unsupported - item\_query\_inspector is not of this service

compliance: mandatory – This method must be implemented.

## **Item Admin Methods**

Bank.bank\_id

Gets the Bank Id associated with this session.

Returns the Bank Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### Bank.**bank**

Gets the Bank associated with this session.

Returns the Bank associated with this session

Return type osid.assessment.Bank

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

#### Bank.can\_create\_items()

Tests if this user can create Items.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating an Item will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer create operations to an unauthorized user.

Returns false if Item creation is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Bank.can\_create\_item\_with\_record\_types (item\_record\_types)

Tests if this user can create a single Item using the desired record types.

While AssessmentManager.getItemRecordTypes() can be used to examine which records are supported, this method tests which record(s) are required for creating a specific Item. Providing an empty array tests if an Item can be created with no records.

Parameters item\_record\_types (osid.type.Type[]) - array of item record
 types

**Returns** true if Item creation using the specified record Types is supported, false otherwise

Return type boolean

Raise NullArgument - item\_record\_types is null

compliance: mandatory – This method must be implemented.

#### Bank.get\_item\_form\_for\_create(*item\_record\_types*)

Gets the assessment item form for creating new assessment items.

A new form should be requested for each create transaction.

**Parameters item\_record\_types** (osid.type.Type[]) – array of item record types to be included in the create operation or an empty list if none

**Returns** the assessment item form

Return type osid.assessment.ItemForm

**Raise** NullArgument - item\_record\_types is null

Raise OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

Raise Unsupported – unable to get form for requested record types

compliance: mandatory – This method must be implemented.

#### Bank.create\_item(*item\_form*) Creates a new Item.

Parameters item\_form (osid.assessment.ItemForm) - the form for this Item

Returns the new Item

Return type osid.assessment.Item

**Raise** IllegalState – item\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

Raise NullArgument - item\_form is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

Raise Unsupported - item\_form did not originate from
 get\_item\_form\_for\_create()

compliance: mandatory – This method must be implemented.

#### Bank.can\_update\_items()

Tests if this user can update Items.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating an Item will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer update operations to an unauthorized user.

**Returns** false if assessment item modification is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## Bank.get\_item\_form\_for\_update(item\_id)

Gets the assessment item form for updating an existing item.

A new item form should be requested for each update transaction.

Parameters item\_id (osid.id.Id) - the Id of the Item

Returns the assessment item form

Return type osid.assessment.ItemForm

Raise NotFound - item\_id is not found

**Raise** NullArgument - item\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

## Bank.update\_item(item\_form)

Updates an existing item.

Parameters item\_form (osid.assessment.ItemForm) - the form containing
 the elements to be updated

Raise IllegalState - item\_form already used in an update transaction

Raise InvalidArgument - the form contains an invalid value

**Raise** NullArgument - item\_form is null

Raise PermissionDenied – authorization failure occurred

**Raise** Unsupported – item\_form did not originate from get\_item\_form\_for\_update()

compliance: mandatory – This method must be implemented.

#### Bank.can\_delete\_items()

Tests if this user can delete Items.

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting an Item will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer delete operations to an unauthorized user.

**Returns** false if Item deletion is not authorized, true otherwise

Return type boolean

compliance: mandatory - This method must be implemented.

## Bank.delete\_item(item\_id)

Deletes the Item identified by the given Id.

Parameters item\_id (osid.id.Id) - the Id of the Item to delete

Raise NotFound - an Item was not found identified by the given Id

**Raise** NullArgument - item\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory - This method must be implemented.

## Bank.can\_manage\_item\_aliases()

Tests if this user can manage Id aliases for Items.

A return of true does not guarantee successful authorization. A return of false indicates that it is known changing an alias will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer alias operations to an unauthorized user.

Returns false if Item aliasing is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### Bank.alias\_item(item\_id, alias\_id)

Adds an Id to an Item for the purpose of creating compatibility.

The primary Id of the Item is determined by the provider. The new Id is an alias to the primary Id. If the alias is a pointer to another item, it is reassigned to the given item Id.

## **Parameters**

- item\_id (osid.id.Id) the Id of an Item
- alias\_id (osid.id.Id) the alias Id

Raise AlreadyExists - alias\_id is in use as a primary Id

Raise NotFound - item\_id not found

Raise NullArgument - item\_id or alias\_id is null

Raise PermissionDenied – authorization failure occurred

compliance: mandatory - This method must be implemented.

#### Bank.can\_create\_questions()

Tests if this user can create Questions.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating a Question will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer create operations to an unauthorized user.

Returns false if Question creation is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
Bank.can_create_question_with_record_types (question_record_types)
```

Tests if this user can create a single Question using the desired record types.

While AssessmentManager.getQuestionRecordTypes() can be used to examine which records are supported, this method tests which record(s) are required for creating a specific Question. Providing an empty array tests if a Question can be created with no records.

# Parameters question\_record\_types(osid.type.Type[])-array of question record types

**Returns** true if Question creation using the specified record Types is supported, false otherwise

Return type boolean

Raise NullArgument - question\_record\_types is null

compliance: mandatory – This method must be implemented.

Bank.get\_question\_form\_for\_create(*item\_id*, *question\_record\_types*) Gets the question form for creating new questions.

A new form should be requested for each create transaction.

#### Parameters

- item\_id (osid.id.Id) an assessment item Id
- **question\_record\_types** (osid.type.Type[]) array of question record types to be included in the create operation or an empty list if none

Returns the question form

Return type osid.assessment.QuestionForm

Raise NullArgument - question\_record\_types is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

**Raise** Unsupported – unable to get form for requested record types

compliance: mandatory – This method must be implemented.

Bank.create\_question(question\_form)

Creates a new Question.

Parameters question\_form (osid.assessment.QuestionForm) - the form
 for this Question

 $Returns \ the \ new \ {\tt Question}$ 

Return type osid.assessment.Question

**Raise** AlreadyExists – a question already exists for this item

Raise IllegalState - question\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

Raise NullArgument - question\_form is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

Raise Unsupported - question\_form did not originate from
 get\_question\_form\_for\_create()

compliance: mandatory – This method must be implemented.

#### Bank.can\_update\_questions()

Tests if this user can update Questions.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating a Question will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer update operations to an unauthorized user.

**Returns** false if question modification is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Bank.get\_question\_form\_for\_update (*question\_id*) Gets the question form for updating an existing question.

A new question form should be requested for each update transaction.

Parameters question\_id (osid.id.Id) - the Id of the Question

Returns the question form

Return type osid.assessment.QuestionForm

Raise NotFound - question\_id is not found

Raise NullArgument - question\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

#### Bank.update\_question(question\_form)

Updates an existing question.

Raise IllegalState - question\_form already used in an update transaction

Raise InvalidArgument - the form contains an invalid value

**Raise** NullArgument - question\_form is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

**Raise** Unsupported – question\_form did not originate from get\_question\_form\_for\_update()

compliance: mandatory – This method must be implemented.

#### Bank.can\_delete\_questions()

Tests if this user can delete Questions.

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting a Question will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer delete operations to an unauthorized user.

Returns false if Question deletion is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## Bank.delete\_question(question\_id)

Deletes the Question identified by the given Id.

Parameters question\_id (osid.id.Id) - the Id of the Question to delete

Raise NotFound - a Question was not found identified by the given Id

**Raise** NullArgument - question\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

### Bank.can\_create\_answers()

Tests if this user can create Answers.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating a Answer will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer create operations to an unauthorized user.

Returns false if Answer creation is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Bank.can\_create\_answers\_with\_record\_types (answer\_record\_types) Tests if this user can create a single Answer using the desired record types.

While AssessmentManager.getAnswerRecordTypes() can be used to examine which records are supported, this method tests which record(s) are required for creating a specific Answer. Providing an empty array tests if an Answer can be created with no records.

Parameters answer\_record\_types (osid.type.Type[]) - array of answer record types

**Returns** true if Answer creation using the specified record Types is supported, false otherwise

Return type boolean

**Raise** NullArgument - answern\_record\_types is null

compliance: mandatory – This method must be implemented.

Bank .get\_answer\_form\_for\_create (*item\_id*, *answer\_record\_types*) Gets the answer form for creating new answers.

A new form should be requested for each create transaction.

#### **Parameters**

- item\_id (osid.id.Id) an assessment item Id
- **answer\_record\_types** (osid.type.Type[]) array of answer record types to be included in the create operation or an empty list if none

**Returns** the answer form

Return type osid.assessment.AnswerForm

**Raise** NullArgument - answer\_record\_types is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

Raise Unsupported – unable to get form for requested record types

compliance: mandatory – This method must be implemented.

## Bank.create\_answer(answer\_form)

Creates a new Answer.

**Parameters answer\_form** (osid.assessment.AnswerForm) - the form for this Answer

Returns the new Answer

Return type osid.assessment.Answer

Raise IllegalState - answer\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

Raise NullArgument - answer\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

**Raise** Unsupported – answer\_form did not originate from get\_answer\_form\_for\_create()

compliance: mandatory – This method must be implemented.

#### Bank.can\_update\_answers()

Tests if this user can update Answers.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating an Answer will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer update operations to an unauthorized user.

Returns false if answer modification is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Bank.get\_answer\_form\_for\_update (*answer\_id*) Gets the answer form for updating an existing answer.

A new answer form should be requested for each update transaction.

Parameters answer\_id (osid.id.Id) - the Id of the Answer

**Returns** the answer form

Return type osid.assessment.AnswerForm

Raise NotFound - answer\_id is not found

Raise NullArgument - answer\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

### Bank.update\_answer(answer\_form)

Updates an existing answer.

**Parameters answer\_form** (osid.assessment.AnswerForm) – the form containing the elements to be updated

Raise IllegalState - answer\_form already used in an update transaction

Raise InvalidArgument - the form contains an invalid value

**Raise** NullArgument - answer\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

**Raise** Unsupported – answer\_form did not originate from get\_answer\_form\_for\_update()

*compliance: mandatory – This method must be implemented.* 

# Bank.can\_delete\_answers()

Tests if this user can delete Answers.

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting an Answer will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer delete operations to an unauthorized user.

Returns false if Answer deletion is not authorized, true otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

Bank.delete\_answer(answer\_id)

Deletes the Answer identified by the given Id.

Parameters answer\_id (osid.id.Id) - the Id of the Answer to delete

Raise NotFound - an Answer was not found identified by the given Id

**Raise** NullArgument - answer\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

## **Item Notification Methods**

## Bank.bank\_id

Gets the Bank Id associated with this session.

Returns the Bank Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### Bank.bank

Gets the Bank associated with this session.

Returns the Bank associated with this session

Return type osid.assessment.Bank

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

### Bank.can\_register\_for\_item\_notifications()

Tests if this user can register for Item notifications.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer notification operations.

Returns false if notification methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# Bank.use\_federated\_bank\_view()

Federates the view for methods in this session.

A federated view will include assessments taken in banks which are children of this bank in the bank hierarchy.

compliance: mandatory – This method is must be implemented.

### Bank.use\_isolated\_bank\_view()

Isolates the view for methods in this session.

An isolated view restricts searches to this bank only.

compliance: mandatory - This method is must be implemented.

Bank.reliable\_item\_notifications()

Reliable notifications are desired.

In reliable mode, notifications are to be acknowledged using acknowledge item notification().

compliance: mandatory – This method is must be implemented.

# Bank.unreliable\_item\_notifications()

Unreliable notifications are desired.

In unreliable mode, notifications do not need to be acknowledged.

compliance: mandatory – This method is must be implemented.

### Bank.acknowledge\_item\_notification (*notification\_id*) Acknowledge an item notification.

Parameters notification\_id (osid.id.Id) - the Id of the notification

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## Bank.register\_for\_new\_items()

Register for notifications of new assessment items.

ItemReceiver.newItems() is invoked when a new Item is created.

Raise OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

### Bank.register\_for\_changed\_items()

Registers for notification of updated assessment items.

ItemReceiver.changedItems() is invoked when an assessment item is changed.

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

*compliance: mandatory – This method must be implemented.* 

### Bank.register\_for\_changed\_item(item\_id)

Registers for notification of an updated assessment item.

ItemReceiver.changedItems () is invoked when the specified assessment item is changed.

Parameters item\_id (osid.id.Id) - the Id of the Assessment to monitor

 $Raise \; {\tt NotFound-an \; item \; was \; not \; found \; identified \; by \; the \; given \; {\tt Id}}$ 

Raise NullArgument-item\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

### Bank.register\_for\_deleted\_items()

Registers for notification of deleted assessment items.

ItemReceiver.deletedItems() is invoked when an assessment item is removed from the assessment bank.

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

### Bank.register\_for\_deleted\_item(item\_id)

Registers for notification of a deleted assessment item.

ItemReceiver.deletedItems() is invoked when the specified assessment item is removed from the assessment bank.

**Parameters item\_id** (osid.id.Id) - the Id of the Item to monitor

Raise NotFound - an Item was not found identified by the given Id

Raise NullArgument - item\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

## **Item Bank Methods**

### Bank.can\_lookup\_item\_bank\_mappings()

Tests if this user can perform lookups of item/bank mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known lookup methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

**Returns** false if looking up mappings is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### Bank.use\_comparative\_bank\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as assessment, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

## Bank.use\_plenary\_bank\_view()

A complete view of the AssessmentTaken and Bank returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

### Bank.get\_item\_ids\_by\_bank(bank\_id)

Gets the list of Item Ids associated with a Bank.

Parameters bank\_id (osid.id.Id) - Id of the Bank

Returns list of related item Ids

Return type osid.id.IdList

Raise NotFound - bank\_id is not found

Raise NullArgument - bank\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

#### Bank.get\_items\_by\_bank(bank\_id)

Gets the list of Items associated with a Bank.

Parameters bank\_id (osid.id.Id) - Id of the Bank

Returns list of related items

Return type osid.assessment.ItemList

**Raise** NotFound – bank\_id is not found

**Raise** NullArgument - bank\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

### Bank.get\_item\_ids\_by\_banks(bank\_ids)

Gets the list of Item Ids corresponding to a list of Banks.

Parameters bank\_ids (osid.id.IdList) - list of bank Ids

Returns list of bank Ids

Return type osid.id.IdList

**Raise** NullArgument - bank\_ids is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – assessment failure

compliance: mandatory – This method must be implemented.

# Bank.get\_items\_by\_banks(bank\_ids)

Gets the list of Items corresponding to a list of Banks.

Parameters bank\_ids (osid.id.IdList) - list of bank Ids

Returns list of items

Return type osid.assessment.ItemList

**Raise** NullArgument - bank\_ids is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - assessment failure

compliance: mandatory – This method must be implemented.

Bank.get\_bank\_ids\_by\_item(*item\_id*)

Gets the list of Bank Ids mapped to an Item.

Parameters item\_id (osid.id.Id) - Id of an Item

Returns list of bank Ids

Return type osid.id.IdList

**Raise** NotFound – item\_id is not found

Raise NullArgument - item\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – assessment failure

compliance: mandatory – This method must be implemented.

# Bank.get\_banks\_by\_item(item\_id)

Gets the list of Banks mapped to an Item.

Parameters item\_id (osid.id.Id) - Id of an Item

Returns list of banks Return type osid.assessment.BankList Raise NotFound - item\_id is not found Raise NullArgument - item\_id is null Raise OperationFailed - unable to complete request Raise PermissionDenied - assessment failure compliance: mandatory - This method must be implemented.

### Item Bank Assignment Methods

#### Bank.can\_assign\_items()

Tests if this user can alter item/bank mappings.

A return of true does not guarantee successful assessment. A return of false indicates that it is known mapping methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer assignment operations to unauthorized users.

Returns false if mapping is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
Bank.can_assign_items_to_bank(bank_id)
```

Tests if this user can alter item/bank mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known mapping methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

Parameters bank\_id (osid.id.Id) - the Id of the Bank

**Returns** false if mapping is not authorized, true otherwise

Return type boolean

Raise NullArgument - bank\_id is null

compliance: mandatory – This method must be implemented.

#### Bank.get\_assignable\_bank\_ids(bank\_id)

Gets a list of banks including and under the given banks node in which any assessment taken can be assigned.

Parameters bank\_id (osid.id.Id) - the Id of the Bank

**Returns** list of assignable bank Ids

Return type osid.id.IdList

Raise NullArgument - bank\_id is null

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

Bank.get\_assignable\_bank\_ids\_for\_item(bank\_id, item\_id)

Gets a list of banks including and under the given bank node in which a specific item can be assigned.

Parameters

- **bank\_id** (osid.id.Id) the Id of the Bank
- item\_id (osid.id.Id) the Id of the Item

Returns list of assignable bank Ids

Return type osid.id.IdList

Raise NullArgument - bank\_id or item\_id is null

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

### Bank.assign\_item\_to\_bank(item\_id, bank\_id)

Adds an existing Item to a Bank.

### **Parameters**

- item\_id (osid.id.Id) the Id of the Item
- **bank\_id** (osid.id.Id) the Id of the Bank

Raise AlreadyExists - item\_id is already assigned to bank\_id

**Raise** NotFound – item\_id or bank\_id not found

Raise NullArgument - item\_id or bank\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

## Bank.unassign\_item\_from\_bank(item\_id, bank\_id)

Removes an Item from a Bank.

## Parameters

- item\_id (osid.id.Id) the Id of the Item
- **bank\_id** (osid.id.Id) the Id of the Bank
- **Raise** NotFound item\_id or bank\_id not found or item\_id not assigned to bank\_id

**Raise** NullArgument - item\_id or bank\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

### Bank.**reassign\_item\_to\_billing** (*item\_id*, *from\_bank\_id*, *to\_bank\_id*) Moves an Item from one Bank to another.

vioves an ittem nom one bank to another

Mappings to other Banks are unaffected.

# Parameters

- item\_id (osid.id.Id) the Id of the Item
- from\_bank\_id (osid.id.Id) the Id of the current Bank
- to\_bank\_id (osid.id.Id) the Id of the destination Bank

Raise NotFound - item\_id, from\_bank\_id, or to\_bank\_id not found or item\_id not mapped to from\_bank\_id Raise NullArgument-item\_id, from\_bank\_id, orto\_bank\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## **Assessment Lookup Methods**

#### Bank.bank\_id

Gets the Bank Id associated with this session.

Returns the Bank Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

### Bank.bank

Gets the Bank associated with this session.

Returns the Bank associated with this session

Return type osid.assessment.Bank

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

#### Bank.can\_lookup\_assessments()

Tests if this user can perform Assessment lookups.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

**Returns** false if lookup methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# Bank.use\_comparative\_assessment\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as assessment, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

#### Bank.use\_plenary\_assessment\_view()

A complete view of the Assessment returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory - This method is must be implemented.

### Bank.use\_federated\_bank\_view()

Federates the view for methods in this session.

A federated view will include assessments taken in banks which are children of this bank in the bank hierarchy.

compliance: mandatory – This method is must be implemented.

#### Bank.use\_isolated\_bank\_view()

Isolates the view for methods in this session.

An isolated view restricts searches to this bank only.

compliance: mandatory – This method is must be implemented.

#### Bank.get\_assessment(assessment\_id)

Gets the Assessment specified by its Id.

In plenary mode, the exact Id is found or a NotFound results. Otherwise, the returned Assessment may have a different Id than requested, such as the case where a duplicate Id was assigned to a Assessment and retained for compatibility.

Parameters assessment\_id (osid.id.Id) - Id of the Assessment

Returns the assessment

Return type osid.assessment.Assessment

**Raise** NotFound - assessment\_id not found

**Raise** NullArgument - assessment\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

*compliance: mandatory – This method is must be implemented.* 

## Bank.get\_assessments\_by\_ids(assessment\_ids)

Gets an AssessmentList corresponding to the given IdList.

In plenary mode, the returned list contains all of the assessments specified in the Id list, in the order of the list, including duplicates, or an error results if an Id in the supplied list is not found or inaccessible. Otherwise, inaccessible Assessments may be omitted from the list and may present the elements in any order including returning a unique set.

Parameters assessment\_ids (osid.id.IdList) - the list of Ids to retrieve

Returns the returned Assessment list

Return type osid.assessment.AssessmentList

Raise NotFound - an Id was not found

Raise NullArgument - assessment\_ids is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – assessment failure

compliance: mandatory – This method must be implemented.

### Bank.get\_assessments\_by\_genus\_type (assessment\_genus\_type)

Gets an AssessmentList corresponding to the given assessment genus Type which does not include assessments of types derived from the specified Type.

In plenary mode, the returned list contains all known assessments or an error results. Otherwise, the returned list may contain only those assessments that are accessible through this session.

Parameters assessment\_genus\_type (osid.type.Type) - an assessment
genus type

Returns the returned Assessment list

Return type osid.assessment.AssessmentList

**Raise** NullArgument - assessment\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.get\_assessments\_by\_parent\_genus\_type (assessment\_genus\_type)

Gets an AssessmentList corresponding to the given assessment genus Type and include any additional assessments with genus types derived from the specified Type.

In plenary mode, the returned list contains all known assessments or an error results. Otherwise, the returned list may contain only those assessments that are accessible through this session.

Parameters assessment\_genus\_type (osid.type.Type) - an assessment
genus type

Returns the returned Assessment list

Return type osid.assessment.AssessmentList

**Raise** NullArgument - assessment\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.get\_assessments\_by\_record\_type (assessment\_record\_type)

Gets an AssessmentList corresponding to the given assessment record Type.

The set of assessments implementing the given record type is returned. In plenary mode, the returned list contains all known assessments or an error results. Otherwise, the returned list may contain only those assessments that are accessible through this session.

Parameters assessment\_record\_type (osid.type.Type) - an assessment record type

Returns the returned Assessment list

Return type osid.assessment.AssessmentList

**Raise** NullArgument - assessment\_record\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

### Bank.assessments

Gets all Assessments.

In plenary mode, the returned list contains all known assessments or an error results. Otherwise, the returned list may contain only those assessments that are accessible through this session.

**Returns** a list of Assessments

Return type osid.assessment.AssessmentList

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

# **Assessment Query Methods**

### Bank.bank\_id

Gets the Bank Id associated with this session.

Returns the Bank Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### Bank.bank

Gets the Bank associated with this session.

Returns the Bank associated with this session

Return type osid.assessment.Bank

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

#### Bank.can\_search\_assessments()

Tests if this user can perform Assessment searches.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an pplication that may wish not to offer search operations to unauthorized users.

Returns false if search methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### Bank.use\_federated\_bank\_view()

Federates the view for methods in this session.

A federated view will include assessments taken in banks which are children of this bank in the bank hierarchy.

compliance: mandatory – This method is must be implemented.

### Bank.use\_isolated\_bank\_view()

Isolates the view for methods in this session.

An isolated view restricts searches to this bank only.

compliance: mandatory – This method is must be implemented.

## Bank.assessment\_query

Gets an assessment query.

Returns the assessment query

Return type osid.assessment.AssessmentQuery

compliance: mandatory – This method must be implemented.

# Bank.get\_assessments\_by\_query(assessment\_query)

Gets a list of Assessments matching the given assessment query.

Parameters assessment\_query (osid.assessment.AssessmentQuery) the assessment query

Returns the returned AssessmentList

Return type osid.assessment.AssessmentList

**Raise** NullArgument - assessment\_query is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

Raise Unsupported - assessment\_query is not of this service

compliance: mandatory – This method must be implemented.

# **Assessment Admin Methods**

### Bank.bank\_id

Gets the Bank Id associated with this session.

Returns the Bank Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

### Bank.bank

Gets the Bank associated with this session.

Returns the Bank associated with this session

Return type osid.assessment.Bank

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

### Bank.can\_create\_assessments()

Tests if this user can create Assessments.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating an Assessment will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer create operations to an unauthorized user.

Returns false if Assessment creation is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# Bank.can\_create\_assessment\_with\_record\_types (assessment\_record\_types)

Tests if this user can create a single Assessment using the desired record interface types.

While AssessmentManager.getAssessmentRecordTypes() can be used to examine which record interfaces are supported, this method tests which record(s) are required for creating a specific Assessment. Providing an empty array tests if an Assessment can be created with no records.

Parameters assessment\_record\_types (osid.type.Type[]) - array of assessment record types **Returns** true if Assessment creation using the specified record Types is supported, false otherwise

Return type boolean

**Raise** NullArgument - assessment\_record\_types is null

compliance: mandatory – This method must be implemented.

Bank.get\_assessment\_form\_for\_create (assessment\_record\_types) Gets the assessment form for creating new assessments.

A new form should be requested for each create transaction.

**Parameters assessment\_record\_types** (osid.type.Type[]) – array of assessment record types to be included in the create operation or an empty list if none

Returns the assessment form

Return type osid.assessment.AssessmentForm

**Raise** NullArgument - assessment\_record\_types is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

Raise Unsupported – unable to get form for requested record types

compliance: mandatory – This method must be implemented.

#### Bank.create\_assessment (assessment\_form)

Creates a new Assessment.

Parameters assessment\_form (osid.assessment.AssessmentForm) - the form for this Assessment

Returns the new Assessment

Return type osid.assessment.Assessment

Raise IllegalState - assessment\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

**Raise** NullArgument - assessment\_form is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

Raise Unsupported - assessment\_form did not originate from
 get\_assessment\_form\_for\_create()

compliance: mandatory – This method must be implemented.

### Bank.can\_update\_assessments()

Tests if this user can update Assessments.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating an Assessment will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer update operations to an unauthorized user.

Returns false if Assessment modification is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Bank .get\_assessment\_form\_for\_update (*assessment\_id*) Gets the assessment form for updating an existing assessment.

A new assessment form should be requested for each update transaction.

Parameters assessment\_id (osid.id.Id) - the Id of the Assessment

**Returns** the assessment form

Return type osid.assessment.AssessmentForm

**Raise** NotFound - assessment\_id is not found

Raise NullArgument - assessment\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory - This method must be implemented.

#### Bank.update\_assessment (assessment\_form)

Updates an existing assessment.

**Parameters assessment\_form** (osid.assessment.AssessmentForm) - the form containing the elements to be updated

Raise IllegalState - assessment\_form already used in an update transaction

**Raise** InvalidArgument – the form contains an invalid value

**Raise** NullArgument - assessment\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

Raise Unsupported - assessment\_form did not originate from
 get\_assessment\_form\_for\_update()

compliance: mandatory – This method must be implemented.

### Bank.can\_delete\_assessments()

Tests if this user can delete Assessments.

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting an Assessment will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer delete operations to an unauthorized user.

Returns false if Assessment deletion is not authorized, true otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

Bank.delete\_assessment (assessment\_id)

Deletes an Assessment.

Parameters assessment\_id (osid.id.Id) - the Id of the Assessment to remove

**Raise** NotFound-assessment\_id not found

**Raise** NullArgument - assessment\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

#### Bank.can\_manage\_assessment\_aliases()

Tests if this user can manage Id aliases for Assessments.

A return of true does not guarantee successful authorization. A return of false indicates that it is known changing an alias will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer alias operations to an unauthorized user.

**Returns** false if Assessment aliasing is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### Bank.alias\_assessment(assessment\_id, alias\_id)

Adds an Id to an Assessment for the purpose of creating compatibility.

The primary Id of the Assessment is determined by the provider. The new Id is an alias to the primary Id. If the alias is a pointer to another assessment, it is reassigned to the given assessment Id.

### **Parameters**

- assessment\_id (osid.id.Id) the Id of an Assessment
- alias\_id (osid.id.Id) the alias Id

Raise AlreadyExists - alias\_id is in use as a primary Id

**Raise** NotFound-assessment\_id not found

Raise NullArgument - assessment\_id or alias\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

# **Assessment Bank Methods**

#### Bank.can\_lookup\_assessment\_bank\_mappings()

Tests if this user can perform lookups of assessment/bank mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known lookup methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

**Returns** false if looking up mappings is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### Bank.use\_comparative\_bank\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as assessment, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

#### Bank.use\_plenary\_bank\_view()

A complete view of the AssessmentTaken and Bank returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

```
Bank.get_assessment_ids_by_bank (bank_id)
Gets the list of Assessment Ids associated with a Bank.
```

**Parameters bank\_id** (osid.id.Id) - Id of the Bank

**Returns** list of related assessment Ids

Return type osid.id.IdList

Raise NotFound - bank\_id is not found

Raise NullArgument - bank\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

# Bank.get\_assessments\_by\_bank(bank\_id)

Gets the list of Assessments associated with a Bank.

Parameters bank\_id (osid.id.Id) - Id of the Bank

Returns list of related assessments

Return type osid.assessment.AssessmentList

Raise NotFound - bank\_id is not found

**Raise** NullArgument - bank\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

#### Bank.get\_assessment\_ids\_by\_banks(bank\_ids)

Gets the list of Assessment Ids corresponding to a list of Banks.

Parameters bank\_ids (osid.id.IdList) - list of bank Ids

Returns list of bank Ids

Return type osid.id.IdList

**Raise** NullArgument - bank\_ids is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

*compliance: mandatory – This method must be implemented.* 

### Bank.get\_assessments\_by\_banks(bank\_ids)

Gets the list of Assessments corresponding to a list of Banks.

Parameters bank\_ids (osid.id.IdList) - list of bank Ids

Returns list of assessments

Return type osid.assessment.AssessmentList

**Raise** NullArgument - bank\_ids is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

```
Bank.get_bank_ids_by_assessment (assessment_id)
```

Gets the list of Bank Ids mapped to an Assessment.

Parameters assessment\_id (osid.id.Id) - Id of an Assessment

Returns list of bank Ids

Return type osid.id.IdList

Raise NotFound-assessment\_id is not found

**Raise** NullArgument - assessment\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

# Bank.get\_banks\_by\_assessment (assessment\_id)

Gets the list of Banks mapped to an Assessment.

Parameters assessment\_id (osid.id.Id) - Id of an Assessment

Returns list of banks

Return type osid.assessment.BankList

**Raise** NotFound - assessment\_id is not found

Raise NullArgument - assessment\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

### **Assessment Bank Assignment Methods**

#### Bank.can\_assign\_assessments()

Tests if this user can alter assessment/bank mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known mapping methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

Returns false if mapping is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
Bank.can_assign_assessments_to_bank (bank_id)
Tests if this user can alter assessment/bank mappings.
```

A return of true does not guarantee successful authorization. A return of false indicates that it is known mapping methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

Parameters bank\_id (osid.id.Id) - the Id of the Bank

**Returns** false if mapping is not authorized, true otherwise

Return type boolean

Raise NullArgument - bank\_id is null

compliance: mandatory – This method must be implemented.

### Bank.get\_assignable\_bank\_ids(bank\_id)

Gets a list of banks including and under the given banks node in which any assessment taken can be assigned.

Parameters bank\_id (osid.id.Id) - the Id of the Bank

Returns list of assignable bank Ids

Return type osid.id.IdList

**Raise** NullArgument - bank\_id is null

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

## Bank.get\_assignable\_bank\_ids\_for\_assessment(bank\_id, assessment\_id)

Gets a list of bank including and under the given bank node in which a specific assessment can be assigned.

### **Parameters**

- **bank\_id** (osid.id.Id) the Id of the Bank
- assessment\_id (osid.id.Id) the Id of the Assessment

Returns list of assignable bank Ids

Return type osid.id.IdList

Raise NullArgument - bank\_id or assessment\_id is null

Raise OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

Bank.assign\_assessment\_to\_bank(assessment\_id, bank\_id)

Adds an existing Assessment to a Bank.

#### Parameters

- assessment\_id (osid.id.Id) the Id of the Assessment
- **bank\_id** (osid.id.Id) the Id of the Bank

Raise AlreadyExists - assessment\_id is already assigned to bank\_id

Raise NotFound-assessment\_id or bank\_id not found

Raise NullArgument - assessment\_id or bank\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.unassign\_assessment\_from\_bank (assessment\_id, bank\_id)

Removes an Assessment from a Bank.

### **Parameters**

- assessment\_id (osid.id.Id) the Id of the Assessment
- **bank\_id** (osid.id.Id) the Id of the Bank
- Raise NotFound assessment\_id or bank\_id not found or assessment\_id
   not assigned to bank\_id
- **Raise** NullArgument assessment\_id or bank\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.reassign\_assessment\_to\_billing (assessment\_id, from\_bank\_id, to\_bank\_id) Moves an Assessment from one Bank to another.

Mappings to other Banks are unaffected.

### Parameters

- assessment\_id (osid.id.Id) the Id of the Assessment
- from\_bank\_id (osid.id.Id) the Id of the current Bank
- to\_bank\_id (osid.id.Id) the Id of the destination Bank
- Raise NotFound assessment\_id, from\_bank\_id, or to\_bank\_id not found or assessment\_id not mapped to from\_bank\_id
- Raise NullArgument assessment\_id, from\_bank\_id, or to\_bank\_id is
   null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

### **Assessment Basic Authoring Methods**

#### Bank.bank\_id

Gets the Bank Id associated with this session.

Returns the Bank Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

## Bank.bank

Gets the Bank associated with this session.

Returns the Bank associated with this session

Return type osid.assessment.Bank

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

### Bank.can\_author\_assessments()

Tests if this user can author assessments.

A return of true does not guarantee successful authorization. A return of false indicates that it is known mapping methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer authoring operations to unauthorized users.

**Returns** false if mapping is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
Bank.get_items()
```

Gets all Items.

In plenary mode, the returned list contains all known items or an error results. Otherwise, the returned list may contain only those items that are accessible through this session.

**Returns** a list of Items

Return type osid.assessment.ItemList

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

### Bank.add\_item(assessment\_id, item\_id)

Adds an existing Item to an assessment.

#### **Parameters**

- assessment\_id (osid.id.Id) the Id of the Assessment
- item\_id (osid.id.Id) the Id of the Item

Raise NotFound-assessment\_id or item\_id not found

Raise NullArgument - assessment\_id or item\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.remove\_item(assessment\_id, item\_id)

Removes an Item from this assessment.

# Parameters

- assessment\_id (osid.id.Id) the Id of the Assessment
- item\_id (osid.id.Id) the Id of the Item

**Raise** NotFound - assessment\_id or item\_id not found or item\_id not on assessmentid

Raise NullArgument - assessment\_id or item\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank .move\_item (*assessment\_id*, *item\_id*, *preceeding\_item\_id*) Moves an existing item to follow another item in an assessment.

#### **Parameters**

- assessment\_id (osid.id.Id) the Id of the Assessment
- item\_id (osid.id.Id) the Id of an Item
- preceeding\_item\_id (osid.id.Id) the Id of a preceeding Item in the sequence
- Raise NotFound assessment\_id is not found, or item\_id or
  preceeding\_item\_id not on assessment\_id
- Raise NullArgument assessment\_id, item\_id or preceeding\_item\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

# Bank.order\_items (item\_ids, assessment\_id)

Sequences existing items in an assessment.

#### **Parameters**

- item\_ids (osid.id.Id[]) the Id of the Items
- assessment\_id (osid.id.Id) the Id of the Assessment
- **Raise** NotFound assessment\_id is not found or an item\_id is not on assessment\_id
- **Raise** NullArgument assessment\_id or item\_ids is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

### Assessment Offered Lookup Methods

Bank.bank\_id

Gets the Bank Id associated with this session.

Returns the Bank Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### Bank.bank

Gets the Bank associated with this session.

Returns the Bank associated with this session

Return type osid.assessment.Bank

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

#### Bank.can\_lookup\_assessments\_offered()

Tests if this user can perform AssessmentOffered lookups.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

**Returns** false if lookup methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### Bank.use\_comparative\_assessment\_offered\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as assessment, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

### Bank.use\_plenary\_assessment\_offered\_view()

A complete view of the AssessmentOffered returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory - This method is must be implemented.

#### Bank.use\_federated\_bank\_view()

Federates the view for methods in this session.

A federated view will include assessments taken in banks which are children of this bank in the bank hierarchy.

compliance: mandatory – This method is must be implemented.

### Bank.use\_isolated\_bank\_view()

Isolates the view for methods in this session.

An isolated view restricts searches to this bank only.

compliance: mandatory – This method is must be implemented.

```
Bank.get_assessment_offered(assessment_offered_id)
```

Gets the AssessmentOffered specified by its Id.

In plenary mode, the exact Id is found or a NotFound results. Otherwise, the returned AssessmentOffered may have a different Id than requested, such as the case where a duplicate Id was assigned to an AssessmentOffered and retained for compatibility.

```
Parameters assessment_offered_id (osid.id.Id) - Id of the AssessmentOffered
```

Returns the assessment offered

Return type osid.assessment.AssessmentOffered

Raise NotFound-assessment\_offered\_id not found

Raise NullArgument - assessment\_offered\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory - This method is must be implemented.

Bank.get\_assessments\_offered\_by\_ids (assessment\_offered\_ids)

Gets an AssessmentOfferedList corresponding to the given IdList.

In plenary mode, the returned list contains all of the assessments specified in the Id list, in the order of the list, including duplicates, or an error results if an Id in the supplied list is not found or inaccessible. Otherwise, inaccessible AssessmentOffered objects may be omitted from the list and may present the elements in any order including returning a unique set.

**Parameters** assessment\_offered\_ids (osid.id.IdList) - the list of Ids to retrieve

Returns the returned AssessmentOffered list

Return type osid.assessment.AssessmentOfferedList

Raise NotFound - an Id was not found

Raise NullArgument - assessment\_offered\_ids is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - assessment failure

compliance: mandatory – This method must be implemented.

## Bank.get\_assessments\_offered\_by\_genus\_type (assessment\_offered\_genus\_type)

Gets an AssessmentOfferedList corresponding to the given assessment offered genus Type which does not include assessments of types derived from the specified Type.

In plenary mode, the returned list contains all known assessments offered or an error results. Otherwise, the returned list may contain only those assessments offered that are accessible through this session.

```
Parameters assessment_offered_genus_type (osid.type.Type) - an assessment offered genus type
```

Returns the returned AssessmentOffered list

Return type osid.assessment.AssessmentOfferedList

**Raise** NullArgument - assessment\_offered\_genus\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.get\_assessments\_offered\_by\_parent\_genus\_type (assessment\_offered\_genus\_type) Gets an AssessmentOfferedList corresponding to the given assessment offered genus Type and include any additional assessments with genus types derived from the specified Type.

In plenary mode, the returned list contains all known assessments or an error results. Otherwise, the returned list may contain only those assessments offered that are accessible through this session.

**Parameters assessment\_offered\_genus\_type** (osid.type.Type) - an assessment offered genus type

Returns the returned AssessmentOffered list

Return type osid.assessment.AssessmentOfferedList

**Raise** NullArgument - assessment\_offered\_genus\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

*compliance: mandatory – This method must be implemented.* 

### Bank.get\_assessments\_offered\_by\_record\_type (assessment\_record\_type)

Gets an AssessmentOfferedList corresponding to the given assessment offered record Type.

The set of assessments implementing the given record type is returned. In plenary mode, the returned list contains all known assessments offered or an error results. Otherwise, the returned list may contain only those assessments offered that are accessible through this session.

**Parameters assessment\_record\_type** (osid.type.Type) - an assessment offered record type

Returns the returned AssessmentOffered list

**Return type** osid.assessment.AssessmentOfferedList

**Raise** NullArgument - assessment\_offered\_record\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

#### Bank.get\_assessments\_offered\_by\_date(start, end)

Gets an AssessmentOfferedList that have designated start times where the start times fall in the given range inclusive.

In plenary mode, the returned list contains all known assessments offered or an error results. Otherwise, the returned list may contain only those assessments offered that are accessible through this session.

## **Parameters**

- **start** (osid.calendaring.DateTime) start of time range
- end (osid.calendaring.DateTime) end of time range

Returns the returned AssessmentOffered list

Return type osid.assessment.AssessmentOfferedList

Raise InvalidArgument - end is less than start

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

```
Bank.get_assessments_offered_for_assessment (assessment_id)
```

Gets an AssessmentOfferedList by the given assessment.

In plenary mode, the returned list contains all known assessments offered or an error results. Otherwise, the returned list may contain only those assessments offered that are accessible through this session.

Parameters assessment\_id (osid.id.Id) - Id of an Assessment

Returns the returned AssessmentOffered list

Return type osid.assessment.AssessmentOfferedList

Raise NullArgument - assessment\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

#### Bank.assessments\_offered

Gets all AssessmentOffered elements.

In plenary mode, the returned list contains all known assessments offered or an error results. Otherwise, the returned list may contain only those assessments offered that are accessible through this session.

Returns a list of AssessmentOffered elements

Return type osid.assessment.AssessmentOfferedList

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

#### Assessment Offered Query Methods

### Bank.bank\_id

Gets the Bank Id associated with this session.

Returns the Bank Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

## Bank.bank

Gets the Bank associated with this session.

Returns the Bank associated with this session

Return type osid.assessment.Bank

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

#### Bank.can\_search\_assessments\_offered()

Tests if this user can perform AssessmentOffered searches.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may wish not to offer search operations to unauthorized users.

Returns false if search methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### Bank.use\_federated\_bank\_view()

Federates the view for methods in this session.

A federated view will include assessments taken in banks which are children of this bank in the bank hierarchy.

compliance: mandatory - This method is must be implemented.

#### Bank.use\_isolated\_bank\_view() Isolates the view for methods in this session.

An isolated view restricts searches to this bank only.

compliance: mandatory – This method is must be implemented.

### Bank.assessment\_offered\_query Gets an assessment offered query.

**Returns** the assessment offered query

Return type osid.assessment.AssessmentOfferedQuery

compliance: mandatory – This method must be implemented.

Bank.get\_assessments\_offered\_by\_query(assessment\_offered\_query)

Gets a list of AssessmentOffered elements matching the given assessment offered query.

Parameters assessment\_offered\_query (osid.assessment. AssessmentOfferedQuery) - the assessment offered query

**Returns** the returned AssessmentOfferedList

Return type osid.assessment.AssessmentOfferedList

**Raise** NullArgument - assessment\_offered\_query is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

Raise Unsupported - assessment\_offered\_query is not of this service

compliance: mandatory – This method must be implemented.

# **Assessment Offered Admin Methods**

### Bank.bank\_id

Gets the Bank Id associated with this session.

Returns the Bank Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

### Bank.bank

Gets the Bank associated with this session.

Returns the Bank associated with this session

Return type osid.assessment.Bank

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

## Bank.can\_create\_assessments\_offered()

Tests if this user can create AssessmentOffered objects.

A return of true does not guarantee successful authoriization. A return of false indicates that it is known creating an AssessmentOffered will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer create operations to an unauthorized user.

Returns false if AssessmentOffered creation is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Bank.can\_create\_assessment\_offered\_with\_record\_types (assessment\_offered\_record\_types) Tests if this user can create a single AssessmentOffered using the desired record types.

While AssessmentManager.getAssessmentOfferedRecordTypes() can be used to examine which records are supported, this method tests which record(s) are required for creating a specific AssessmentOffered. Providing an empty array tests if an AssessmentOffered can be created with no records.

- **Parameters assessment\_offered\_record\_types** (osid.type.Type[]) array of assessment offered record types
- **Returns** true if AssessmentOffered creation using the specified record Types is supported, false otherwise

Return type boolean

**Raise** NullArgument - assessment\_offered\_record\_types is null

compliance: mandatory – This method must be implemented.

```
Bank.get_assessment_offered_form_for_create(assessment_id, assess-
ment_offered_record_types)
```

Gets the assessment offered form for creating new assessments offered.

A new form should be requested for each create transaction.

### Parameters

- assessment\_id (osid.id.Id) the Id of the related Assessment
- **assessment\_offered\_record\_types** (osid.type.Type[]) array of assessment offered record types to be included in the create operation or an empty list if none

Returns the assessment offered form

Return type osid.assessment.AssessmentOfferedForm

**Raise** NotFound - assessment\_id is not found

Raise NullArgument - assessment\_id or assessment\_offered\_record\_types
 is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

Raise Unsupported – unable to get form for requested record types

compliance: mandatory – This method must be implemented.

```
Bank.create_assessment_offered(assessment_offered_form)
```

```
Creates a new AssessmentOffered.
```

Parameters assessment\_offered\_form(osid.assessment.AssessmentOfferedForm) - the form for this AssessmentOffered

Returns the new AssessmentOffered

Return type osid.assessment.AssessmentOffered

**Raise** IllegalState - assessment\_offrered\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

**Raise** NullArgument - assessment\_form is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

```
Raise Unsupported - assessment_form did not originate from
  get_assessment_form_for_create()
```

compliance: mandatory – This method must be implemented.

### Bank.can\_update\_assessments\_offered()

Tests if this user can update AssessmentOffered objects.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating an AssessmentOffered will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer update operations to an unauthorized user.

Returns false if Assessment modification is not authorized, true otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

```
Bank .get_assessment_offered_form_for_update (assessment_offered_id)
Gets the assessment offered form for updating an existing assessment offered.
```

A new assessment offered form should be requested for each update transaction.

```
Parameters assessment_offered_id (osid.id.Id) - the Id of the AssessmentOffered
```

Returns the assessment offered form

Return type osid.assessment.AssessmentOfferedForm

Raise NotFound-assessment\_offered\_id is not found

**Raise** NullArgument - assessment\_offered\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

# Bank.update\_assessment\_offered(assessment\_offered\_form)

Updates an existing assessment offered.

Parameters assessment_offered_form(osid.assessment.AssessmentOfferedForm) - the form containing the elements to be updated
Raise IllegalState - assessment_offrered_form already used in an update transaction
Raise InvalidArgument - the form contains an invalid value
<b>Raise</b> NullArgument - assessment_offered_form is null
Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

Raise Unsupported - assessment\_form did not originate from
get\_assessment\_form\_for\_update()

compliance: mandatory – This method must be implemented.

#### Bank.can\_delete\_assessments\_offered()

Tests if this user can delete AssessmentsOffered.

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting an AssessmentOffered will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer a delete operations to unauthorized users.

Returns false if AssessmentOffered deletion is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Bank.delete\_assessment\_offered(assessment\_offered\_id)

Deletes an AssessmentOffered.

**Parameters assessment\_offered\_id** (osid.id.Id) - the Id of the AssessmentOffered to remove

**Raise** NotFound-assessment\_offered\_id not found

**Raise** NullArgument - assessment\_offered\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

### Bank.can\_manage\_assessment\_offered\_aliases()

Tests if this user can manage Id aliases for AssessmentsOffered.

A return of true does not guarantee successful authorization. A return of false indicates that it is known changing an alias will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer alias operations to an unauthorized user.

**Returns** false if AssessmentOffered aliasing is not authorized, true otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

Bank.alias\_assessment\_offered(assessment\_offered\_id, alias\_id)

Adds an Id to an AssessmentOffered for the purpose of creating compatibility.

The primary Id of the AssessmentOffered is determined by the provider. The new Id is an alias to the primary Id. If the alias is a pointer to another assessment offered, it is reassigned to the given assessment offered Id.

Parameters

- assessment\_offered\_id (osid.id.Id) the Id of an AssessmentOffered
- alias\_id (osid.id.Id) the alias Id

Raise AlreadyExists - alias\_id is in use as a primary Id

**Raise** NotFound - assessment\_offered\_id not found

Raise NullArgument - assessment\_offered\_id or alias\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

# **Assessment Offered Bank Methods**

#### Bank.can\_lookup\_assessment\_offered\_bank\_mappings()

Tests if this user can perform lookups of assessment offered/bank mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known lookup methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

**Returns** false if looking up mappings is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### Bank.use\_comparative\_bank\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as assessment, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

#### Bank.use\_plenary\_bank\_view()

A complete view of the AssessmentTaken and Bank returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

### Bank.get\_assessment\_offered\_ids\_by\_bank(bank\_id)

Gets the list of AssessmentOffered Ids associated with a Bank.

Parameters bank\_id (osid.id.Id) - Id of the Bank

Returns list of related assessment offered Ids

Return type osid.id.IdList

Raise NotFound - bank\_id is not found

Raise NullArgument - bank\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

*compliance: mandatory – This method must be implemented.* 

#### Bank.get\_assessments\_offered\_by\_bank(bank\_id)

Gets the list of AssessmentOffereds associated with a Bank.

Parameters bank\_id (osid.id.Id) - Id of the Bank

**Returns** list of related assessments offered

Return type osid.assessment.AssessmentOfferedList

**Raise** NotFound – bank\_id is not found

**Raise** NullArgument - bank\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

```
Bank.get_assessment_offered_ids_by_banks(bank_ids)
```

Gets the list of AssessmentOffered Ids corresponding to a list of Banks.

Parameters bank\_ids (osid.id.IdList) - list of bank Ids

Returns list of bank Ids

Return type osid.id.IdList

Raise NullArgument - bank\_ids is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

```
Bank.get_assessments_offered_by_banks(bank_ids)
```

Gets the list of AssessmentOffered objects corresponding to a list of Banks.

Parameters bank\_ids (osid.id.IdList) - list of bank Ids

**Returns** list of assessments offered

Return type osid.assessment.AssessmentOfferedList

**Raise** NullArgument - bank\_ids is null

Raise OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.get\_bank\_ids\_by\_assessment\_offered (assessment\_offered\_id) Gets the list of Bank Ids mapped to an AssessmentOffered.

**Parameters assessment\_offered\_id** (osid.id.Id) - Id of an AssessmentOffered

Returns list of bank Ids

Return type osid.id.IdList

**Raise** NotFound - assessment\_offered\_id is not found

**Raise** NullArgument - assessment\_offered\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

```
Bank.get_banks_by_assessment_offered (assessment_offered_id)
Gets the list of Banks mapped to an AssessmentOffered.
```

**Parameters assessment\_offered\_id** (osid.id.Id) - Id of an AssessmentOffered

Returns list of banks

Return type osid.assessment.BankList

**Raise** NotFound-assessment\_offered\_id is not found

Raise NullArgument - assessment\_offered\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

### Assessment Offered Bank Assignment Methods

#### Bank.can\_assign\_assessments\_offered()

Tests if this user can alter assessment offered/bank mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known mapping methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

**Returns** false if mapping is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
Bank.can_assign_assessments_offered_to_bank(bank_id)
```

Tests if this user can alter assessment offered/bank mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known mapping methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

Parameters bank\_id (osid.id.Id) - the Id of the Bank

**Returns** false if mapping is not authorized, true otherwise

Return type boolean

Raise NullArgument - bank\_id is null

compliance: mandatory – This method must be implemented.

#### Bank.get\_assignable\_bank\_ids(bank\_id)

Gets a list of banks including and under the given banks node in which any assessment taken can be assigned.

Parameters bank\_id (osid.id.Id) - the Id of the Bank

**Returns** list of assignable bank Ids

Return type osid.id.IdList

Raise NullArgument - bank\_id is null

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

Bank.get\_assignable\_bank\_ids\_for\_assessment\_offered(bank\_id, assess-

*ment\_offered\_id*)

Gets a list of bank including and under the given bank node in which a specific assessment offered can be assigned.

#### **Parameters**

- bank\_id (osid.id.Id) the Id of the Bank
- assessment\_offered\_id (osid.id.Id) the Id of the AssessmentOffered

**Returns** list of assignable bank Ids

Return type osid.id.IdList

Raise NullArgument - bank\_id or assessment\_offered\_id is null

**Raise** OperationFailed – unable to complete request

*compliance: mandatory – This method must be implemented.* 

Bank.assign\_assessment\_offered\_to\_bank (assessment\_offered\_id, bank\_id)

Adds an existing AssessmentOffered to a Bank.

### Parameters

- assessment\_offered\_id (osid.id.Id) the Id of the AssessmentOffered
- bank\_id (osid.id.Id) the Id of the Bank

**Raise** AlreadyExists - assessment\_offered\_id is already assigned to bank\_id

Raise NotFound - assessment\_offered\_id or bank\_id not found

Raise NullArgument - assessment\_offered\_id or bank\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.unassign\_assessment\_offered\_from\_bank (assessment\_offered\_id, bank\_id) Removes an AssessmentOffered from a Bank.

#### **Parameters**

- assessment\_offered\_id (osid.id.Id) the Id of the AssessmentOffered
- **bank\_id** (osid.id.Id) the Id of the Bank
- Raise NotFound assessment\_offered\_id or bank\_id not found or assessment\_offered\_id not assigned to bank\_id
- **Raise** NullArgument assessment\_offered\_id or bank\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.reassign\_assessment\_offered\_to\_billing (assessment\_offered\_id,

from\_bank\_id, to\_bank\_id)

Moves an AssessmentOffered from one Bank to another.

Mappings to other Banks are unaffected.

**Parameters** 

- assessment\_offered\_id (osid.id.Id) the Id of the AssessmentOffered
- from\_bank\_id (osid.id.Id) the Id of the current Bank
- to\_bank\_id (osid.id.Id) the Id of the destination Bank

Raise NotFound - assessment\_offered\_id, from\_bank\_id, or to\_bank\_id not found or assessment\_offered\_id not mapped to from\_bank\_id

Raise NullArgument - assessment\_offered\_id, from\_bank\_id, or to\_bank\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

### Assessment Taken Lookup Methods

### Bank.bank\_id

Gets the Bank Id associated with this session.

Returns the Bank Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

### Bank.bank

Gets the Bank associated with this session.

Returns the Bank associated with this session

Return type osid.assessment.Bank

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

### Bank.can\_lookup\_assessments\_taken()

Tests if this user can perform AssessmentTaken lookups.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

Returns false if lookup methods are not authorized, true otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

# Bank.use\_comparative\_assessment\_taken\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as assessment, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory - This method is must be implemented.

```
Bank.use_plenary_assessment_taken_view()
```

A complete view of the AssessmentTaken returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

## Bank.use\_federated\_bank\_view()

Federates the view for methods in this session.

A federated view will include assessments taken in banks which are children of this bank in the bank hierarchy.

compliance: mandatory – This method is must be implemented.

#### Bank.use\_isolated\_bank\_view()

Isolates the view for methods in this session.

An isolated view restricts searches to this bank only.

compliance: mandatory – This method is must be implemented.

```
Bank.get_assessment_taken(assessment_taken_id)
```

Gets the AssessmentTaken specified by its Id.

In plenary mode, the exact Id is found or a NotFound results. Otherwise, the returned AssessmentTaken may have a different Id than requested, such as the case where a duplicate Id was assigned to an AssessmentTaken and retained for compatibility.

Parameters assessment_taken_id	(osid.id.Id)	-	Id	of	the
AssessmentTaken					

Returns the assessment taken

Return type osid.assessment.AssessmentTaken

**Raise** NotFound - assessment\_taken\_id not found

**Raise** NullArgument - assessment\_taken\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method is must be implemented.

Bank.get\_assessments\_taken\_by\_ids(assessment\_taken\_ids)

Gets an AssessmentTakenList corresponding to the given IdList.

In plenary mode, the returned list contains all of the assessments specified in the Id list, in the order of the list, including duplicates, or an error results if an Id in the supplied list is not found or inaccessible. Otherwise, inaccessible AssessmentTaken objects may be omitted from the list and may present the elements in any order including returning a unique set.

Parameters assessment\_taken\_ids (osid.id.IdList) - the list of Ids to retrieve

Returns the returned AssessmentTaken list

Return type osid.assessment.AssessmentTakenList

Raise NotFound - an Id was not found

**Raise** NullArgument - assessment\_taken\_ids is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – assessment failure

*compliance: mandatory – This method must be implemented.* 

Bank.get\_assessments\_taken\_by\_genus\_type (assessment\_taken\_genus\_type)

Gets an AssessmentTakenList corresponding to the given assessment taken genus Type which does not include assessments of types derived from the specified Type.

In plenary mode, the returned list contains all known assessments taken or an error results. Otherwise, the returned list may contain only those assessments taken that are accessible through this session.

Parameters assessment\_taken\_genus\_type (osid.type.Type) - an assessment taken genus type

Returns the returned AssessmentTaken list

Return type osid.assessment.AssessmentTakenList

Raise NullArgument - assessment\_taken\_genus\_type is null

Raise OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.get\_assessments\_taken\_by\_parent\_genus\_type (assessment\_taken\_genus\_type) Gets an AssessmentTakenList corresponding to the given assessment taken genus Type and include any additional assessments with genus types derived from the specified Type.

In plenary mode, the returned list contains all known assessments or an error results. Otherwise, the returned list may contain only those assessments taken that are accessible through this session.

Parameters assessment\_taken\_genus\_type (osid.type.Type) - an assessment taken genus type

**Returns** the returned AssessmentTaken list

Return type osid.assessment.AssessmentTakenList

**Raise** NullArgument - assessment\_taken\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.get\_assessments\_taken\_by\_record\_type(assessment\_taken\_record\_type)

Gets an AssessmentTakenList corresponding to the given assessment taken record Type.

The set of assessments implementing the given record type is returned. In plenary mode, the returned list contains all known assessments taken or an error results. Otherwise, the returned list may contain only those assessments taken that are accessible through this session. In both cases, the order of the set is not specified.

**Parameters assessment\_taken\_record\_type** (osid.type.Type) - an assessment taken record type

Returns the returned AssessmentTaken list

Return type osid.assessment.AssessmentTakenList

**Raise** NullArgument - assessment\_taken\_record\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

*compliance: mandatory – This method must be implemented.* 

### Bank.get\_assessments\_taken\_by\_date (from\_, to)

Gets an AssessmentTakenList started in the given date range inclusive.

In plenary mode, the returned list contains all known assessments taken or an error results. Otherwise, the returned list may contain only those assessments taken that are accessible through this session. In both cases, the order of the set is not specified.

### **Parameters**

- from (osid.calendaring.DateTime) start date
- to (osid.calendaring.DateTime) end date

Returns the returned AssessmentTaken list

Return type osid.assessment.AssessmentTakenList

Raise InvalidArgument - from is greater than to

Raise NullArgument - from or to is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

#### Bank.get\_assessments\_taken\_for\_taker(resource\_id)

Gets an AssessmentTakenList for the given resource.

In plenary mode, the returned list contains all known assessments taken or an error results. Otherwise, the returned list may contain only those assessments taken that are accessible through this session.

Parameters resource\_id (osid.id.Id) - Id of a Resource

Returns the returned AssessmentTaken list

Return type osid.assessment.AssessmentTakenList

**Raise** NullArgument - resource\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

```
Bank.get_assessments_taken_by_date_for_taker(resource_id, from_, to)
```

Gets an AssessmentTakenList started in the given date range inclusive for the given resource.

In plenary mode, the returned list contains all known assessments taken or an error results. Otherwise, the returned list may contain only those assessments taken that are accessible through this session.

### Parameters

- resource\_id (osid.id.Id) Id of a Resource
- from (osid.calendaring.DateTime) start date
- **to** (osid.calendaring.DateTime) end date

Returns the returned AssessmentTaken list

Return type osid.assessment.AssessmentTakenList

**Raise** InvalidArgument – from is greater than to

Raise NullArgument - resource\_id, from or to is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

*compliance: mandatory – This method must be implemented.* 

## Bank.get\_assessments\_taken\_for\_assessment(assessment\_id)

Gets an AssessmentTakenList for the given assessment.

In plenary mode, the returned list contains all known assessments taken or an error results. Otherwise, the returned list may contain only those assessments taken that are accessible through this session.

Parameters assessment\_id (osid.id.Id) - Id of an Assessment

Returns the returned AssessmentTaken list

Return type osid.assessment.AssessmentTakenList

**Raise** NullArgument - assessment\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

### Bank.get\_assessments\_taken\_by\_date\_for\_assessment (assessment\_id, from\_,

Gets an AssessmentTakenList started in the given date range inclusive for the given assessment.

In plenary mode, the returned list contains all known assessments taken or an error results. Otherwise, the returned list may contain only those assessments taken that are accessible through this session.

### **Parameters**

- assessment\_id (osid.id.Id) Id of an Assessment
- from (osid.calendaring.DateTime) start date
- to (osid.calendaring.DateTime) end date

Returns the returned AssessmentTaken list

Return type osid.assessment.AssessmentTakenList

Raise InvalidArgument - from is greater than to

**Raise** NullArgument - assessment\_id, from or to is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.get\_assessments\_taken\_for\_taker\_and\_assessment (resource\_id, assess-

ment\_id)

Gets an AssessmentTakenList for the given resource and assessment.

In plenary mode, the returned list contains all known assessments taken or an error results. Otherwise, the returned list may contain only those assessments taken that are accessible through this session.

## **Parameters**

• resource\_id(osid.id.Id) - Id of a Resource

• assessment\_id (osid.id.Id) - Id of an Assessment

Returns the returned Assessment Taken list

Return type osid.assessment.AssessmentTakenList

Raise NullArgument - resource\_id or assessment\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.get\_assessments\_taken\_by\_date\_for\_taker\_and\_assessment (resource\_id,

assessment\_id, from\_,

to)

Gets an AssessmentTakenList started in the given date range inclusive for the given resource and assessment.

In plenary mode, the returned list contains all known assessments taken or an error results. Otherwise, the returned list may contain only those assessments taken that are accessible through this session.

## **Parameters**

- resource\_id(osid.id.Id) Id of a Resource
- assessment\_id (osid.id.Id) Id of an Assessment
- from (osid.calendaring.DateTime) start date
- **to** (osid.calendaring.DateTime) end date

Returns the returned AssessmentTaken list

Return type osid.assessment.AssessmentTakenList

Raise InvalidArgument - from is greater than to

Raise NullArgument-resource\_id, assessment\_id, from or to is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.get\_assessments\_taken\_for\_assessment\_offered (assessment\_offered\_id) Gets an AssessmentTakenList by the given assessment offered.

In plenary mode, the returned list contains all known assessments taken or an error results. Otherwise, the returned list may contain only those assessments taken that are accessible through this session.

```
Parameters assessment_offered_id (osid.id.Id) - Id of an AssessmentOffered
```

Returns the returned AssessmentTaken list

Return type osid.assessment.AssessmentTakenList

Raise NullArgument - assessment\_offered\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

### Bank.get\_assessments\_taken\_by\_date\_for\_assessment\_offered (assessment\_offered\_id,

Gets an AssessmentTakenList started in the given date range inclusive for the given assessment offered.

In plenary mode, the returned list contains all known assessments taken or an error results. Otherwise, the returned list may contain only those assessments taken that are accessible through this session.

### **Parameters**

- assessment\_offered\_id (osid.id.Id) Id of an AssessmentOffered
- from (osid.calendaring.DateTime) start date
- to (osid.calendaring.DateTime) end date

Returns the returned AssessmentTaken list

Return type osid.assessment.AssessmentTakenList

**Raise** InvalidArgument – from is greater than to

Raise NullArgument - assessment\_offered\_id, from, or to is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

#### Bank.get\_assessments\_taken\_for\_taker\_and\_assessment\_offered(resource\_id,

assess-

from , to)

*ment\_offered\_id*)

Gets an AssessmentTakenList for the given resource and assessment offered.

In plenary mode, the returned list contains all known assessments taken or an error results. Otherwise, the returned list may contain only those assessments taken that are accessible through this session.

#### **Parameters**

- **resource\_id** (osid.id.Id) Id of a Resource
- assessment\_offered\_id (osid.id.Id) Id of an AssessmentOffered

 $Returns \ the \ returned \ {\tt Assessment Taken } list$ 

Return type osid.assessment.AssessmentTakenList

Raise NullArgument - resource\_id or assessmen\_offeredt\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

*compliance: mandatory – This method must be implemented.* 

### Bank.get\_assessments\_taken\_by\_date\_for\_taker\_and\_assessment\_offered (resource\_id,

```
as-
sess-
ment_offered_id,
```

from\_,

to) Gets an AssessmentTakenList started in the given date range inclusive for the given resource and assessment offered.

In plenary mode, the returned list contains all known assessments taken or an error results. Otherwise, the returned list may contain only those assessments taken that are accessible through this session.

#### **Parameters**

- resource\_id(osid.id.Id) Id of a Resource
- assessment\_offered\_id (osid.id.Id) Id of an AssessmentOffered
- from (osid.calendaring.DateTime) start date
- to (osid.calendaring.DateTime) end date

Returns the returned AssessmentTaken list

Return type osid.assessment.AssessmentTakenList

Raise InvalidArgument - from is greater than to

Raise NullArgument - resource\_id, assessment\_offered\_id, from, or to is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

#### Bank.assessments\_taken

Gets all AssessmentTaken elements.

In plenary mode, the returned list contains all known assessments taken or an error results. Otherwise, the returned list may contain only those assessments taken that are accessible through this session.

**Returns** a list of AssessmentTaken elements

Return type osid.assessment.AssessmentTakenList

Raise OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

### Assessment Taken Query Methods

Bank.bank\_id

Gets the Bank Id associated with this session.

Returns the Bank Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

### Bank.bank

Gets the Bank associated with this session.

Returns the Bank associated with this session

Return type osid.assessment.Bank

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

### Bank.can\_search\_assessments\_taken()

Tests if this user can perform AssessmentTaken searches.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer search operations to unauthorized users.

Returns false if search methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## Bank.use\_federated\_bank\_view()

Federates the view for methods in this session.

A federated view will include assessments taken in banks which are children of this bank in the bank hierarchy.

compliance: mandatory – This method is must be implemented.

## Bank.use\_isolated\_bank\_view()

Isolates the view for methods in this session.

An isolated view restricts searches to this bank only.

compliance: mandatory – This method is must be implemented.

### Bank.assessment\_taken\_query

Gets an assessment taken query.

**Returns** the assessment taken query

Return type osid.assessment.AssessmentTakenQuery

compliance: mandatory – This method must be implemented.

### Bank.get\_assessments\_taken\_by\_query(assessment\_taken\_query)

Gets a list of AssessmentTaken elements matching the given assessment taken query.

Parameters assessment\_taken\_query

(osid.assessment.

AssessmentTakenQuery) - the assessment taken query

Returns the returned AssessmentTakenList

**Return type** osid.assessment.AssessmentTakenList

**Raise** NullArgument - assessment\_taken\_query is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

**Raise** Unsupported – assessment\_taken\_query is not of this service

compliance: mandatory – This method must be implemented.

## **Assessment Taken Admin Methods**

#### Bank.bank\_id

Gets the Bank Id associated with this session.

Returns the Bank Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### Bank.bank

Gets the Bank associated with this session.

Returns the Bank associated with this session

Return type osid.assessment.Bank

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

#### Bank.can\_create\_assessments\_taken()

Tests if this user can create Assessment Taken objects.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating an AssessmentTaken will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer create operations to an unauthorized user.

Returns false if AssessmentTaken creation is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Bank.can\_create\_assessment\_taken\_with\_record\_types (assessment\_taken\_record\_types) Tests if this user can create a single AssessmentTaken using the desired record types.

While AssessmentManager.getAssessmentTakenRecordTypes() can be used to examine which records are supported, this method tests which record(s) are required for creating a specific AssessmentTaken. Providing an empty array tests if an AssessmentTaken can be created with no records.

**Parameters assessment\_taken\_record\_types** (osid.type.Type[]) - array of assessment taken record types

**Returns** true if AssessmentTaken creation using the specified record Types is supported, false otherwise

Return type boolean

 $Raise \ \texttt{NullArgument-assessment\_taken\_record\_types} is \ \texttt{null}$ 

compliance: mandatory – This method must be implemented.

```
Bank.get_assessment_taken_form_for_create(assessment_offered_id, assess-
ment_taken_record_types)
```

Gets the assessment taken form for creating new assessments taken.

A new form should be requested for each create transaction.

#### **Parameters**

- assessment\_offered\_id (osid.id.Id) the Id of the related AssessmentOffered
- **assessment\_taken\_record\_types** (osid.type.Type[]) array of assessment taken record types to be included in the create operation or an empty list if none

Returns the assessment taken form

Return type osid.assessment.AssessmentTakenForm

Raise NotFound-assessment\_offered\_id is not found

Raise NullArgument - assessment\_offered\_id or assessment\_taken\_record\_types is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

Raise Unsupported – unable to get form for requested record types

compliance: mandatory – This method must be implemented.

#### Bank.create\_assessment\_taken(assessment\_taken\_form)

Creates a new AssessmentTaken.

```
Parameters assessment_taken_form (osid.assessment.
AssessmentTakenForm) - the form for this AssessmentTaken
```

Returns the new AssessmentTaken

Return type osid.assessment.AssessmentTaken

**Raise** IllegalState - assessment\_taken\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

Raise NullArgument - assessment\_taken\_form is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure occurred

Raise Unsupported - assessment\_offered\_form did not originate from
 get\_assessment\_taken\_form\_for\_create()

compliance: mandatory – This method must be implemented.

## Bank.can\_update\_assessments\_taken()

Tests if this user can update Assessment Taken objects.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating an AssessmentTaken will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer update operations to an unauthorized user.

Returns false if AssessmentTaken modification is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Bank.get\_assessment\_taken\_form\_for\_update (assessment\_taken\_id) Gets the assessment taken form for updating an existing assessment taken.

A new assessment taken form should be requested for each update transaction.

Parameters assessment\_taken\_id (osid.id.Id) - the Id of the
AssessmentTaken

Returns the assessment taken form

Return type osid.assessment.AssessmentTakenForm

**Raise** NotFound - assessment\_taken\_id is not found

**Raise** NullArgument - assessment\_taken\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

### Bank.update\_assessment\_taken (assessment\_taken\_form)

Updates an existing assessment taken.

Parameters assessment\_taken\_form(osid.assessment.AssessmentTakenForm) - the form containing the elements to be updated

**Raise** IllegalState - assessment\_taken\_form already used in an update transaction

Raise InvalidArgument - the form contains an invalid value

Raise NullArgument - assessment\_taken\_form is null

Raise OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

**Raise** Unsupported – assessment\_offered\_form did not originate from get\_assessment\_taken\_form\_for\_update()

compliance: mandatory – This method must be implemented.

#### Bank.can\_delete\_assessments\_taken()

Tests if this user can delete AssessmentsTaken.

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting an AssessmentTaken will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer a delete operations to unauthorized users.

**Returns** false if AssessmentTaken deletion is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
Bank.delete_assessment_taken (assessment_taken_id)
```

Deletes an AssessmentTaken.

**Parameters** assessment\_taken\_id (osid.id.Id) - the Id of the AssessmentTaken to remove

**Raise** NotFound-assessment\_taken\_id not found

**Raise** NullArgument - assessment\_taken\_id is null

Raise OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory - This method must be implemented.

### Bank.can\_manage\_assessment\_taken\_aliases()

Tests if this user can manage Id aliases for AssessmentsTaken.

A return of true does not guarantee successful authorization. A return of false indicates that it is known changing an alias will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer alias operations to an unauthorized user.

Returns false if AssessmentTaken aliasing is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Bank.alias\_assessment\_taken(assessment\_taken\_id, alias\_id)

Adds an Id to an AssessmentTaken for the purpose of creating compatibility.

The primary Id of the AssessmentTaken is determined by the provider. The new Id is an alias to the primary Id. If the alias is a pointer to another assessment taken, it is reassigned to the given assessment taken Id.

### Parameters

- assessment\_taken\_id(osid.id.Id)-the Id of an AssessmentTaken
- alias\_id (osid.id.Id) the alias Id

Raise AlreadyExists - alias\_id is in use as a primary Id

Raise NotFound-assessment\_taken\_id not found

Raise NullArgument - assessment\_taken\_id or alias\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

### **Assessment Taken Bank Methods**

#### Bank.can\_lookup\_assessment\_taken\_bank\_mappings()

Tests if this user can perform lookups of assessment taken/bank mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known lookup methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

Returns false if looking up mappings is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### Bank.use\_comparative\_bank\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as assessment, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

Bank.use\_plenary\_bank\_view()

A complete view of the AssessmentTaken and Bank returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

Bank.get\_assessment\_taken\_ids\_by\_bank (*bank\_id*) Gets the list of AssessmentTaken Ids associated with a Bank.

**Parameters bank\_id** (osid.id.Id) – Id of the Bank

Returns list of related assessment taken Ids

Return type osid.id.IdList

**Raise** NotFound – bank\_id is not found

Raise NullArgument - bank\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

## Bank.get\_assessments\_taken\_by\_bank(bank\_id)

Gets the list of AssessmentTakens associated with a Bank.

Parameters bank\_id (osid.id.Id) - Id of the Bank

Returns list of related assessments taken

Return type osid.assessment.AssessmentTakenList

Raise NotFound - bank\_id is not found

**Raise** NullArgument - bank\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.get\_assessment\_taken\_ids\_by\_banks(bank\_ids)

Gets the list of AssessmentTaken Ids corresponding to a list of Banks.

Parameters bank\_ids (osid.id.IdList) - list of bank Ids

Returns list of bank Ids

Return type osid.id.IdList

**Raise** NullArgument - bank\_ids is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

compliance: mandatory – This method must be implemented.

## Bank.get\_assessments\_taken\_by\_banks(bank\_ids)

Gets the list of AssessmentTaken objects corresponding to a list of Banks.

Parameters bank\_ids (osid.id.IdList) - list of bank Ids

Returns list of assessments taken

Return type osid.assessment.AssessmentTakenList **Raise** NullArgument - bank\_ids is null **Raise** OperationFailed – unable to complete request **Raise** PermissionDenied – authorization failure occurred compliance: mandatory – This method must be implemented. Bank.get bank ids by assessment taken (assessment taken id) Gets the list of Bank Ids mapped to an AssessmentTaken. Parameters assessment\_taken\_id (osid.id.Id) -Id of an AssessmentTaken Returns list of bank Ids Return type osid.id.IdList Raise NotFound-assessment\_taken\_id is not found **Raise** NullArgument - assessment\_taken\_id is null **Raise** OperationFailed – unable to complete request **Raise** PermissionDenied – authorization failure occurred compliance: mandatory – This method must be implemented. Bank.get banks by assessment taken (assessment taken id) Gets the list of Banks mapped to an AssessmentTaken. Parameters assessment\_taken\_id Тd of (osid.id.Id) an AssessmentTaken **Returns** list of banks Return type osid.assessment.BankList Raise NotFound - assessment\_taken\_id is not found **Raise** NullArgument - assessment\_taken\_id is null **Raise** OperationFailed – unable to complete request **Raise** PermissionDenied – authorization failure occurred compliance: mandatory – This method must be implemented.

## **Assessment Taken Bank Assignment Methods**

```
Bank.can_assign_assessments_taken()
```

Tests if this user can alter assessment taken/bank mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known mapping methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

**Returns** false if mapping is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## Bank.can\_assign\_assessments\_taken\_to\_bank(bank\_id)

Tests if this user can alter assessment taken/bank mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known mapping methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

Parameters bank\_id (osid.id.Id) - the Id of the Bank

**Returns** false if mapping is not authorized, true otherwise

Return type boolean

Raise NullArgument - bank\_id is null

compliance: mandatory – This method must be implemented.

#### Bank.get\_assignable\_bank\_ids(bank\_id)

Gets a list of banks including and under the given banks node in which any assessment taken can be assigned.

Parameters bank\_id (osid.id.Id) - the Id of the Bank

Returns list of assignable bank Ids

Return type osid.id.IdList

Raise NullArgument - bank\_id is null

Raise OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

```
Bank.get_assignable_bank_ids_for_assessment_taken(bank_id, assess-
```

ment\_taken\_id)

Gets a list of bank including and under the given bank node in which a specific assessment taken can be assigned.

#### **Parameters**

- bank\_id (osid.id.Id) the Id of the Bank
- assessment\_taken\_id (osid.id.Id) the Id of the AssessmentTaken

Returns list of assignable bank Ids

Return type osid.id.IdList

**Raise** NullArgument - bank\_id or assessment\_taken\_id is null

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

```
Bank.assign_assessment_taken_to_bank (assessment_taken_id, bank_id)
Adds an existing AssessmentTaken to a Bank.
```

#### **Parameters**

- assessment\_taken\_id (osid.id.Id) the Id of the AssessmentTaken
- **bank\_id** (osid.id.Id) the Id of the Bank

Raise AlreadyExists - assessment\_taken\_id is already assigned to bank\_id

Raise NotFound-assessment\_taken\_id or bank\_id not found

**Raise** NullArgument - assessment\_taken\_id or bank\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

```
Bank.unassign_assessment_taken_from_bank (assessment_taken_id, bank_id)
Removes an AssessmentTaken from a Bank.
```

**Parameters** 

• assessment\_taken\_id (osid.id.Id) - the Id of the AssessmentTaken

• **bank\_id** (osid.id.Id) - the Id of the Bank

Raise NotFound - assessment\_taken\_id or bank\_id not found or assessment\_taken\_id not assigned to bank\_id

**Raise** NullArgument - assessment\_taken\_id or bank\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

compliance: mandatory – This method must be implemented.

Bank.reassign\_assessment\_taken\_to\_billing(assessment\_taken\_id,

from\_bank\_id, to\_bank\_id)

Moves an AssessmentTaken from one Bank to another.

Mappings to other Banks are unaffected.

#### **Parameters**

- assessment\_taken\_id (osid.id.Id) the Id of the AssessmentTaken
- from\_bank\_id (osid.id.Id) the Id of the current Bank
- to\_bank\_id (osid.id.Id) the Id of the destination Bank
- Raise NotFound assessment\_taken\_id, from\_bank\_id, or to\_bank\_id not found or assessment\_taken\_id not mapped to from\_bank\_id
- Raise NullArgument assessment\_taken\_id, from\_bank\_id, or to\_bank\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

# Objects

## Question

```
class dlkit.assessment.objects.Question
Bases: dlkit.osid.objects.OsidObject
```

A Question represents the question portion of an assessment item.

Like all OSID objects, a Question is identified by its Id and any persisted references should use the Id.

### get\_question\_record(question\_record\_type)

Gets the item record corresponding to the given Question record Type.

This method is used to retrieve an object implementing the requested record. The question\_record\_type may be the Type returned in get\_record\_types() or any of its parents in a Type hierarchy where has\_record\_type(question\_record\_type) is true.

Parameters question\_record\_type (osid.type.Type) - the type of the record to retrieve

Returns the question record

Return type osid.assessment.records.QuestionRecord

**Raise** NullArgument - question\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type (question\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Question Form**

class dlkit.assessment.objects.QuestionForm

Bases: dlkit.osid.objects.OsidObjectForm

This is the form for creating and updating Questions.

get\_question\_form\_record(question\_record\_type)

Gets the QuestionFormRecord corresponding to the given question record Type.

Parameters question\_record\_type (osid.type.Type) - the question record type

**Returns** the question record

Return type osid.assessment.records.QuestionFormRecord

**Raise** NullArgument - question\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type (question\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Question List**

```
class \, \texttt{dlkit.assessment.objects.QuestionList}
```

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, QuestionList provides a means for accessing Question elements sequentially either one at a time or many at a time.

Examples: while (ql.hasNext()) { Question question = ql.getNextQuestion(); }

or

```
while (ql.hasNext()) { Question[] question = al.getNextQuestions(ql.available());
```

}

#### next\_question

Gets the next Question in this list.

**Returns** the next Question in this list. The has\_next() method should be used to test that a next Question is available before calling this method.

Return type osid.assessment.Question

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

#### get\_next\_questions (n)

Gets the next set of Question elements in this list which must be less than or equal to the number returned from available().

- **Parameters n** (cardinal) the number of Question elements requested which should be less than or equal to available()
- **Returns** an array of Question elements. The length of the array is less than or equal to the number specified.

Return type osid.assessment.Question

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

### Answer

#### class dlkit.assessment.objects.Answer

Bases: dlkit.osid.objects.OsidObject

An Answer represents the question portion of an assessment item.

Like all OSID objects, an Answer is identified by its Id and any persisted references should use the Id.

```
get_answer_record (answer_record_type)
```

Gets the answer record corresponding to the given Answer record Type.

This method is used to retrieve an object implementing the requested records. The answer\_record\_type may be the Type returned in get\_record\_types() or any of its parents in a Type hierarchy where has\_record\_type(answer\_record\_type) is true.

Parameters answer\_record\_type (osid.type.Type) - the type of the record to retrieve

Returns the answer record

Return type osid.assessment.records.AnswerRecord

Raise NullArgument - answer\_record\_type is null

Raise OperationFailed - unable to complete request

Raise Unsupported - has\_record\_type (answer\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Answer Form**

```
class dlkit.assessment.objects.AnswerForm
Bases: dlkit.osid.objects.OsidObjectForm
```

This is the form for creating and updating Answers.

get\_answer\_form\_record (answer\_record\_type)
Gets the AnswerFormRecord corresponding to the given answer record Type.

Parameters answer\_record\_type (osid.type.Type) - the answer record type

Returns the answer record

Return type osid.assessment.records.AnswerFormRecord

**Raise** NullArgument - answer\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type (answer\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Answer List**

class dlkit.assessment.objects.AnswerList

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, AnswerList provides a means for accessing Answer elements sequentially either one at a time or many at a time.

Examples: while (al.hasNext()) { Answer answer = al.getNextAnswer(); }

or

while (al.hasNext()) { Answer[] answer = al.getNextAnswers(al.available());

}

## next\_answer

Gets the next Answer in this list.

**Returns** the next Answer in this list. The has\_next() method should be used to test that a next Answer is available before calling this method.

Return type osid.assessment.Answer

Raise IllegalState - no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

## get\_next\_answers (n)

Gets the next set of Answer elements in this list which must be less than or equal to the number returned from available().

- **Parameters n** (cardinal) the number of Answer elements requested which should be less than or equal to available ()
- **Returns** an array of Answer elements. The length of the array is less than or equal to the number specified.

Return type osid.assessment.Answer

**Raise** IllegalState – no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

## Item

class dlkit.assessment.objects.Item

Bases: dlkit.osid.objects.OsidObject, dlkit.osid.markers.Aggregateable

An Item represents an individual assessment item such as a question.

Like all OSID objects, a Item is identified by its Id and any persisted references should use the Id.

An Item is composed of a Question and an Answer.

### learning\_objective\_ids

Gets the Ids of any Objectives corresponding to this item.

Returns the learning objective Ids

Return type osid.id.IdList

compliance: mandatory – This method must be implemented.

## learning\_objectives

Gets the any Objectives corresponding to this item.

Returns the learning objectives

Return type osid.learning.ObjectiveList

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

## question\_id

Gets the Id of the Question.

Returns the question Id

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

### question

Gets the question.

**Returns** the question

Return type osid.assessment.Question

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

### answer\_ids

Gets the Ids of the answers.

Questions may have more than one acceptable answer.

Returns the answer Ids

Return type osid.id.IdList

compliance: mandatory – This method must be implemented.

## answers

Gets the answers.

Returns the answers

Return type osid.assessment.AnswerList

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

### get\_item\_record (item\_record\_type)

Gets the item record corresponding to the given Item record Type.

This method is used to retrieve an object implementing the requested records. The item\_record\_type may be the Type returned in get\_record\_types () or any of its parents in a Type hierarchy where has\_record\_type (item\_record\_type) is true.

**Parameters item\_record\_type** (osid.type.Type) - the type of the record to retrieve

Returns the item record

Return type osid.assessment.records.ItemRecord

**Raise** NullArgument - item\_record\_type is null

Raise OperationFailed - unable to complete request

Raise Unsupported - has\_record\_type (item\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Item Form**

class dlkit.assessment.objects.ItemForm

Bases: dlkit.osid.objects.OsidObjectForm, dlkit.osid.objects. OsidAggregateableForm

This is the form for creating and updating Items.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the ItemAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

#### learning\_objectives\_metadata

Gets the metadata for learning objectives.

**Returns** metadata for the learning objectives

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

#### learning\_objectives

#### get\_item\_form\_record (item\_record\_type)

Gets the ItemnFormRecord corresponding to the given item record Type.

**Parameters item\_record\_type** (osid.type.Type) - the item record type

Returns the item record

Return type osid.assessment.records.ItemFormRecord

Raise NullArgument - item\_record\_type is null

Raise OperationFailed – unable to complete request

Raise Unsupported - has\_record\_type (item\_record\_type) is false

compliance: mandatory - This method must be implemented.

### **Item List**

class dlkit.assessment.objects.ItemList

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, ItemList provides a means for accessing Item elements sequentially either one at a time or many at a time.

Examples: while (il.hasNext()) { Item item = il.getNextItem(); }

or

while (il.hasNext()) { Item[] items = il.getNextItems(il.available());

}

## next\_item

Gets the next Item in this list.

**Returns** the next Item in this list. The has\_next() method should be used to test that a next Item is available before calling this method.

Return type osid.assessment.Item

Raise IllegalState - no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

### get\_next\_items (n)

Gets the next set of Item elements in this list which must be less than or equal to the number returned from available().

- Parameters n (cardinal) the number of Item elements requested which should be less
  than or equal to available()
- **Returns** an array of Item elements. The length of the array is less than or equal to the number specified.

Return type osid.assessment.Item

**Raise** IllegalState – no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

## Assessment

class dlkit.assessment.objects.Assessment

Bases: dlkit.osid.objects.OsidObject

An Assessment represents a sequence of assessment items.

Like all OSID objects, an Assessment is identified by its Id and any persisted references should use the Id.

An Assessment may have an accompanying rubric used for assessing performance. The rubric assessment is established canonically in this Assessment.

## level\_id

Gets the Id of a Grade corresponding to the assessment difficulty.

Returns a grade Id

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### level

Gets the Grade corresponding to the assessment difficulty.

Returns the level

Return type osid.grading.Grade

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

### has\_rubric()

Tests if a rubric assessment is associated with this assessment.

**Returns** true if a rubric is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### rubric\_id

Gets the Id of the rubric.

Returns an assessment Id

Return type osid.id.Id

**Raise** IllegalState - has\_rubric() is false

compliance: mandatory – This method must be implemented.

#### rubric

Gets the rubric.

**Returns** the assessment

Return type osid.assessment.Assessment

**Raise** IllegalState - has\_rubric() is false

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

### get\_assessment\_record (assessment\_record\_type)

Gets the assessment record corresponding to the given Assessment record Type.

This method is used to retrieve an object implementing the requested record. The assessment\_record\_type may be the Type returned in get\_record\_types() or any of its parents in a Type hierarchy where has\_record\_type (assessment\_record\_type) is true

**Parameters** assessment\_record\_type (osid.type.Type) - the type of the record to retrieve

**Returns** the assessment record

Return type osid.assessment.records.AssessmentRecord

**Raise** NullArgument - assessment\_record\_type is null

Raise OperationFailed - unable to complete request

Raise Unsupported - has\_record\_type (assessment\_record\_type) is false

compliance: mandatory – This method must be implemented.

## Assessment Form

class dlkit.assessment.objects.AssessmentForm

Bases: dlkit.osid.objects.OsidObjectForm

This is the form for creating and updating Assessments.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the AssessmentAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

## level\_metadata

Gets the metadata for a grade level.

**Returns** metadata for the grade level

**Return type** osid.Metadata

compliance: mandatory – This method must be implemented.

### level

#### rubric\_metadata

Gets the metadata for a rubric assessment.

Returns metadata for the assessment

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

#### rubric

### get\_assessment\_form\_record (assessment\_record\_type)

Gets the AssessmentFormRecord corresponding to the given assessment record Type.

Parameters assessment\_record\_type (osid.type.Type) - the assessment record
type

Returns the assessment record

Return type osid.assessment.records.AssessmentFormRecord

**Raise** NullArgument - assessment\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type (assessment\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Assessment List**

```
class \, \texttt{dlkit.assessment.objects.AssessmentList}
```

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, AssessmentList provides a means for accessing Assessment elements sequentially either one at a time or many at a time.

Examples: while (al.hasNext()) { Assessment assessment = al.getNextAssessment(); }

### or

while (al.hasNext()) { Assessment[] assessments = al.hetNextAssessments(al.available());

### }

### next\_assessment

Gets the next Assessment in this list.

**Returns** the next Assessment in this list. The has\_next() method should be used to test that a next Assessment is available before calling this method.

Return type osid.assessment.Assessment

**Raise** IllegalState – no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

### get\_next\_assessments(n)

Gets the next set of Assessment elements in this list which must be less than or equal to the number returned from available().

- Parameters n (cardinal) the number of Assessment elements requested which should be less than or equal to available()
- **Returns** an array of Assessment elements. The length of the array is less than or equal to the number specified.

Return type osid.assessment.Assessment

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

## **Assessment Offered**

class dlkit.assessment.objects.AssessmentOffered

Bases: dlkit.osid.objects.OsidObject, dlkit.osid.markers.Subjugateable

An AssessmentOffered represents a sequence of assessment items.

Like all OSID objects, an AssessmentOffered is identified by its Id and any persisted references should use the Id.

assessment\_id

Gets the assessment Id corresponding to this assessment offering.

Returns the assessment id

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### assessment

Gets the assessment corresponding to this assessment offereng.

**Returns** the assessment

Return type osid.assessment.Assessment

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

## level\_id

Gets the Id of a Grade corresponding to the assessment difficulty.

**Returns** a grade id

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### level

Gets the Grade corresponding to the assessment difficulty.

Returns the level

Return type osid.grading.Grade

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

#### are\_items\_sequential()

Tests if the items or parts in this assessment are taken sequentially.

**Returns** true if the items are taken sequentially, false if the items can be skipped and revisited

Return type boolean

compliance: mandatory – This method must be implemented.

### are\_items\_shuffled()

Tests if the items or parts appear in a random order.

**Returns** true if the items appear in a random order, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### has\_start\_time()

Tests if there is a fixed start time for this assessment.

**Returns** true if there is a fixed start time, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### start\_time

Gets the start time for this assessment.

**Returns** the designated start time

Return type osid.calendaring.DateTime

**Raise** IllegalState - has\_start\_time() is false

compliance: mandatory – This method must be implemented.

#### has\_deadline()

Tests if there is a fixed end time for this assessment.

Returns true if there is a fixed end time, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## deadline

Gets the end time for this assessment.

**Returns** the designated end time

**Return type** osid.calendaring.DateTime

**Raise** IllegalState - has\_deadline() is false

compliance: mandatory – This method must be implemented.

### has\_duration()

Tests if there is a fixed duration for this assessment.

Returns true if there is a fixed duration, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### duration

Gets the duration for this assessment.

Returns the duration

**Return type** osid.calendaring.Duration

Raise IllegalState - has\_duration() is false

compliance: mandatory – This method must be implemented.

### is\_scored()

Tests if this assessment will be scored.

Returns true if this assessment will be scored false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### score\_system\_id

Gets the grade system Id for the score.

**Returns** the grade system Id

Return type osid.id.Id

**Raise** IllegalState - is\_scored() is false

compliance: mandatory – This method must be implemented.

### score\_system

Gets the grade system for the score.

**Returns** the grade system

Return type osid.grading.GradeSystem

**Raise** IllegalState - is\_scored() is false

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

### is\_graded()

Tests if this assessment will be graded.

**Returns** true if this assessment will be graded, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### grade\_system\_id

Gets the grade system Id for the grade.

Returns the grade system Id

Return type osid.id.Id

**Raise** IllegalState - is\_graded() is false

compliance: mandatory – This method must be implemented.

## grade\_system

Gets the grade system for the grade.

**Returns** the grade system

Return type osid.grading.GradeSystem

**Raise** IllegalState - is\_graded() is false

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

#### has\_rubric()

Tests if a rubric assessment is associated with this assessment.

**Returns** true if a rubric is available, false otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

### rubric\_id

Gets the Id of the rubric.

Returns an assessment offered  ${\tt Id}$ 

Return type osid.id.Id

**Raise** IllegalState - has\_rubric() is false

compliance: mandatory – This method must be implemented.

### rubric

Gets the rubric.

**Returns** the assessment offered

Return type osid.assessment.AssessmentOffered

Raise IllegalState - has\_rubric() is false

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

get\_assessment\_offered\_record (assessment\_taken\_record\_type)

Gets the assessment offered record corresponding to the given AssessmentOffered record Type.

This method is used to retrieve an object implementing the requested record. The assessment\_offered\_record\_type returned be the Type in may qet record types() or any of its parents in а Type hierarchy where has\_record\_type (assessment\_offered\_record\_type) is true.

**Parameters assessment\_taken\_record\_type** (osid.type.Type) - an assessment offered record type

Returns the assessment offered record

Return type osid.assessment.records.AssessmentOfferedRecord

**Raise** NullArgument - assessment\_offered\_record\_type is null

Raise OperationFailed - unable to complete request

Raise Unsupported-has\_record\_type(assessment\_offered\_record\_type)
is false

compliance: mandatory – This method must be implemented.

### **Assessment Offered Form**

class dlkit.assessment.objects.AssessmentOfferedForm

Bases: dlkit.osid.objects.OsidObjectForm, OsidSubjugateableForm

dlkit.osid.objects.

This is the form for creating and updating an AssessmentOffered.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the AssessmentOfferedAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

#### level\_metadata

Gets the metadata for a grade level.

Returns metadata for the grade level

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

### level

items\_sequential\_metadata

Gets the metadata for sequential operation.

**Returns** metadata for the sequential flag

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

### items\_sequential

### items\_shuffled\_metadata

Gets the metadata for shuffling items.

Returns metadata for the shuffled flag

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

## items\_shuffled

### start\_time\_metadata

Gets the metadata for the assessment start time.

Returns metadata for the start time

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

### start\_time

#### deadline\_metadata

Gets the metadata for the assessment deadline.

Returns metadata for the end time

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

### deadline

### duration\_metadata

Gets the metadata for the assessment duration.

Returns metadata for the duration

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

### duration

#### score\_system\_metadata

Gets the metadata for a score system.

Returns metadata for the grade system

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

## score\_system

## grade\_system\_metadata

Gets the metadata for a grading system.

**Returns** metadata for the grade system

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

## grade\_system

### get\_assessment\_offered\_form\_record (assessment\_offered\_record\_type)

Gets the AssessmentOfferedFormRecord corresponding to the given assessment record Type.

**Parameters assessment\_offered\_record\_type** (osid.type.Type) - the assessment offered record type

Returns the assessment offered record

Return type osid.assessment.records.AssessmentOfferedFormRecord

**Raise** NullArgument - assessment\_offered\_record\_type is null

Raise OperationFailed - unable to complete request

Raise Unsupported-has\_record\_type(assessment\_offered\_record\_type)
is false

compliance: mandatory – This method must be implemented.

## **Assessment Offered List**

 $class \, \texttt{dlkit.assessment.objects.AssessmentOfferedList}$ 

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, AssessmentOfferedList provides a means for accessing AssessmentTaken elements sequentially either one at a time or many at a time.

Examples: while (aol.hasNext()) { AssessmentOffered assessment = aol.getNextAssessmentOffered();

or

while (aol.hasNext()) { AssessmentOffered[] assessments = aol.hetNextAssessmentsOffered(aol.available());

.

#### next\_assessment\_offered

Gets the next AssessmentOffered in this list.

**Returns** the next AssessmentOffered in this list. The has\_next() method should be used to test that a next AssessmentOffered is available before calling this method.

Return type osid.assessment.AssessmentOffered

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

#### get\_next\_assessments\_offered(n)

Gets the next set of AssessmentOffered elements in this list which must be less than or equal to the number returned from available().

Parameters n (cardinal) - the number of AssessmentOffered elements requested
 which should be less than or equal to available()

**Returns** an array of AssessmentOffered elements. The length of the array is less than or equal to the number specified.

Return type osid.assessment.AssessmentOffered

**Raise** IllegalState – no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

## Assessment Taken

class dlkit.assessment.objects.AssessmentTaken
 Bases: dlkit.osid.objects.OsidObject

Represents a taken assessment or an assessment in progress.

#### assessment\_offered\_id

Gets the Id of the AssessmentOffered.

Returns the assessment offered Id

**Return type** osid.id.Id

*compliance: mandatory – This method must be implemented.* 

## assessment\_offered

Gets the AssessmentOffered.

Returns the assessment offered

Return type osid.assessment.AssessmentOffered

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

### taker\_id

Gets the Id of the resource who took or is taking this assessment.

**Returns** the resource Id

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### taker

Gets the Resource taking this assessment.

**Returns** the resource

Return type osid.resource.Resource

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

#### taking\_agent\_id

Gets the Id of the Agent who took or is taking the assessment.

Returns the agent  ${\tt Id}$ 

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### taking\_agent

Gets the Agent.

**Returns** the agent

Return type osid.authentication.Agent

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

#### has\_started()

Tests if this assessment has begun.

**Returns** true if the assessment has begun, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

actual\_start\_time

Gets the time this assessment was started.

**Returns** the start time

Return type osid.calendaring.DateTime

**Raise** IllegalState - has\_started() is false

compliance: mandatory – This method must be implemented.

## has\_ended()

Tests if this assessment has ended.

**Returns** true if the assessment has ended, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### completion\_time

Gets the time of this assessment was completed.

**Returns** the end time

Return type osid.calendaring.DateTime

**Raise** IllegalState - has\_ended() is false

*compliance: mandatory – This method must be implemented.* 

#### time\_spent

Gets the total time spent taking this assessment.

**Returns** the total time spent

Return type osid.calendaring.Duration

compliance: mandatory – This method must be implemented.

#### completion

Gets a completion percentage of the assessment.

**Returns** the percent complete (0-100)

Return type cardinal

compliance: mandatory – This method must be implemented.

#### is\_scored()

Tests if a score is available for this assessment.

**Returns** true if a score is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### score\_system\_id

Gets a score system Id for the assessment.

Returns the grade system

Return type osid.id.Id

Raise IllegalState-is\_score() is false

compliance: mandatory – This method must be implemented.

#### score\_system

Gets a grade system for the score.

**Returns** the grade system

**Return type** osid.grading.GradeSystem

**Raise** IllegalState - is\_scored() is false

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

### score

Gets a score for the assessment.

Returns the score

Return type decimal

**Raise** IllegalState - is\_scored() is false

compliance: mandatory – This method must be implemented.

### is\_graded()

Tests if a grade is available for this assessment.

**Returns** true if a grade is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## grade\_id

Gets a grade Id for the assessment.

Returns the grade

Return type osid.id.Id

**Raise** IllegalState - is\_graded() is false

compliance: mandatory – This method must be implemented.

#### grade

Gets a grade for the assessment.

Returns the grade

Return type osid.grading.Grade

**Raise** IllegalState - is\_graded() is false

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

## feedback

Gets any overall comments available for this assessment by the grader.

**Returns** comments

Return type osid.locale.DisplayText

compliance: mandatory – This method must be implemented.

### has\_rubric()

Tests if a rubric assessment is associated with this assessment.

Returns true if a rubric is available, false otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

### rubric\_id

Gets the Id of the rubric.

**Returns** an assessment taken Id

Return type osid.id.Id

**Raise** IllegalState - has\_rubric() is false

compliance: mandatory – This method must be implemented.

## rubric

Gets the rubric.

**Returns** the assessment taken

Return type osid.assessment.AssessmentTaken

Raise <code>lllegalState-has\_rubric()</code> is false

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

### get\_assessment\_taken\_record (assessment\_taken\_record\_type)

Gets the assessment taken record corresponding to the given Assessment Taken record Type.

This is used to retrieve an object implementing method the requested record. The be Туре returned in assessment\_taken\_record\_type may the get\_record\_types() or any of its parents in a Type hierarchy where has\_record\_type(assessment\_taken\_record\_type) is true.

**Parameters assessment\_taken\_record\_type** (osid.type.Type) - an assessment taken record type

Returns the assessment taken record

Return type osid.assessment.records.AssessmentTakenRecord

Raise NullArgument - assessment\_taken\_record\_type is null

**Raise** OperationFailed – unable to complete request

**Raise** Unsupported - has\_record\_type(assessment\_taken\_record\_type) is false

compliance: mandatory – This method must be implemented.

### **Assessment Taken Form**

class dlkit.assessment.objects.AssessmentTakenForm Bases: dlkit.osid.objects.OsidObjectForm

This is the form for creating and updating an AssessmentTaken.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the AssessmentTakenAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

### taker\_metadata

Gets the metadata for a resource to manually set which resource will be taking the assessment.

Returns metadata for the resource

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

### taker

### get\_assessment\_taken\_form\_record(assessment\_taken\_record\_type)

Gets the AssessmentTakenFormRecord corresponding to the given assessment taken record Type.

**Parameters assessment\_taken\_record\_type** (osid.type.Type) - the assessment taken record type

Returns the assessment taken record

Return type osid.assessment.records.AssessmentTakenFormRecord

**Raise** NullArgument - assessment\_taken\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type(assessment\_taken\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Assessment Taken List**

class dlkit.assessment.objects.AssessmentTakenList
 Bases: dlkit.osid.objects.OsidList

Like all OsidLists, AssessmentTakenList provides a means for accessing AssessmentTaken elements sequentially either one at a time or many at a time.

Examples: while (atl.hasNext()) { AssessmentTaken assessment = atl.getNextAssessmentTaken();

or

while (atl.hasNext()) { AssessmentTaken[] assessments = atl.hetNextAssessmentsTaken(atl.available());

}

## next\_assessment\_taken

Gets the next Assessment Taken in this list.

**Returns** the next AssessmentTaken in this list. The has\_next() method should be used to test that a next AssessmentTaken is available before calling this method.

Return type osid.assessment.AssessmentTaken

**Raise** IllegalState – no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

### get\_next\_assessments\_taken(n)

Gets the next set of AssessmentTaken elements in this list which must be less than or equal to the number returned from available().

- **Parameters n** (cardinal) the number of AssessmentTaken elements requested which should be less than or equal to available()
- **Returns** an array of AssessmentTaken elements. The length of the array is less than or equal to the number specified.

Return type osid.assessment.AssessmentTaken

**Raise** IllegalState – no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

## **Assessment Section**

```
class dlkit.assessment.objects.AssessmentSection
Bases: dlkit.osid.objects.OsidObject
```

Represents an assessment section.

An assessment section represents a cluster of questions used to organize the execution of an assessment. The section is the student aspect of an assessment part.

## assessment\_taken\_id

Gets the Id of the AssessmentTaken.

Returns the assessment taken Id

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

### assessment\_taken

Gets the AssessmentTakeb.

**Returns** the assessment taken

Return type osid.assessment.AssessmentTaken

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

#### has\_allocated\_time()

Tests if this section must be completed within an allocated time.

Returns true if this section has an allocated time, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## allocated\_time

Gets the allocated time for this section.

**Returns** allocated time

Return type osid.calendaring.Duration

Raise IllegalState - has\_allocated\_time() is false

compliance: mandatory – This method must be implemented.

#### are\_items\_sequential()

Tests if the items or parts in this section are taken sequentially.

**Returns** true if the items are taken sequentially, false if the items can be skipped and revisited

Return type boolean

compliance: mandatory – This method must be implemented.

### are\_items\_shuffled()

Tests if the items or parts appear in a random order.

**Returns** true if the items appear in a random order, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### get\_assessment\_section\_record (assessment\_section\_record\_type)

Gets the assessment section record corresponding to the given AssessmentSection record Type.

This method is used to retrieve an object implementing the requested record. The assessment\_section\_record\_type may be the Type returned in or any of its hierarchy get\_record\_types() parents in a Type where has\_record\_type (assessment\_section\_record\_type) is true.

**Parameters assessment\_section\_record\_type** (osid.type.Type) - an assessment section record type

**Returns** the assessment section record

Return type osid.assessment.records.AssessmentSectionRecord

**Raise** NullArgument - assessment\_section\_record\_type is null

Raise OperationFailed - unable to complete request

Raise Unsupported-has\_record\_type(assessment\_section\_record\_type)
is false

compliance: mandatory – This method must be implemented.

## Assessment Section List

```
class dlkit.assessment.objects.AssessmentSectionList
    Bases: dlkit.osid.objects.OsidList
```

Like all OsidLists, AssessmentSectionList provides a means for accessing AssessmentSection elements sequentially either one at a time or many at a time.

Examples: while (asl.hasNext()) { AssessmentSection section = asl.getNextAssessmentSection();

or

while (asl.hasNext()) { AssessmentSection[] sections = asl.hetNextAssessmentSections(asl.available());

}

### next\_assessment\_section

Gets the next AssessmentSection in this list.

**Returns** the next AssessmentSection in this list. The has\_next() method should be used to test that a next AssessmentSection is available before calling this method.

Return type osid.assessment.AssessmentSection

Raise IllegalState - no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

## get\_next\_assessment\_sections(n)

Gets the next set of AssessmentSection elements in this list which must be less than or equal to the number returned from available().

- Parameters n (cardinal) the number of AssessmentSection elements requested
   which should be less than or equal to available()
- **Returns** an array of AssessmentSection elements. The length of the array is less than or equal to the number specified.

Return type osid.assessment.AssessmentSection

**Raise** IllegalState – no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

## Bank

class dlkit.assessment.objects.Bank (abc\_assessment\_objects.Bank, osid\_objects.OsidCatalog)
:noindex:

## get\_bank\_record (bank\_record\_type)

Gets the bank record corresponding to the given Bank record Type.

This method is used to retrieve an object implementing the requested record. The bank\_record\_type may be the Type returned in get\_record\_types () or any of its parents in a Type hierarchy where has\_record\_type (bank\_record\_type) is true.

Parameters bank\_record\_type (osid.type.Type) - a bank record type

**Returns** the bank record

Return type osid.assessment.records.BankRecord

Raise NullArgument - bank\_record\_type is null

**Raise** OperationFailed – unable to complete request

Raise Unsupported-has\_record\_type(bank\_record\_type) is false

compliance: mandatory – This method must be implemented.

# **Bank Form**

class dlkit.assessment.objects.BankForm
Bases: dlkit.osid.objects.OsidCatalogForm

This is the form for creating and updating banks.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the BankAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

## get\_bank\_form\_record(bank\_record\_type)

Gets the BankFormRecord corresponding to the given bank record Type.

Parameters bank\_record\_type (osid.type.Type) - a bank record type

Returns the bank record

Return type osid.assessment.records.BankFormRecord

**Raise** NullArgument - bank\_record\_type is null

**Raise** OperationFailed – unable to complete request

**Raise** Unsupported - has\_record\_type (bank\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Bank List**

```
class dlkit.assessment.objects.BankList
```

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, BankList provides a means for accessing Bank elements sequentially either one at a time or many at a time.

Examples: while (bl.hasNext()) { Bank bank = bl.getNextBank(); }

### or

```
while (bl.hasNext()) { Bank[] banks = bl.getNextBanks(bl.available());
```

}

## next\_bank

Gets the next Bank in this list.

**Returns** the next Bank in this list. The has\_next() method should be used to test that a next Bank is available before calling this method.

Return type osid.assessment.Bank

Raise IllegalState - no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

## $get_next_banks(n)$

Gets the next set of Bank elements in this list which must be less than or equal to the return from available().

- **Parameters n** (cardinal) the number of Bank elements requested which must be less than or equal to available ()
- **Returns** an array of Bank elements. The length of the array is less than or equal to the number specified.

Return type osid.assessment.Bank

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

# **Bank Node**

```
class dlkit.assessment.objects.BankNode
```

Bases: dlkit.osid.objects.OsidNode

This interface is a container for a partial hierarchy retrieval.

The number of hierarchy levels traversable through this interface depend on the number of levels requested in the BankHierarchySession.

## bank

Gets the Bank at this node.

Returns the bank represented by this node

Return type osid.assessment.Bank

compliance: mandatory – This method must be implemented.

# parent\_bank\_nodes

Gets the parents of this bank.

Returns the parents of this node

Return type osid.assessment.BankNodeList

compliance: mandatory – This method must be implemented.

## child\_bank\_nodes

Gets the children of this bank.

**Returns** the children of this node

Return type osid.assessment.BankNodeList

compliance: mandatory – This method must be implemented.

## **Bank Node List**

 $class \, \texttt{dlkit.assessment.objects.BankNodeList}$ 

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, BankNodeList provides a means for accessing BankNode elements sequentially either one at a time or many at a time.

Examples: while (bnl.hasNext()) { BankNode node = bnl.getNextBankNode(); }

### or

while (bnl.hasNext()) { BankNode[] nodes = bnl.getNextBankNodes(bnl.available());

}

### next\_bank\_node

Gets the next BankNode in this list.

**Returns** the next BankNode in this list. The has\_next() method should be used to test that a next BankNode is available before calling this method.

Return type osid.assessment.BankNode

Raise IllegalState - no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

### get\_next\_bank\_nodes (n)

Gets the next set of BankNode elements in this list which must be less than or equal to the return from available().

- **Parameters n** (cardinal) the number of BankNode elements requested which must be less than or equal to available()
- **Returns** an array of BanklNode elements. The length of the array is less than or equal to the number specified.

Return type osid.assessment.BankNode

**Raise** IllegalState – no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

## **Response List**

```
class dlkit.assessment.objects.ResponseList
    Bases: dlkit.osid.objects.OsidList
```

Like all OsidLists, ResponseList provides a means for accessing Response elements sequentially

either one at a time or many at a time.

Examples: while (rl.hasNext()) { Response response = rl.getNextResponse(); }

or

while (rl.hasNext()) { Response[] responses = rl.getNextResponses(rl.available());

}

### next\_response

Gets the next Response in this list.

**Returns** the next Response in this list. The has\_next() method should be used to test that a next Response is available before calling this method.

Return type osid.assessment.Response

**Raise** IllegalState – no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

## get\_next\_responses (n)

Gets the next set of Response elements in this list which must be less than or equal to the return from available().

- **Parameters n** (cardinal) the number of Response elements requested which must be less than or equal to available()
- **Returns** an array of Response elements. The length of the array is less than or equal to the number specified.

Return type osid.assessment.Response

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

# Queries

## **Question Query**

class dlkit.assessment.queries.QuestionQuery Bases: dlkit.osid.queries.OsidObjectQuery

This is the query for searching questions.

Each method match request produces an AND term while multiple invocations of a method produces a nested OR.

get\_question\_query\_record (question\_record\_type)

Gets the question record query corresponding to the given Item record Type.

Multiple retrievals produce a nested OR term.

Parameters question\_record\_type (osid.type.Type) - a question record type

**Returns** the question query record

Return type osid.assessment.records.QuestionQueryRecord

**Raise** NullArgument - question\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type (question\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Answer Query**

```
class dlkit.assessment.queries.AnswerQuery
```

Bases: dlkit.osid.queries.OsidObjectQuery

This is the query for searching answers.

Each method match request produces an AND term while multiple invocations of a method produces a nested OR.

```
get_answer_query_record (answer_record_type)
```

Gets the answer record query corresponding to the given Answer record Type.

Multiple retrievals produce a nested OR term.

Parameters answer\_record\_type (osid.type.Type) - an answer record type

Returns the answer query record

Return type osid.assessment.records.AnswerQueryRecord

**Raise** NullArgument - answer\_record\_type is null

**Raise** OperationFailed – unable to complete request

Raise Unsupported - has\_record\_type (answer\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Item Query**

```
class dlkit.assessment.queries.ItemQuery
```

```
dlkit.osid.queries.OsidObjectQuery, dlkit.osid.queries.
Bases:
OsidAggregateableQuery
```

This is the query for searching items.

Each method match request produces an AND term while multiple invocations of a method produces a nested OR.

## match\_learning\_objective\_id(objective\_id, match)

Sets the learning objective Id for this query.

### **Parameters**

- objective\_id (osid.id.Id) a learning objective Id
- match (boolean) true for a positive match, false for negative match

**Raise** NullArgument - objective id is null

compliance: mandatory – This method must be implemented.

learning\_objective\_id\_terms

```
supports_learning_objective_query()
```

Tests if an ObjectiveQuery is available.

**Returns** true if a learning objective query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### learning objective query

Gets the query for a learning objective.

Multiple retrievals produce a nested OR term.

Returns the learning objective query

**Return type** osid.learning.ObjectiveQuery

**Raise** Unimplemented - supports\_learning\_objective\_query() is false

compliance: optional – This method must be implemented if "supports\_learning\_objective\_query()" is "true".

### match\_any\_learning\_objective(match)

Matches an item with any objective.

**Parameters match** (boolean) - true to match items with any learning objective, false to match items with no learning objectives

compliance: mandatory – This method must be implemented.

## learning\_objective\_terms

match question id (question id, match) Sets the question Id for this query.

#### **Parameters**

- question id (osid.id.Id) a question Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - question\_id is null

compliance: mandatory – This method must be implemented.

## question\_id\_terms

### supports\_question\_query()

Tests if a QuestionQuery is available.

**Returns** true if a question query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## question\_query

Gets the query for a question.

Multiple retrievals produce a nested OR term.

Returns the question query

Return type osid.assessment.QuestionQuery

Raise Unimplemented - supports\_question\_query() is false

compliance: optional – This method must be implemented if ''supports\_learning\_objective\_query()'' is ''true''.

#### match\_any\_question(match)

Matches an item with any question.

**Parameters match** (boolean) - true to match items with any question, false to match items with no questions

compliance: mandatory – This method must be implemented.

## question\_terms

match\_answer\_id (answer\_id, match)
 Sets the answer Id for this query.

**Parameters** 

• answer\_id (osid.id.Id) - an answer Id

• match (boolean) - true for a positive match, false for a negative match

**Raise** NullArgument - answer\_id is null

compliance: mandatory – This method must be implemented.

## answer\_id\_terms

### supports\_answer\_query()

Tests if an AnswerQuery is available.

Returns true if an answer query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## answer\_query

Gets the query for an answer.

Multiple retrievals produce a nested OR term.

**Returns** the answer query

Return type osid.assessment.AnswerQuery

**Raise** Unimplemented – supports\_answer\_query() is false

compliance: optional – This method must be implemented if ''supports\_learning\_objective\_query()'' is ''true''.

### match\_any\_answer(match)

Matches an item with any answer.

**Parameters match** (boolean) – true to match items with any answer, false to match items with no answers

compliance: mandatory – This method must be implemented.

### answer\_terms

match\_assessment\_id(assessment\_id, match)

Sets the assessment Id for this query.

## **Parameters**

- assessment\_id (osid.id.Id) an assessment Id
- match (boolean) true for a positive match, false for negative match

**Raise** NullArgument - assessment\_id is null

compliance: mandatory – This method must be implemented.

### assessment\_id\_terms

## supports\_assessment\_query()

Tests if an AssessmentQuery is available.

Returns true if an assessment query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## assessment\_query

Gets the query for an assessment.

Multiple retrievals produce a nested OR term.

**Returns** the assessment query

Return type osid.assessment.AssessmentQuery

Raise Unimplemented - supports\_assessment\_query() is false

compliance: optional – This method must be implemented if "supports\_assessment\_query()" is "true".

### match\_any\_assessment (match)

Matches an item with any assessment.

**Parameters match** (boolean) - true to match items with any assessment, false to match items with no assessments

compliance: mandatory – This method must be implemented.

## assessment\_terms

match\_bank\_id (bank\_id, match)
 Sets the bank Id for this query.

**Parameters** 

• **bank\_id** (osid.id.Id) - a bank Id

• match (boolean) - true for a positive match, false for negative match

**Raise** NullArgument - bank\_id is null

compliance: mandatory – This method must be implemented.

## bank\_id\_terms

#### supports\_bank\_query()

Tests if a BankQuery is available.

**Returns** true if a bank query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### bank\_query

Gets the query for a bank.

Multiple retrievals produce a nested OR term.

**Returns** the bank query

Return type osid.assessment.BankQuery

Raise Unimplemented - supports\_bank\_query() is false

compliance: optional – This method must be implemented if ''supports\_bank\_query()'' is ''true''.

#### bank\_terms

## get\_item\_query\_record (item\_record\_type)

Gets the item record query corresponding to the given Item record Type.

Multiple retrievals produce a nested OR term.

**Parameters item\_record\_type** (osid.type.Type) - an item record type

Returns the item query record

Return type osid.assessment.records.ItemQueryRecord

**Raise** NullArgument - item\_record\_type is null

**Raise** OperationFailed – unable to complete request

**Raise** Unsupported - has\_record\_type (item\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Assessment Query**

class dlkit.assessment.queries.AssessmentQuery

 $Bases: \ \texttt{dlkit.osid.queries.OsidObjectQuery}$ 

This is the query for searching assessments.

Each method match request produces an AND term while multiple invocations of a method produces a nested OR.

match\_level\_id (grade\_id, match)
 Sets the level grade Id for this query.

**Parameters** 

• grade\_id (osid.id.Id) - a grade Id

• match (boolean) - true for a positive match, false for a negative match

**Raise** NullArgument - grade\_id is null

compliance: mandatory – This method must be implemented.

## level\_id\_terms

## supports\_level\_query()

Tests if a GradeQuery is available.

**Returns** true if a grade query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## level\_query

Gets the query for a grade.

Multiple retrievals produce a nested OR term.

Returns the grade query

Return type osid.grading.GradeQuery

Raise Unimplemented - supports\_level\_query() is false

compliance: optional – This method must be implemented if ''supports\_level\_query()'' is ''true''.

## match\_any\_level (match)

Matches an assessment that has any level assigned.

**Parameters match** (boolean) - true to match assessments with any level, false to match assessments with no level

compliance: mandatory - This method must be implemented.

## level\_terms

## match\_rubric\_id(assessment\_id, match)

Sets the rubric assessment Id for this query.

## **Parameters**

- assessment\_id (osid.id.Id) an assessment Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - assessment\_id is null

compliance: mandatory – This method must be implemented.

## rubric\_id\_terms

## supports\_rubric\_query()

Tests if an AssessmentQuery is available.

Returns true if a rubric assessment query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## rubric\_query

Gets the query for a rubric assessment.

Multiple retrievals produce a nested OR term.

Returns the assessment query

Return type osid.assessment.AssessmentQuery

**Raise** Unimplemented - supports\_rubric\_query() is false

compliance: optional – This method must be implemented if ''supports\_rubric\_query()'' is ''true''.

## match\_any\_rubric (match)

Matches an assessment that has any rubric assessment assigned.

**Parameters match** (boolean) – true to match assessments with any rubric, false to match assessments with no rubric

compliance: mandatory – This method must be implemented.

## rubric\_terms

match\_item\_id (item\_id, match)
 Sets the item Id for this query.

#### **Parameters**

- item\_id (osid.id.Id) an item Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - item\_id is null

compliance: mandatory – This method must be implemented.

### item\_id\_terms

#### supports\_item\_query()

Tests if an ItemQuery is available.

**Returns** true if an item query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### item\_query

Gets the query for an item.

Multiple retrievals produce a nested OR term.

Returns the item query

Return type osid.assessment.ItemQuery

Raise Unimplemented - supports\_item\_query() is false

compliance: optional – This method must be implemented if "supports\_item\_query()" is "true".

### match\_any\_item (match)

Matches an assessment that has any item.

**Parameters match** (boolean) – true to match assessments with any item, false to match assessments with no items

compliance: mandatory – This method must be implemented.

#### item\_terms

### match\_assessment\_offered\_id (assessment\_offered\_id, match)

Sets the assessment offered Id for this query.

### Parameters

- assessment\_offered\_id (osid.id.Id) an assessment offered Id
- match (boolean) true for a positive match, false for a negative match
- **Raise** NullArgument assessment\_offered\_id is null

compliance: mandatory – This method must be implemented.

## assessment\_offered\_id\_terms

### supports\_assessment\_offered\_query()

Tests if an AssessmentOfferedQuery is available.

Returns true if an assessment offered query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### assessment\_offered\_query

Gets the query for an assessment offered.

Multiple retrievals produce a nested OR term.

**Returns** the assessment offered query

Return type osid.assessment.AssessmentOfferedQuery

Raise Unimplemented - supports\_assessment\_offered\_query() is false

compliance: optional – This method must be implemented if 'supports\_assessment\_offered\_query()'' is ''true''.

### match\_any\_assessment\_offered(match)

Matches an assessment that has any offering.

**Parameters match** (boolean) – true to match assessments with any offering, false to match assessments with no offerings

compliance: mandatory – This method must be implemented.

#### assessment\_offered\_terms

match\_assessment\_taken\_id(assessment\_taken\_id, match)

Sets the assessment taken Id for this query.

### **Parameters**

- assessment\_taken\_id (osid.id.Id) an assessment taken Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - assessment\_taken\_id is null

compliance: mandatory – This method must be implemented.

#### assessment\_taken\_id\_terms

### supports\_assessment\_taken\_query()

Tests if an AssessmentTakenQuery is available.

**Returns** true if an assessment taken query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### assessment\_taken\_query

Gets the query for an assessment taken.

Multiple retrievals produce a nested OR term.

**Returns** the assessment taken query

Return type osid.assessment.AssessmentTakenQuery

Raise Unimplemented - supports\_assessment\_taken\_query() is false

compliance: optional – This method must be implemented if ''supports\_assessment\_taken\_query()'' is ''true''.

#### match\_any\_assessment\_taken (match)

Matches an assessment that has any taken version.

**Parameters match** (boolean) – true to match assessments with any taken assessments, false to match assessments with no taken assessments

compliance: mandatory - This method must be implemented.

#### assessment\_taken\_terms

match\_bank\_id (bank\_id, match)
 Sets the bank Id for this query.

#### **Parameters**

• bank\_id (osid.id.Id) - a bank Id

• match (boolean) - true for a positive match, false for a negative match

**Raise** NullArgument - bank\_id is null

compliance: mandatory – This method must be implemented.

### bank\_id\_terms

#### supports\_bank\_query()

Tests if a BankQuery is available.

**Returns** true if a bank query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### bank\_query

Gets the query for a bank.

Multiple retrievals produce a nested OR term.

Returns the bank query

Return type osid.assessment.BankQuery

Raise Unimplemented - supports\_bank\_query() is false

compliance: optional – This method must be implemented if "supports\_bank\_query()" is "true".

### bank\_terms

## get\_assessment\_query\_record (assessment\_record\_type)

Gets the assessment query record corresponding to the given Assessment record Type.

Multiple retrievals produce a nested OR term.

Parameters assessment\_record\_type (osid.type.Type) - an assessment record
type

Returns the assessment query record

Return type osid.assessment.records.AssessmentQueryRecord

**Raise** NullArgument - assessment\_record\_type is null

**Raise** OperationFailed – unable to complete request

Raise Unsupported - has\_record\_type (assessment\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Assessment Offered Query**

```
class dlkit.assessment.queries.AssessmentOfferedQuery
```

Bases: dlkit.osid.queries.OsidObjectQuery, OsidSubjugateableQuery dlkit.osid.queries.

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This is the query for searching assessments.

Each method match request produces an AND term while multiple invocations of a method produces a nested OR.

match\_assessment\_id(assessment\_id, match)

Sets the assessment Id for this query.

#### **Parameters**

- assessment\_id (osid.id.Id) an assessment Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - assessment\_id is null

compliance: mandatory – This method must be implemented.

## assessment\_id\_terms

```
supports_assessment_query()
```

Tests if an AssessmentQuery is available.

**Returns** true if an assessment query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### assessment\_query

Gets the query for an assessment.

Multiple retrievals produce a nested OR term.

**Returns** the assessment query

Return type osid.assessment.AssessmentQuery

Raise Unimplemented - supports\_assessment\_query() is false

compliance: optional – This method must be implemented if "supports\_assessment\_query()" is "true".

#### assessment\_terms

match\_level\_id (grade\_id, match)
 Sets the level grade Id for this query.

## **Parameters**

- grade\_id (osid.id.Id) a grade Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - grade\_id is null

compliance: mandatory – This method must be implemented.

## level\_id\_terms

## supports\_level\_query()

Tests if a GradeQuery is available.

**Returns** true if a grade query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### level\_query

Gets the query for a grade.

Multiple retrievals produce a nested OR term.

Returns the grade query

Return type osid.grading.GradeQuery

Raise Unimplemented - supports\_level\_query() is false

compliance: optional – This method must be implemented if "supports\_level\_query()" is "true".

## match\_any\_level (match)

Matches an assessment offered that has any level assigned.

**Parameters match** (boolean) – true to match offerings with any level, false to match offerings with no levsls

compliance: mandatory – This method must be implemented.

## level\_terms

### match\_items\_sequential(match)

Match sequential assessments.

Parameters match (boolean) - true for a positive match, false for a negative match

compliance: mandatory – This method must be implemented.

#### items\_sequential\_terms

# match\_items\_shuffled(match)

Match shuffled item assessments.

Parameters match (boolean) - true for a positive match, false for a negative match

compliance: mandatory – This method must be implemented.

## items\_shuffled\_terms

#### match\_start\_time (start, end, match)

Matches assessments whose start time falls between the specified range inclusive.

### **Parameters**

• **start** (osid.calendaring.DateTime) - start of range

- end (osid.calendaring.DateTime) end of range
- match (boolean) true for a positive match, false for a negative match

Raise InvalidArgument - end is less than start

compliance: mandatory – This method must be implemented.

## match\_any\_start\_time (match)

Matches offerings that has any start time assigned.

**Parameters match** (boolean) - true to match offerings with any start time, false to match offerings with no start time

compliance: mandatory – This method must be implemented.

#### start\_time\_terms

### match\_deadline (start, end, match)

Matches assessments whose end time falls between the specified range inclusive.

#### **Parameters**

- **start** (osid.calendaring.DateTime) **start** of range
- end (osid.calendaring.DateTime) end of range
- match (boolean) true for a positive match, false for a negative match

Raise InvalidArgument - end is less than start

**Raise** NullArgument - start or end is null

compliance: mandatory – This method must be implemented.

## match\_any\_deadline (match)

Matches offerings that have any deadline assigned.

**Parameters match** (boolean) - true to match offerings with any deadline, false to match offerings with no deadline

compliance: mandatory – This method must be implemented.

### deadline\_terms

### match\_duration (low, high, match)

Matches assessments whose duration falls between the specified range inclusive.

## Parameters

- **low** (osid.calendaring.Duration) start range of duration
- high (osid.calendaring.Duration) end range of duration
- match (boolean) true for a positive match, false for a negative match

Raise InvalidArgument - end is less than start

Raise NullArgument - start or end is null

compliance: mandatory – This method must be implemented.

### match\_any\_duration (match)

Matches offerings that have any duration assigned.

**Parameters match** (boolean) - true to match offerings with any duration, false to match offerings with no duration

#### compliance: mandatory – This method must be implemented.

### duration\_terms

match\_score\_system\_id (grade\_system\_id, match)

Sets the grade system Id for this query.

## Parameters

- grade\_system\_id (osid.id.Id) a grade system Id
- **match** (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - grade\_system\_id is null

compliance: mandatory – This method must be implemented.

### score\_system\_id\_terms

## supports\_score\_system\_query()

Tests if a GradeSystemQuery is available.

**Returns** true if a grade system query is available, false otherwise

**Return type** boolean

compliance: mandatory – This method must be implemented.

## score\_system\_query

Gets the query for a grade system.

Multiple retrievals produce a nested OR term.

Returns the grade system query

Return type osid.grading.GradeSystemQuery

Raise Unimplemented - supports\_score\_system\_query() is false

compliance: optional – This method must be implemented if ''supports\_score\_system\_query()'' is ''true''.

## match\_any\_score\_system(match)

Matches taken assessments that have any grade system assigned.

**Parameters match** (boolean) – true to match assessments with any grade system, false to match assessments with no grade system

compliance: mandatory – This method must be implemented.

### score\_system\_terms

match\_grade\_system\_id (grade\_system\_id, match)
Sets the grade system Id for this query.

#### Parameters

- grade\_system\_id (osid.id.Id) a grade system Id
- **match** (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - grade\_system\_id is null

compliance: mandatory – This method must be implemented.

### grade\_system\_id\_terms

```
supports_grade_system_query()
```

Tests if a GradeSystemQuery is available.

**Returns** true if a grade system query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## grade\_system\_query

Gets the query for a grade system.

Multiple retrievals produce a nested OR term.

**Returns** the grade system query

Return type osid.grading.GradeSystemQuery

**Raise** Unimplemented - supports\_score\_system\_query() is false

compliance: optional – This method must be implemented if ''supports\_score\_system\_query()'' is ''true''.

### match\_any\_grade\_system(match)

Matches taken assessments that have any grade system assigned.

**Parameters match** (boolean) – true to match assessments with any grade system, false to match assessments with no grade system

compliance: mandatory – This method must be implemented.

## $grade\_system\_terms$

match\_rubric\_id (assessment\_offered\_id, match)
Sets the rubric assessment offered Id for this query.

### **Parameters**

- assessment\_offered\_id (osid.id.Id) an assessment offered Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - assessment\_offered\_id is null

*compliance: mandatory – This method must be implemented.* 

# rubric\_id\_terms

## supports\_rubric\_query()

Tests if an AssessmentOfferedQuery is available.

**Returns** true if a rubric assessment offered query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## rubric\_query

Gets the query for a rubric assessment.

Multiple retrievals produce a nested OR term.

**Returns** the assessment offered query

**Return type** osid.assessment.AssessmentOfferedQuery

Raise Unimplemented - supports\_rubric\_query() is false

compliance: optional – This method must be implemented if "supports\_rubric\_query()" is "true".

#### match\_any\_rubric(match)

Matches an assessment offered that has any rubric assessment assigned.

**Parameters match** (boolean) – true to match assessments offered with any rubric, false to match assessments offered with no rubric

compliance: mandatory – This method must be implemented.

## rubric\_terms

match\_assessment\_taken\_id (assessment\_taken\_id, match)
Sets the assessment taken Id for this query.

**Parameters** 

• assessment\_taken\_id (osid.id.Id) - an assessment taken Id

• match (boolean) - true for a positive match, false for a negative match

**Raise** NullArgument - assessment\_taken\_id is null

compliance: mandatory – This method must be implemented.

## assessment\_taken\_id\_terms

#### supports\_assessment\_taken\_query()

Tests if an AssessmentTakenQuery is available.

Returns true if an assessment taken query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### assessment\_taken\_query

Gets the query for an assessment taken.

Multiple retrievals produce a nested OR term.

**Returns** the assessment taken query

Return type osid.assessment.AssessmentTakenQuery

Raise Unimplemented - supports\_assessment\_taken\_query() is false

compliance: optional – This method must be implemented if ''supports\_assessment\_taken\_query()'' is ''true''.

#### match\_any\_assessment\_taken (match)

Matches offerings that have any taken assessment version.

**Parameters match** (boolean) – true to match offerings with any taken assessment, false to match offerings with no assessmen taken

compliance: mandatory – This method must be implemented.

assessment\_taken\_terms

match\_bank\_id (bank\_id, match)
 Sets the bank Id for this query.

**Parameters** 

- bank\_id (osid.id.Id) a bank Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - bank\_id is null

compliance: mandatory – This method must be implemented.

bank\_id\_terms

## supports\_bank\_query()

Tests if a BankQuery is available.

**Returns** true if a bank query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## bank\_query

Gets the query for a bank.

Multiple retrievals produce a nested OR term.

**Returns** the bank query

Return type osid.assessment.BankQuery

Raise Unimplemented - supports\_bank\_query() is false

compliance: optional – This method must be implemented if ''supports\_bank\_query()'' is ''true''.

### bank\_terms

### get\_assessment\_offered\_query\_record (assessment\_offered\_record\_type)

Gets the assessment offered query record corresponding to the given AssessmentOffered record Type.

Multiple retrievals produce a nested OR term.

**Parameters assessment\_offered\_record\_type** (osid.type.Type) - an assessment offered record type

Returns the assessment offered query record

Return type osid.assessment.records.AssessmentOfferedQueryRecord

**Raise** NullArgument - assessment\_offered\_record\_type is null

**Raise** OperationFailed – unable to complete request

Raise Unsupported-has\_record\_type(assessment\_offered\_record\_type)
is false

compliance: mandatory – This method must be implemented.

## **Assessment Taken Query**

class dlkit.assessment.queries.AssessmentTakenQuery Bases: dlkit.osid.queries.OsidObjectQuery

This is the query for searching assessments.

Each method match request produces an AND term while multiple invocations of a method produces a nested OR.

match\_assessment\_offered\_id (assessment\_offered\_id, match)

Sets the assessment offered Id for this query.

Parameters

• assessment\_offered\_id (osid.id.Id) - an assessment Id

• match (boolean) - true for a positive match, false for a negative match

**Raise** NullArgument - assessment\_offered\_id is null

compliance: mandatory – This method must be implemented.

### assessment\_offered\_id\_terms

### supports\_assessment\_offered\_query()

Tests if an AssessmentOfferedQuery is available.

Returns true if an assessment offered query is available, false otherwise

**Return type** boolean

compliance: mandatory – This method must be implemented.

## assessment\_offered\_query

Gets the query for an assessment.

Multiple retrievals produce a nested OR term.

Returns the assessment offered query

Return type osid.assessment.AssessmentOfferedQuery

Raise Unimplemented - supports\_assessment\_offered\_query() is false

compliance: optional – This method must be implemented if ''supports\_assessment\_offered\_query()'' is ''true''.

## assessment\_offered\_terms

match\_taker\_id(resource\_id, match)

Sets the resource Id for this query.

## Parameters

- resource\_id (osid.id.Id) a resource Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - resource\_id is null

compliance: mandatory – This method must be implemented.

## taker\_id\_terms

## supports\_taker\_query()

Tests if a ResourceQuery is available.

Returns true if a resource query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### taker\_query

Gets the query for a resource.

Multiple retrievals produce a nested OR term.

Returns the resource query

Return type osid.resource.ResourceQuery

Raise Unimplemented - supports\_taker\_query() is false

compliance: optional – This method must be implemented if "supports\_taker\_query()" is "true".

#### taker\_terms

match\_taking\_agent\_id (agent\_id, match)
Sets the agent Id for this query.

#### **Parameters**

- agent\_id (osid.id.Id) an agent Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - agent\_id is null

compliance: mandatory – This method must be implemented.

## taking\_agent\_id\_terms

### supports\_taking\_agent\_query()

Tests if an AgentQuery is available.

Returns true if an agent query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### taking\_agent\_query

Gets the query for an agent.

Multiple retrievals produce a nested OR term.

**Returns** the agent query

**Return type** osid.authentication.AgentQuery

**Raise** Unimplemented - supports\_taking\_agent\_query() is false

compliance: optional – This method must be implemented if "supports\_taking\_agent\_query()" is "true".

### taking\_agent\_terms

#### match\_actual\_start\_time (start, end, match)

Matches assessments whose start time falls between the specified range inclusive.

## **Parameters**

- start (osid.calendaring.DateTime) start of range
- end (osid.calendaring.DateTime) end of range
- match (boolean) true for a positive match, false for a negative match

Raise InvalidArgument - end is less than start

Raise NullArgument - start or end is null

*compliance: mandatory – This method must be implemented.* 

### match\_any\_actual\_start\_time (match)

Matches taken assessments taken that have begun.

**Parameters match** (boolean) – true to match assessments taken started, false to match assessments taken that have not begun

compliance: mandatory – This method must be implemented.

## actual\_start\_time\_terms

#### match\_completion\_time (start, end, match)

Matches assessments whose completion time falls between the specified range inclusive.

## **Parameters**

- start (osid.calendaring.DateTime) start of range
- end (osid.calendaring.DateTime) end of range
- match (boolean) true for a positive match, false for a negative match

Raise InvalidArgument - end is less than start

**Raise** NullArgument – start or end is null

compliance: mandatory – This method must be implemented.

#### match\_any\_completion\_time (match)

Matches taken assessments taken that have completed.

**Parameters match** (boolean) – true to match assessments taken completed, false to match assessments taken that are incomplete

compliance: mandatory – This method must be implemented.

### completion\_time\_terms

#### match\_time\_spent (low, high, match)

Matches assessments where the time spent falls between the specified range inclusive.

## Parameters

- low (osid.calendaring.Duration) start of duration range
- high (osid.calendaring.Duration) end of duration range
- match (boolean) true for a positive match, false for a negative match

Raise InvalidArgument - high is less than low

**Raise** NullArgument - low or high is null

compliance: mandatory – This method must be implemented.

#### time\_spent\_terms

```
match_score_system_id(grade_system_id, match)
```

Sets the grade system Id for this query.

#### Parameters

- grade\_system\_id (osid.id.Id) a grade system Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - grade\_system\_id is null

compliance: mandatory – This method must be implemented.

## score\_system\_id\_terms

## supports\_score\_system\_query()

Tests if a GradeSystemQuery is available.

**Returns** true if a grade system query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## score\_system\_query

Gets the query for a grade system.

Multiple retrievals produce a nested OR term.

Returns the grade system query

Return type osid.grading.GradeSystemQuery

Raise Unimplemented - supports\_score\_system\_query() is false

compliance: optional – This method must be implemented if ''supports\_score\_system\_query()'' is ''true''.

# match\_any\_score\_system(match)

Matches taken assessments that have any grade system assigned.

**Parameters match** (boolean) – true to match assessments with any grade system, false to match assessments with no grade system

compliance: mandatory – This method must be implemented.

## score\_system\_terms

match\_score (low, high, match)

Matches assessments whose score falls between the specified range inclusive.

### **Parameters**

- **low** (decimal) start of range
- high (decimal) end of range
- match (boolean) true for a positive match, false for negative match

**Raise** InvalidArgument - high is less than low

compliance: mandatory – This method must be implemented.

### match\_any\_score (match)

Matches taken assessments that have any score assigned.

**Parameters match** (boolean) - true to match assessments with any score, false to match assessments with no score

compliance: mandatory – This method must be implemented.

## score\_terms

match\_grade\_id (grade\_id, match)

Sets the grade Id for this query.

## Parameters

- grade\_id (osid.id.Id) a grade Id
- **match** (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - grade\_id is null

compliance: mandatory – This method must be implemented.

# grade\_id\_terms

supports\_grade\_query()

Tests if a GradeQuery is available.

Returns true if a grade query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## grade\_query

Gets the query for a grade.

Multiple retrievals produce a nested OR term.

**Returns** the grade query

Return type osid.grading.GradeQuery

Raise Unimplemented - supports\_grade\_query() is false

compliance: optional – This method must be implemented if "supports\_grade\_query()" is "true".

#### match\_any\_grade (match)

Matches taken assessments that have any grade assigned.

**Parameters match** (boolean) - true to match assessments with any grade, false to match assessments with no grade

compliance: mandatory – This method must be implemented.

## grade\_terms

match\_feedback (comments, string\_match\_type, match)

Sets the comment string for this query.

### **Parameters**

- comments (string) comment string
- string\_match\_type (osid.type.Type) the string match type
- match (boolean) true for a positive match, false for negative match

**Raise** InvalidArgument - comments is not of string\_match\_type

**Raise** NullArgument - comments or string\_match\_type is null

Raise Unsupported - supports\_string\_match\_type(string\_match\_type) is
false

compliance: mandatory – This method must be implemented.

#### match\_any\_feedback (match)

Matches taken assessments that have any comments.

**Parameters match** (boolean) – true to match assessments with any comments, false to match assessments with no comments

compliance: mandatory – This method must be implemented.

### feedback\_terms

match\_rubric\_id (assessment\_taken\_id, match)
Sets the rubric assessment taken Id for this query.

#### **Parameters**

- assessment\_taken\_id (osid.id.Id) an assessment taken Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - assessment\_taken\_id is null

*compliance: mandatory – This method must be implemented.* 

rubric\_id\_terms

#### supports\_rubric\_query()

Tests if an AssessmentTakenQuery is available.

Returns true if a rubric assessment taken query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## rubric\_query

Gets the query for a rubric assessment.

Multiple retrievals produce a nested OR term.

**Returns** the assessment taken query

Return type osid.assessment.AssessmentTakenQuery

Raise Unimplemented - supports\_rubric\_query() is false

compliance: optional – This method must be implemented if "supports\_rubric\_query()" is "true".

#### match\_any\_rubric(match)

Matches an assessment taken that has any rubric assessment assigned.

**Parameters match** (boolean) – true to match assessments taken with any rubric, false to match assessments taken with no rubric

compliance: mandatory – This method must be implemented.

## rubric\_terms

match\_bank\_id (bank\_id, match)
 Sets the bank Id for this query.

## **Parameters**

- bank\_id (osid.id.Id) a bank Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - bank\_id is null

compliance: mandatory – This method must be implemented.

## bank\_id\_terms

## supports\_bank\_query()

Tests if a BankQuery is available.

**Returns** true if a bank query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## bank\_query

Gets the query for a bank.

Multiple retrievals produce a nested OR term.

**Returns** the bank query

Return type osid.assessment.BankQuery

Raise Unimplemented - supports\_bank\_query() is false

compliance: optional – This method must be implemented if "supports\_bank\_query()" is "true".

- bank\_terms
- get\_assessment\_taken\_query\_record (assessment\_taken\_record\_type)

Gets the assessment taken query record corresponding to the given AssessmentTaken record Type. Multiple retrievals produce a nested OR term.

**Parameters assessment\_taken\_record\_type** (osid.type.Type) - an assessment taken record type

**Returns** the assessment taken query record

Return type osid.assessment.records.AssessmentTakenQueryRecord

**Raise** NullArgument - assessment\_taken\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type(assessment\_taken\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Bank Query**

```
class dlkit.assessment.queries.BankQuery
```

Bases: dlkit.osid.queries.OsidCatalogQuery

This is the query for searching banks Each method specifies an AND term while multiple invocations of the same method produce a nested OR.

match\_item\_id (item\_id, match)
 Sets the item Id for this query.

## Parameters

- item\_id (osid.id.Id) an item Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - item\_id is null

compliance: mandatory – This method must be implemented.

### item\_id\_terms

### supports\_item\_query()

Tests if a ItemQuery is available.

**Returns** true if an item query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## item\_query

Gets the query for an item.

Multiple retrievals produce a nested OR term.

**Returns** the item query

Return type osid.assessment.ItemQuery

Raise Unimplemented - supports\_item\_query() is false

compliance: optional – This method must be implemented if "supports\_item\_query()" is "true".

#### match\_any\_item (match)

Matches assessment banks that have any item assigned.

**Parameters match** (boolean) - true to match banks with any item, false to match assessments with no item

compliance: mandatory – This method must be implemented.

## item\_terms

match\_assessment\_id (assessment\_id, match)
Sets the assessment Id for this query.

### **Parameters**

• assessment\_id (osid.id.Id) - an assessment Id

• match (boolean) - true for a positive match, false for a negative match

**Raise** NullArgument - assessment\_id is null

compliance: mandatory – This method must be implemented.

## assessment\_id\_terms

### supports\_assessment\_query()

Tests if an AssessmentQuery is available.

**Returns** true if an assessment query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## assessment\_query

Gets the query for an assessment.

Multiple retrievals produce a nested OR term.

Returns the assessment query

**Return type** osid.assessment.AssessmentQuery

**Raise** Unimplemented - supports\_assessment\_query() is false

compliance: optional – This method must be implemented if "supports\_assessment\_query()" is "true".

## match\_any\_assessment (match)

Matches assessment banks that have any assessment assigned.

**Parameters match** (boolean) - true to match banks with any assessment, false to match banks with no assessment

compliance: mandatory – This method must be implemented.

## assessment\_terms

match\_assessment\_offered\_id (assessment\_offered\_id, match)

Sets the assessment offered Id for this query.

## Parameters

- assessment\_offered\_id (osid.id.Id) an assessment Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - assessment\_offered\_id is null

compliance: mandatory – This method must be implemented.

### assessment\_offered\_id\_terms

### supports\_assessment\_offered\_query()

Tests if an AssessmentOfferedQuery is available.

Returns true if an assessment offered query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## assessment\_offered\_query

Gets the query for an assessment offered.

Multiple retrievals produce a nested OR term.

Returns the assessment offered query

Return type osid.assessment.AssessmentOfferedQuery

**Raise** Unimplemented - supports\_assessment\_offered\_query() is false

compliance: optional – This method must be implemented if ''supports\_assessment\_offered\_query()'' is ''true''.

## match\_any\_assessment\_offered(match)

Matches assessment banks that have any assessment offering assigned.

**Parameters match** (boolean) - true to match banks with any assessment offering, false to match banks with no offering

compliance: mandatory – This method must be implemented.

### assessment\_offered\_terms

#### match\_ancestor\_bank\_id(bank\_id, match)

Sets the bank Id for to match banks in which the specified bank is an acestor.

## Parameters

- **bank\_id** (osid.id.Id) a bank Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - bank\_id is null

compliance: mandatory – This method must be implemented.

### ancestor\_bank\_id\_terms

### supports\_ancestor\_bank\_query()

Tests if a BankQuery is available.

**Returns** true if a bank query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### ancestor\_bank\_query

Gets the query for an ancestor bank.

Multiple retrievals produce a nested OR term.

Returns the bank query

Return type osid.assessment.BankQuery

**Raise** Unimplemented - supports\_ancestor\_bank\_query() is false

compliance: optional – This method must be implemented if ''supports\_ancestor\_bank\_query()'' is ''true''.

## match\_any\_ancestor\_bank (match)

Matches a bank that has any ancestor.

**Parameters match** (boolean) - true to match banks with any ancestor banks, false to match root banks

compliance: mandatory – This method must be implemented.

## ancestor\_bank\_terms

### match\_descendant\_bank\_id(bank\_id, match)

Sets the bank Id for to match banks in which the specified bank is a descendant.

#### **Parameters**

- bank\_id (osid.id.Id) a bank Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - bank\_id is null

compliance: mandatory – This method must be implemented.

## descendant\_bank\_id\_terms

## supports\_descendant\_bank\_query()

Tests if a BankQuery is available.

**Returns** true if a bank query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## descendant\_bank\_query

Gets the query for a descendant bank.

Multiple retrievals produce a nested OR term.

**Returns** the bank query

Return type osid.assessment.BankQuery

Raise Unimplemented - supports\_descendant\_bank\_query() is false

compliance: optional – This method must be implemented if ''supports\_descendant\_bank\_query()'' is ''true''.

#### match\_any\_descendant\_bank (match)

Matches a bank that has any descendant.

**Parameters match** (boolean) - true to match banks with any descendant banks, false to match leaf banks

compliance: mandatory – This method must be implemented.

#### descendant\_bank\_terms

```
get_bank_query_record (bank_record_type)
```

Gets the bank query record corresponding to the given Bank record Type.

Multiple record retrievals produce a nested OR term.

Parameters bank\_record\_type (osid.type.Type) - a bank record type
Returns the bank query record
Return type osid.assessment.records.BankQueryRecord
Raise NullArgument - bank\_record\_type is null
Raise OperationFailed - unable to complete request
Raise Unsupported - has\_record\_type (bank\_record\_type) is false
compliance: mandatory - This method must be implemented.

# Records

## **Question Record**

class dlkit.assessment.records.QuestionRecord Bases: dlkit.osid.records.OsidRecord

A record for a Question.

The methods specified by the record type are available through the underlying object.

## **Question Query Record**

class dlkit.assessment.records.QuestionQueryRecord Bases: dlkit.osid.records.OsidRecord

A record for a QuestionQuery.

The methods specified by the record type are available through the underlying object.

# **Question Form Record**

class dlkit.assessment.records.QuestionFormRecord Bases: dlkit.osid.records.OsidRecord

A record for a QuestionForm.

The methods specified by the record type are available through the underlying object.

# **Answer Record**

class dlkit.assessment.records.AnswerRecord Bases: dlkit.osid.records.OsidRecord

A record for an Answer.

## **Answer Query Record**

class dlkit.assessment.records.AnswerQueryRecord Bases: dlkit.osid.records.OsidRecord

A record for an AnswerQuery.

The methods specified by the record type are available through the underlying object.

# **Answer Form Record**

class dlkit.assessment.records.AnswerFormRecord Bases: dlkit.osid.records.OsidRecord

A record for an AnswerForm.

The methods specified by the record type are available through the underlying object.

# **Item Record**

class dlkit.assessment.records.ItemRecord Bases: dlkit.osid.records.OsidRecord

A record for an Item.

The methods specified by the record type are available through the underlying object.

# **Item Query Record**

class dlkit.assessment.records.ItemQueryRecord Bases: dlkit.osid.records.OsidRecord

A record for an ItemQuery.

The methods specified by the record type are available through the underlying object.

# **Item Form Record**

class dlkit.assessment.records.ItemFormRecord
 Bases: dlkit.osid.records.OsidRecord

A record for an ItemForm.

The methods specified by the record type are available through the underlying object.

# **Item Search Record**

class dlkit.assessment.records.ItemSearchRecord Bases: dlkit.osid.records.OsidRecord

A record for an ItemSearch.

# **Assessment Record**

class dlkit.assessment.records.AssessmentRecord Bases: dlkit.osid.records.OsidRecord

A record for an Assessment.

The methods specified by the record type are available through the underlying object.

## **Assessment Query Record**

class dlkit.assessment.records.AssessmentQueryRecord Bases: dlkit.osid.records.OsidRecord

A record for an AssessmentQuery.

The methods specified by the record type are available through the underlying object.

# **Assessment Form Record**

class dlkit.assessment.records.AssessmentFormRecord Bases: dlkit.osid.records.OsidRecord

A record for an AssessmentForm.

The methods specified by the record type are available through the underlying object.

# **Assessment Search Record**

class dlkit.assessment.records.AssessmentSearchRecord Bases: dlkit.osid.records.OsidRecord

A record for an AssessmentSearch.

The methods specified by the record type are available through the underlying object.

# **Assessment Offered Record**

class dlkit.assessment.records.AssessmentOfferedRecord Bases: dlkit.osid.records.OsidRecord

A record for an AssessmentOffered.

The methods specified by the record type are available through the underlying object.

## **Assessment Offered Query Record**

class dlkit.assessment.records.AssessmentOfferedQueryRecord Bases: dlkit.osid.records.OsidRecord

A record for an AssessmentOfferedQuery.

## **Assessment Offered Form Record**

class dlkit.assessment.records.AssessmentOfferedFormRecord Bases: dlkit.osid.records.OsidRecord

A record for an AssessmentOfferedForm.

The methods specified by the record type are available through the underlying object.

# **Assessment Offered Search Record**

class dlkit.assessment.records.AssessmentOfferedSearchRecord Bases: dlkit.osid.records.OsidRecord

A record for an AssessmentOfferedSearch.

The methods specified by the record type are available through the underlying object.

# **Assessment Taken Record**

class dlkit.assessment.records.AssessmentTakenRecord Bases: dlkit.osid.records.OsidRecord

A record for an AssessmentTaken.

The methods specified by the record type are available through the underlying object.

## **Assessment Taken Query Record**

class dlkit.assessment.records.AssessmentTakenQueryRecord Bases: dlkit.osid.records.OsidRecord

A record for an AssessmentTakenQuery.

The methods specified by the record type are available through the underlying object.

# Assessment Taken Form Record

class dlkit.assessment.records.AssessmentTakenFormRecord Bases: dlkit.osid.records.OsidRecord

A record for an AssessmentTakenForm.

The methods specified by the record type are available through the underlying object.

# **Assessment Taken Search Record**

class dlkit.assessment.records.AssessmentTakenSearchRecord Bases: dlkit.osid.records.OsidRecord

A record for an AssessmentTakenSearch.

### **Assessment Section Record**

class dlkit.assessment.records.AssessmentSectionRecord Bases: dlkit.osid.records.OsidRecord

A record for an AssessmentSection.

The methods specified by the record type are available through the underlying object.

### **Bank Record**

class dlkit.assessment.records.BankRecord Bases: dlkit.osid.records.OsidRecord

A record for a Bank.

The methods specified by the record type are available through the underlying object.

### **Bank Query Record**

```
class dlkit.assessment.records.BankQueryRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for a BankQuery.

The methods specified by the record type are available through the underlying object.

### **Bank Form Record**

class dlkit.assessment.records.BankFormRecord Bases: dlkit.osid.records.OsidRecord

A record for a BankForm.

The methods specified by the record type are available through the underlying object.

### **Bank Search Record**

class dlkit.assessment.records.BankSearchRecord Bases: dlkit.osid.records.OsidRecord

A record for a BankSearch.

The methods specified by the record type are available through the underlying object.

### **Response Record**

class dlkit.assessment.records.ResponseRecord Bases: dlkit.osid.records.OsidRecord

A record for a Response.

The methods specified by the record type are available through the underlying object.

# **Rules**

### Response

class dlkit.assessment.rules.Response Bases: dlkit.osid.rules.OsidCondition

A response to an assessment item.

This interface contains methods to set values in response to an assessmet item and mirrors the item record structure with the corresponding setters.

item\_id

Gets the  $\operatorname{Id}\nolimits$  of the  $\operatorname{Item}\nolimits$ 

Returns the assessment item  ${\tt Id}$ 

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### item

Gets the Item.

**Returns** the assessment item

Return type osid.assessment.Item

compliance: mandatory – This method must be implemented.

### get\_response\_record(item\_record\_type)

Gets the response record corresponding to the given Item record Type.

This method is used to retrieve an object implementing the requested record. The item\_record\_type may be the Type returned in get\_record\_types () or any of its parents in a Type hierarchy where has\_record\_type(item\_record\_type) is true.

Parameters item\_record\_type (osid.type.Type) - an item record type

**Returns** the response record

Return type osid.assessment.records.ResponseRecord

Raise NullArgument - item\_record\_type is null

**Raise** OperationFailed – unable to complete request

**Raise** Unsupported - has\_record\_type (item\_record\_type) is false

compliance: mandatory – This method must be implemented.

# Assessment.Authoring

# Summary

Assessment Authoring Open Service Interface Definitions assessment.authoring version 3.0.0

The Assessment OSID provides the means to create, access, and take assessments. An Assessment may represent a quiz, survey, or other evaluation that includes assessment Items. The OSID defines methods to describe the flow of control and the relationships among the objects. Assessment Items are extensible objects to capture various types of questions, such as a multiple choice or asset submission.

The Assessment service can br broken down into several distinct services:

- · Assessment Taking
- · Assessment and Item authoring
- Accessing and managing banks of assessments and items

Each of these service areas are covered by different session and object interfaces. The object interfaces describe both the structure of the assessment and follow an assessment management workflow. They are:

- Item: a question and answer pair
- Response: a response to an Item question
- Assessment : a set of Items
- AssessmentPart: A grouped set of Items for fancier assessment sequencing
- AssessmentOffering: An Assessment available for taking
- AssessmentTaken: An AssessmentOffering that has been completed or in progress

The AssessmentSession is used to take an assessment and review the results. It captures various ways an assessment can be taken which may include time constraints, the ability to suspend and resume, availability of an answer key, or access to a score or other evaluation. Care should be taken to understand the various interoperability issues in using this interface.

An AssessmentSession may be created using an AssessmentOffered or AssessmentTaken Id. If instantiated with an AssessmentOffered Id, an AssessmentTaken is implicitly created and further references to its state should be performed using the AssessmentTaken Id.

An AssessmentSession is a mapping of an AssessmentOffered to an Agent at a point in time. The resulting AssessmentTaken is an identifier representing this relationship.

On the authoring side, Items map to Assessments. An Item may appear in more than one Assessment. Item banks may be used to catalog sets of Items and/or sets of Assessments. Assessment Authoring Open Service Interface Definitions assessment.authoring version 3.0.0

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On the authoring side, Items map to Assessments. An Item may appear in more than one Assessment. Item banks may be used to catalog sets of Items and/or sets of Assessments.

# **Service Managers**

### **Assessment Authoring Profile**

```
class dlkit.services.assessment_authoring.AssessmentAuthoringProfile
Bases: dlkit.osid.managers.OsidProfile
```

The AssessmentAuthoringProfile describes the interoperability among assessment authoring services.

#### supports\_assessment\_part\_lookup()

Tests if looking up assessment part is supported.

**Returns** true if assessment part lookup is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_assessment\_part\_query()

Tests if querying assessment part is supported.

**Returns** true if assessment part query is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_assessment\_part\_admin()

Tests if an assessment part administrative service is supported.

Returns true if assessment part administration is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_assessment\_part\_item()

Tests if an assessment part item service is supported for looking up assessment part and item mappings.

Returns true if assessment part item service is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_assessment\_part\_item\_design()

Tests if an assessment part item design session is supported.

**Returns** true if an assessment part item design service is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_sequence\_rule\_lookup()

Tests if looking up sequence rule is supported.

**Returns** true if sequence rule lookup is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_sequence\_rule\_admin()

Tests if a sequence rule administrative service is supported.

Returns true if sequence rule administration is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### assessment\_part\_record\_types

Gets the supported AssessmentPart record types.

Returns a list containing the supported AssessmentPart record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### assessment\_part\_search\_record\_types

Gets the supported AssessmentPart search record types.

**Returns** a list containing the supported AssessmentPart search record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### sequence\_rule\_record\_types

Gets the supported SequenceRule record types.

**Returns** a list containing the supported SequenceRule record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

### sequence\_rule\_search\_record\_types

Gets the supported SequenceRule search record types.

Returns a list containing the supported SequenceRule search record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### sequence\_rule\_enabler\_record\_types

Gets the supported SequenceRuleEnabler record types.

Returns a list containing the supported SequenceRuleEnabler record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### sequence\_rule\_enabler\_search\_record\_types

Gets the supported SequenceRuleEnabler search record types.

**Returns** a list containing the supported SequenceRuleEnabler search record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

### **Assessment Authoring Manager**

class dlkit.services.assessment\_authoring.AssessmentAuthoringManager(proxy=None)
Bases: dlkit.osid.managers.OsidManager, dlkit.osid.sessions.OsidSession,
dlkit.services.assessment\_authoring.AssessmentAuthoringProfile

The assessment authoring manager provides access to assessment authoring sessions and provides interoperability tests for various aspects of this service.

The sessions included in this manager are:

•AssessmentPartLookupSession: a session to retrieve assessment part

- •AssessmentPartQuerySession: a session to query for assessment part
- •AssessmentPartSearchSession: a session to search for assessment part
- •AssessmentPartAdminSession: a session to create and delete assessment part
- •AssessmentPartNotificationSession: a session to receive notifications pertaining to assessment part changes
- •AssessmentPartBankSession: a session to look up assessment part bank mappings
- •AssessmentPartBankAssignmentSession: a session to manage assessment part to bank mappings
- •AssessmentPartSmartBankSession: a session to manage dynamic bank of assessment part
- •AssessmentPartItemSession: a session to look up assessment part to item mappings
- •AssessmentPartItemDesignSession: a session to map items to assessment parts
- •SequenceRuleLookupSession: a session to retrieve sequence rule

•SequenceRuleQuerySession: a session to query for sequence rule

•SequenceRuleSearchSession: a session to search for sequence rule

•SequenceRuleAdminSession: a session to create and delete sequence rule

•SequenceRuleNotificationSession: a session to receive notifications pertaining to sequence rule changes

- •SequenceRuleBankSession: a session to look up sequence rule bank mappings
- •SequenceRuleBankAssignmentSession: a session to manage sequence rule to bank mappings
- •SequenceRuleSmartBankSession: a session to manage dynamic bank of sequence rule
- •SequenceRuleEnablerLookupSession: a session to retrieve sequence rule enablers
- •SequenceRuleEnablerQuerySession: a session to query for sequence rule enablers
- •SequenceRuleEnablerSearchSession: a session to search for sequence rule enablers
- •SequenceRuleEnablerAdminSession: a session to create and delete sequence rule enablers

•SequenceRuleEnablerNotificationSession: a session to receive notifications pertaining to sequence rule enabler changes

•SequenceRuleEnablerBankSession: a session to look up sequence rule enabler bank mappings

•SequenceRuleEnablerBankAssignmentSession: a session to manage sequence rule enabler to bank mappings

•SequenceRuleEnablerSmartBankSession: a session to manage dynamic bank of sequence rule enablers

•SequenceRuleEnableRuleLookupSession: a session to look up sequence rule enabler mappings

•SequenceRuleEnablerRuleApplicationSession: a session to apply sequence rule enablers

# **Objects**

### Assessment Part

class dlkit.assessment\_authoring.objects.AssessmentPart

Bases: dlkit.osid.objects.OsidObject, dlkit.osid.markers.Containable, dlkit.osid.markers.Operable

An AssessmentPart represents a section of an assessment.

AssessmentParts may be visible as sections of an assessment or just used to clump together a set of items on which to hang sequence rules.

### assessment\_id

Gets the assessment Id to which this rule belongs.

Returns Id of an assessment

**Return type** osid.id.Id

compliance: mandatory – This method must be implemented.

### assessment

Gets the assessment to which this rule belongs.

**Returns** an assessment

Return type osid.assessment.Assessment

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

### has\_parent\_part()

Tests if this assessment part belongs to a parent assessment part.

**Returns** true if this part has a parent, false if a root

Return type boolean

*compliance: mandatory – This method must be implemented.* 

### assessment\_part\_id

Gets the parent assessment Id.

Returns Id of an assessment

Return type osid.id.Id

Raise IllegalState - has\_parent\_part() is false

compliance: mandatory – This method must be implemented.

#### assessment\_part

Gets the parent assessment.

**Returns** the parent assessment part

Return type osid.assessment.authoring.AssessmentPart

**Raise** IllegalState - has\_parent\_part() is false

**Raise** OperationFailed - unable to complete request

*compliance: mandatory – This method must be implemented.* 

#### is\_section()

Tests if this part should be visible as a section in an assessment.

If visible, this part will appear to the user as a separate section of the assessment. Typically, a section may not be under a non-sectioned part.

**Returns** true if this part is a section, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### weight

Gets an integral weight factor for this assessment part used for scoring.

The percentage weight for this part is this weight divided by the sum total of all the weights in the assessment.

**Returns** the weight

Return type cardinal

compliance: mandatory – This method must be implemented.

#### allocated\_time

Gets the allocated time for this part.

The allocated time may be used to assign fixed time limits to each item or can be used to estimate the total assessment time.

Returns allocated time

Return type osid.calendaring.Duration

compliance: mandatory – This method must be implemented.

#### child\_assessment\_part\_ids

Gets any child assessment part Ids.

Returns Ids of the child assessment parts

Return type osid.id.IdList

compliance: mandatory – This method must be implemented.

#### child\_assessment\_parts

Gets any child assessment parts.

**Returns** the child assessment parts

Return type osid.assessment.authoring.AssessmentPartList

**Raise** OperationFailed – unable to complete request

*compliance: mandatory – This method must be implemented.* 

### get\_assessment\_part\_record (assessment\_part\_record\_type)

Gets the assessment part record corresponding to the given AssessmentPart record Type.

This method is used to retrieve an object implementing the requested record. The assessment\_part\_record\_type be the Type returned in may qet record types() or any of its parents in а Type hierarchy where has\_record\_type (assessment\_part\_record\_type) is true.

Parameters assessment\_part\_record\_type (osid.type.Type) - the type of the record to retrieve

**Returns** the assessment part record

Return type osid.assessment.authoring.records.AssessmentPartRecord

**Raise** NullArgument - assessment\_part\_record\_type is null

Raise OperationFailed – unable to complete request

Raise Unsupported - has\_record\_type(assessment\_part\_record\_type) is
false

compliance: mandatory – This method must be implemented.

### Assessment Part Form

class dlkit.assessment\_authoring.objects.AssessmentPartForm

Bases: dlkit.osid.objects.OsidObjectForm, dlkit.osid.objects. OsidContainableForm, dlkit.osid.objects.OsidOperableForm

This is the form for creating and updating AssessmentParts.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the AssessmentAuthoringSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

#### weight\_metadata

Gets the metadata for the weight.

Returns metadata for the weight

Return type osid.Metadata

*compliance: mandatory – This method must be implemented.* 

### weight

### allocated\_time\_metadata

Gets the metadata for the allocated time.

Returns metadata for the allocated time

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

#### allocated\_time

### get\_assessment\_part\_form\_record (assessment\_part\_record\_type)

Gets the AssessmentPartFormRecord corresponding to the given assessment record Type.

Parameters assessment\_part\_record\_type (osid.type.Type) - the assessment
 part record type

Returns the assessment part record

Return type osid.assessment.authoring.records. AssessmentPartFormRecord

**Raise** NullArgument - assessment\_part\_record\_type is null

Raise OperationFailed - unable to complete request

Raise Unsupported - has\_record\_type(assessment\_part\_record\_type) is
false

compliance: mandatory – This method must be implemented.

### **Assessment Part List**

class dlkit.assessment\_authoring.objects.AssessmentPartList
 Bases: dlkit.osid.objects.OsidList

Like all OsidLists, AssessmentPartList provides a means for accessing AssessmentPart elements sequentially either one at a time or many at a time.

Examples: while (apl.hasNext()) { AssessmentPart assessmentPart = apl.getNextAssessmentPart(); }

or

while (apl.hasNext()) { AssessmentPart[] assessmentParts = apl.hetNextAssessmentParts(apl.available());

}

#### next\_assessment\_part

Gets the next AssessmentPart in this list.

**Returns** the next AssessmentPart in this list. The has\_next() method should be used to test that a next AssessmentPart is available before calling this method.

Return type osid.assessment.authoring.AssessmentPart

**Raise** IllegalState – no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

#### get\_next\_assessment\_parts(n)

Gets the next set of AssessmentPart elements in this list which must be less than or equal to the number returned from available().

Parameters n (cardinal) - the number of AssessmentPart elements requested which should be less than or equal to available()

**Returns** an array of AssessmentPart elements. The length of the array is less than or equal to the number specified.

Return type osid.assessment.authoring.AssessmentPart

**Raise** IllegalState – no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

### **Sequence Rule**

```
class dlkit.assessment_authoring.objects.SequenceRule
Bases: dlkit.osid.objects.OsidRule
```

A SequenceRule defines the ordering of AssessmentParts.

### assessment\_part\_id

Gets the assessment part Id to which this rule belongs.

Returns Id of an assessment part

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

### assessment\_part

Gets the assessment part to which this rule belongs.

Returns an assessment part

Return type osid.assessment.authoring.AssessmentPart

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

### next\_assessment\_part\_id

Gets the next assessment part Id for success of this rule.

Returns Id of an assessment part

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### next\_assessment\_part

Gets the next assessment part for success of this rule.

Returns an assessment part

Return type osid.assessment.authoring.AssessmentPart

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

#### minimum\_score

Gets the minimum score expressed as an integer (0-100) for this rule.

Returns minimum score

Return type cardinal

compliance: mandatory – This method must be implemented.

### maximum\_score

Gets the maximum score expressed as an integer (0-100) for this rule.

Returns maximum score

Return type cardinal

compliance: mandatory – This method must be implemented.

## is\_cumulative()

Tests if the score is applied to all previous assessment parts.

**Returns** true if the score is applied to all previous assessment parts, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### applied\_assessment\_part\_ids

Qualifies is\_cumulative() to apply to a specific list of assessment parts.

If is\_cumulative() is true, this method may return an empty list to mean all previous assessment parts.

Returns list of assessment parts

Return type osid.id.IdList

**Raise** IllegalState - is\_cumulative() is false

compliance: mandatory – This method must be implemented.

### applied\_assessment\_parts

Qualifies is\_cumulative() to apply to a specific list of assessment parts.

If is\_cumulative() is true, this method may return an empty list to mean all previous assessment parts.

Returns list of assessment parts

Return type osid.assessment.authoring.AssessmentPartList

**Raise** IllegalState - is\_cumulative() is false

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

#### get\_sequence\_rule\_record (sequence\_rule\_record\_type)

Gets the assessment sequence rule record corresponding to the given SequenceRule record Type.

This method is used to retrieve an object implementing the requested record. The sequence\_rule\_record\_type may be the Type returned in get\_record\_types() or any of its parents in a Type hierarchy where has\_record\_type(sequence\_rule\_record\_type) is true.

**Parameters sequence\_rule\_record\_type** (osid.type.Type) - the type of the record to retrieve

**Returns** the assessment sequence rule record

Return type osid.assessment.authoring.records.SequenceRuleRecord

**Raise** NullArgument - sequence\_rule\_record\_type is null

Raise OperationFailed - unable to complete request

Raise Unsupported - has\_record\_type(sequence\_rule\_record\_type) is
false

compliance: mandatory – This method must be implemented.

### **Sequence Rule Form**

class dlkit.assessment\_authoring.objects.SequenceRuleForm Bases: dlkit.osid.objects.OsidRuleForm

This is the form for creating and updating sequence rules.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the SequenceSession For each data element that may be set, metadata may be examined to provide display hints or data constraints.

### minimum\_score\_metadata

Gets the metadata for the minimum score.

Returns metadata for the minimum score

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

### minimum\_score

### maximum\_score\_metadata

Gets the metadata for the maximum score.

Returns metadata for the maximum score

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

### maximum\_score

### cumulative\_metadata

Gets the metadata for the cumulative flag.

Returns metadata for the cumulative flag

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

### cumulative

### applied\_assessment\_parts\_metadata

Gets the metadata for the applied assessment parts.

**Returns** metadata for the applied assessment parts

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

#### apply\_assessment\_parts (assessment\_part\_ids)

Designates assessment parts to which the rule applies.

**Parameters assessment\_part\_ids** (osid.id.Id[]) - the parts to which this rule should apply

**Raise** InvalidArgument - assessment\_part\_ids is invalid

Raise NoAccess-Metadata.isReadOnly() is true

**Raise** NullArgument - assessment\_part\_ids is null

compliance: mandatory – This method must be implemented.

### get\_sequence\_rule\_form\_record (sequence\_rule\_record)

Gets the SequenceRuleFormRecord corresponding to the given sequence rule record Type.

**Parameters** sequence\_rule\_record (osid.type.Type) - a sequence rule record type

**Returns** the sequence rule record

**Return type** osid.assessment.authoring.records. SequenceRuleFormRecord

**Raise** NullArgument - sequence\_rule\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type(asequence\_rule\_record\_type) is false

compliance: mandatory – This method must be implemented.

### Sequence Rule List

class dlkit.assessment\_authoring.objects.SequenceRuleList Bases: dlkit.osid.objects.OsidList

Like all OsidLists, SequenceRuleList provides a means for accessing SequenceRule elements sequentially either one at a time or many at a time.

Examples: while (srl.hasNext()) { AssessmentSequenceRule rule = srl.getNextAssessmentSequenceRule(); }

#### or

while (srl.hasNext()) { AssessmentSequenceRule[] rules = srl.getNextAssessmentSequenceRules(srl.available());

### }

### next\_sequence\_rule

Gets the next SequenceRule in this list.

**Returns** the next SequenceRule in this list. The has\_next() method should be used to test that a next SequenceRule is available before calling this method.

Return type osid.assessment.authoring.SequenceRule

**Raise** IllegalState – no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

### get\_next\_sequence\_rules (n)

Gets the next set of SequenceRule elements in this list which must be less than or equal to the number returned from available().

- **Parameters n** (cardinal) the number of SequenceRule elements requested which should be less than or equal to available()
- **Returns** an array of SequenceRule elements. The length of the array is less than or equal to the number specified.

Return type osid.assessment.authoring.SequenceRule

**Raise** IllegalState – no more elements available in this list

Raise OperationFailed - unable to complete request

#### compliance: mandatory – This method must be implemented.

# Queries

### **Assessment Part Query**

class dlkit.assessment\_authoring.queries.AssessmentPartQuery

Bases: dlkit.osid.queries.OsidObjectQuery, dlkit.osid.queries. OsidContainableQuery, dlkit.osid.queries.OsidOperableQuery

This is the query for searching assessment parts.

Each method match request produces an AND term while multiple invocations of a method produces a nested OR.

match\_assessment\_id (assessment\_id, match)

Sets the assessment Id for this query.

#### **Parameters**

- assessment\_id (osid.id.Id) an assessment Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - assessment\_id is null

compliance: mandatory – This method must be implemented.

#### assessment\_id\_terms

#### supports\_assessment\_query()

Tests if an AssessmentQuery is available.

**Returns** true if an assessment query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### assessment\_query

Gets the query for an assessment.

Multiple retrievals produce a nested OR term.

Returns the assessment query

Return type osid.assessment.AssessmentQuery

**Raise** Unimplemented - supports\_assessment\_query() is false

compliance: optional – This method must be implemented if "supports\_assessment\_query()" is "true".

### assessment\_terms

match\_parent\_assessment\_part\_id(assessment\_part\_id, match)

Sets the assessment part Id for this query.

Parameters

- assessment\_part\_id (osid.id.Id) an assessment part Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - assessment\_part\_id is null

compliance: mandatory – This method must be implemented.

parent\_assessment\_part\_id\_terms

### supports\_parent\_assessment\_part\_query()

Tests if an AssessmentPartQuery is available.

Returns true if an assessment part query is available, false otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

### parent\_assessment\_part\_query

Gets the query for an assessment part.

Multiple retrievals produce a nested OR term.

**Returns** the assessment part query

Return type osid.assessment.authoring.AssessmentPartQuery

Raise Unimplemented - supports\_parent\_assessment\_part\_query() is
false

compliance: optional – This method must be implemented if "supports\_parent\_assessment\_part\_query()" is "true".

#### match\_any\_parent\_assessment\_part (match)

Matches assessment parts with any parent assessment part.

**Parameters match** (boolean) – true to match assessment parts with any parent, false to match assessment parts with no parents

compliance: mandatory – This method must be implemented.

### parent\_assessment\_part\_terms

### match\_section(match)

Matches assessment parts that are also used as sections.

Parameters match (boolean) - true for a positive match, false for a negative match

compliance: mandatory – This method must be implemented.

### section\_terms

match\_weight (low, high, match)

Matches assessment parts that fall in between the given weights inclusive.

### Parameters

- low (cardinal) low end of range
- high (cardinal) high end of range
- match (boolean) true for a positive match, false for a negative match

Raise InvalidArgument - high is less than low

compliance: mandatory – This method must be implemented.

### match\_any\_weight (match)

Matches assessment parts with any weight assigned.

**Parameters match** (boolean) - true to match assessment parts with any wieght, false to match assessment parts with no weight

compliance: mandatory – This method must be implemented.

### weight\_terms

#### match\_allocated\_time (low, high, match)

Matches assessment parts hose allocated time falls in between the given times inclusive.

### Parameters

- low (osid.calendaring.Duration) low end of range
- high (osid.calendaring.Duration) high end of range
- match (boolean) true for a positive match, false for a negative match

Raise InvalidArgument - high is less than low

compliance: mandatory – This method must be implemented.

#### match\_any\_allocated\_time(match)

Matches assessment parts with any time assigned.

**Parameters match** (boolean) – true to match assessment parts with any alloocated time, false to match assessment parts with no allocated time

compliance: mandatory – This method must be implemented.

#### allocated\_time\_terms

match\_child\_assessment\_part\_id(assessment\_part\_id, match)

Sets the assessment part  ${\tt Id}$  for this query.

### Parameters

- assessment\_part\_id (osid.id.Id) an assessment part Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - assessment\_part\_id is null

compliance: mandatory – This method must be implemented.

### child\_assessment\_part\_id\_terms

#### supports\_child\_assessment\_part\_query()

Tests if an AssessmentPartQuery is available.

**Returns** true if an assessment part query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### child\_assessment\_part\_query

Gets the query for an assessment part.

Multiple retrievals produce a nested OR term.

**Returns** the assessment part query

Return type osid.assessment.authoring.AssessmentPartQuery

Raise Unimplemented-supports\_child\_assessment\_part\_query() is false

compliance: optional – This method must be implemented if ''supports\_child\_assessment\_part\_query()'' is ''true''.

### match\_any\_child\_assessment\_part (match)

Matches assessment parts with any child assessment part.

**Parameters match** (boolean) – true to match assessment parts with any children, false to match assessment parts with no children

compliance: mandatory – This method must be implemented.

#### child\_assessment\_part\_terms

match\_bank\_id(bank\_id, match)

Matches constrainers mapped to the bank.

#### **Parameters**

- bank\_id (osid.id.Id) the bank Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - bank\_id is null

compliance: mandatory – This method must be implemented.

#### bank\_id\_terms

### supports\_bank\_query()

Tests if an BankQuery is available.

**Returns** true if a bank query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### bank\_query

Gets the query for a bank.

Multiple retrievals produce a nested OR term.

**Returns** the bank query

Return type osid.assessment.BankQuery

Raise Unimplemented - supports\_bank\_query() is false

compliance: optional – This method must be implemented if "supports\_bank\_query()" is "true".

### bank\_terms

#### get\_assessment\_part\_query\_record (assessment\_part\_record\_type)

Gets the assessment part query record corresponding to the given AssessmentPart record Type.

Multiple retrievals produce a nested OR term.

- **Parameters assessment\_part\_record\_type** (osid.type.Type) an assessment part record type
- **Returns** the assessment part query record
- Return type osid.assessment.authoring.records. AssessmentPartQueryRecord

**Raise** NullArgument - assessment\_part\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type(assessment\_part\_record\_type) is false

compliance: mandatory – This method must be implemented.

### **Sequence Rule Query**

```
class dlkit.assessment_authoring.queries.SequenceRuleQuery
Bases: dlkit.osid.queries.OsidRuleQuery
```

This is the query for searching sequence rules.

Each method match specifies a AND term while multiple invocations of the same method produce a nested OR.

match\_assessment\_part\_id (assessment\_part\_id, match)
Sets the assessment part Id for this query.

**Parameters** 

- assessment\_part\_id (osid.id.Id) an assessment part Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - assessment\_part\_id is null

compliance: mandatory – This method must be implemented.

### assessment\_part\_id\_terms

#### supports\_assessment\_part\_query()

Tests if an AssessmentPartQuery is available.

Returns true if an assessment part query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### assessment\_part\_query

Gets the query for an assessment part.

Multiple retrievals produce a nested OR term.

**Returns** the assessment part query

Return type osid.assessment.authoring.AssessmentPartQuery

Raise Unimplemented-supports\_assessment\_part\_query() is false

compliance: optional – This method must be implemented if 'supports\_assessment\_part\_query()'' is ''true''.

### assessment\_part\_terms

```
match_next_assessment_part_id (assessment_part_id, match)
```

Sets the assessment part  ${\tt Id}$  for this query.

**Parameters** 

- assessment\_part\_id (osid.id.Id) an assessment part Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - assessment\_part\_id is null

compliance: mandatory – This method must be implemented.

### next\_assessment\_part\_id\_terms

### supports\_next\_assessment\_part\_query()

Tests if an AssessmentPartQuery is available.

**Returns** true if an assessment part query is available, false otherwise

### Return type boolean

compliance: mandatory – This method must be implemented.

### next\_assessment\_part\_query

Gets the query for an assessment part.

Multiple retrievals produce a nested OR term.

**Returns** the assessment part query

Return type osid.assessment.authoring.AssessmentPartQuery

Raise Unimplemented - supports\_next\_assessment\_part\_query() is false

compliance: optional – This method must be implemented if ''supports\_next\_assessment\_part\_query()'' is ''true''.

### next\_assessment\_part\_terms

### match\_minimum\_score (low, high, match)

Matches minimum scores that fall in between the given scores inclusive.

### Parameters

- low (cardinal) low end of range
- high (cardinal) high end of range
- match (boolean) true for a positive match, false for a negative match

**Raise** InvalidArgument – high is less than low

compliance: mandatory – This method must be implemented.

#### match\_any\_minimum\_score (match)

Matches assessment parts with any minimum score assigned.

**Parameters match** (boolean) – true to match assessment parts with any minimum score, false to match assessment parts with no minimum score

compliance: mandatory – This method must be implemented.

### minimum\_score\_terms

### match\_maximum\_score (low, high, match)

Matches maximum scores that fall in between the given scores inclusive.

### Parameters

- low (cardinal) low end of range
- high (cardinal) high end of range
- match (boolean) true for a positive match, false for a negative match

Raise InvalidArgument - high is less than low

compliance: mandatory – This method must be implemented.

#### match\_any\_maximum\_score (match)

Matches assessment parts with any maximum score assigned.

**Parameters match** (boolean) – true to match assessment parts with any maximum score, false to match assessment parts with no maximum score

compliance: mandatory – This method must be implemented.

#### maximum\_score\_terms

match\_cumulative (match)
 Matches cumulative rules.

**Parameters match** (boolean) - true for a positive match, false for a negative match

compliance: mandatory – This method must be implemented.

#### cumulative\_terms

match\_applied\_assessment\_part\_id(assessment\_part\_id, match)

Sets the assessment part Id for this query.

**Parameters** 

• assessment\_part\_id (osid.id.Id) - an assessment part Id

• match (boolean) - true for a positive match, false for a negative match

**Raise** NullArgument - assessment\_part\_id is null

compliance: mandatory – This method must be implemented.

### applied\_assessment\_part\_id\_terms

#### supports\_applied\_assessment\_part\_query()

Tests if an AssessmentPartQuery is available.

Returns true if an assessment part query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### applied\_assessment\_part\_query

Gets the query for an assessment part.

Multiple retrievals produce a nested OR term.

**Returns** the assessment part query

**Return type** osid.assessment.authoring.AssessmentPartQuery

Raise Unimplemented - supports\_applied\_assessment\_part\_query() is
false

compliance: optional – This method must be implemented if 'supports\_applied\_assessment\_part\_query()'' is ''true''.

### match\_any\_applied\_assessment\_part (match)

Matches assessment parts with any applied assessment part.

**Parameters match** (boolean) - true to match assessment parts with any applied assessment part, false to match assessment parts with no applied assessment parts

compliance: mandatory – This method must be implemented.

### applied\_assessment\_part\_terms

match\_bank\_id(bank\_id, match)

Matches constrainers mapped to the bank.

#### Parameters

- **bank\_id** (osid.id.Id) the bank Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - bank\_id is null

compliance: mandatory – This method must be implemented.

### bank\_id\_terms

supports\_bank\_query()

Tests if an BankQuery is available.

**Returns** true if a bank query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### bank\_query

Gets the query for a bank.

Multiple retrievals produce a nested OR term.

**Returns** the bank query

Return type osid.assessment.BankQuery

Raise Unimplemented - supports\_bank\_query() is false

compliance: optional – This method must be implemented if ''supports\_bank\_query()'' is ''true''.

### bank\_terms

### get\_sequence\_rule\_query\_record (sequence\_rule\_record\_type)

Gets the sequence rule query record corresponding to the given SequenceRule record Type.

Multiple record retrievals produce a nested OR term.

Parameters sequence\_rule\_record\_type (osid.type.Type) - a sequence rule
 record type

**Returns** the sequence rule query record

```
Return type osid.assessment.authoring.records.
SequenceRuleQueryRecord
```

Raise NullArgument - sequence\_rule\_record\_type is null

Raise OperationFailed - unable to complete request

```
Raise Unsupported - has_record_type(sequence_rule_record_type) is
false
```

compliance: mandatory – This method must be implemented.

# Records

### **Assessment Part Record**

```
class dlkit.assessment_authoring.records.AssessmentPartRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for an AssessmentPart.

The methods specified by the record type are available through the underlying object.

### **Assessment Part Query Record**

class dlkit.assessment\_authoring.records.AssessmentPartQueryRecord Bases: dlkit.osid.records.OsidRecord

A record for an AssessmentPartQuery.

The methods specified by the record type are available through the underlying object.

### **Assessment Part Form Record**

class dlkit.assessment\_authoring.records.AssessmentPartFormRecord Bases: dlkit.osid.records.OsidRecord

A record for an AssessmentPartForm.

The methods specified by the record type are available through the underlying object.

### **Assessment Part Search Record**

class dlkit.assessment\_authoring.records.AssessmentPartSearchRecord Bases: dlkit.osid.records.OsidRecord

A record for an AssessmentPartSearch.

The methods specified by the record type are available through the underlying object.

### Sequence Rule Record

class dlkit.assessment\_authoring.records.SequenceRuleRecord Bases: dlkit.osid.records.OsidRecord

A record for a SequenceRule.

The methods specified by the record type are available through the underlying object.

### Sequence Rule Query Record

class dlkit.assessment\_authoring.records.SequenceRuleQueryRecord Bases: dlkit.osid.records.OsidRecord

A record for a SequenceRuleQuery.

The methods specified by the record type are available through the underlying object.

### Sequence Rule Form Record

class dlkit.assessment\_authoring.records.SequenceRuleFormRecord Bases: dlkit.osid.records.OsidRecord

A record for a SequenceRuleForm.

The methods specified by the record type are available through the underlying object.

### Sequence Rule Search Record

class dlkit.assessment\_authoring.records.SequenceRuleSearchRecord Bases: dlkit.osid.records.OsidRecord

A record for a SequenceRuleSearch.

The methods specified by the record type are available through the underlying object.

# Commenting

# Summary

Commenting Open Service Interface Definitions commenting version 3.0.0

The Commenting OSID provides a means of relating user comments and ratings to OSID Objects.

The Commenting OSID may be used as an auxiliary service orchestrated with other OSIDs to either provide administrative comments as well as create a social network-esque comment and rating service to various OsidObjects.

### Comments

Comments contain text entries logged by date and Agent. A Comment may also include a rating represented by a Grade defined in a GradeSystem. The RatingLookupSession may be used to query cumulative scores across an object reference or the entire Book.

Comments are OsidRelationships between a commentor and a reference Id. The relationship defines dates for which the comment and/or rating is effective.

#### Commentors

An Agent comments on something. As a person is represented by a Resource in the Resource OSID, the Comments provide access to both the commenting Agent and the related Resource to avoid the need of an additional service orchestration for resolving the Agent.

#### Cataloging

Comments are cataloged in Books which may also be grouped hierarchically to federate multiple collections of comments.

#### Sub Packages

The Commenting OSID includes a Commenting Batch OSID for managing Comments and Books in bulk. Commenting Open Service Interface Definitions commenting version 3.0.0

The Commenting OSID provides a means of relating user comments and ratings to OSID Objects.

The Commenting OSID may be used as an auxiliary service orchestrated with other OSIDs to either provide administrative comments as well as create a social network-esque comment and rating service to various OsidObjects.

#### Comments

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Sub Packages

The Commenting OSID includes a Commenting Batch OSID for managing Comments and Books in bulk.

# **Service Managers**

### **Commenting Profile**

```
class dlkit.services.commenting.CommentingProfile
    Bases: dlkit.osid.managers.OsidProfile
```

The commenting profile describes the interoperability among commenting services.

#### supports\_comment\_lookup()

Tests for the availability of a comment lookup service.

**Returns** true if comment lookup is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_comment\_query()

Tests if querying comments is available.

**Returns** true if comment query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_comment\_admin()

Tests if managing comments is available.

Returns true if comment admin is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_book\_lookup()

Tests for the availability of an book lookup service.

**Returns** true if book lookup is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_book\_admin()

Tests for the availability of a book administrative service for creating and deleting books.

Returns true if book administration is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_book\_hierarchy()

Tests for the availability of a book hierarchy traversal service.

Returns true if book hierarchy traversal is available, false otherwise

**Return type** boolean

*compliance: mandatory – This method must be implemented.* 

### supports\_book\_hierarchy\_design()

Tests for the availability of a book hierarchy design service.

**Returns** true if book hierarchy design is available, false otherwise

**Return type** boolean

compliance: mandatory – This method must be implemented in all providers.

#### comment\_record\_types

Gets the supported Comment record types.

**Returns** a list containing the supported comment record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### comment\_search\_record\_types

Gets the supported comment search record types.

**Returns** a list containing the supported comment search record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### book\_record\_types

Gets the supported Book record types.

**Returns** a list containing the supported book record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### book\_search\_record\_types

Gets the supported book search record types.

**Returns** a list containing the supported book search record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

### **Commenting Manager**

class dlkit.services.commenting.CommentingManager (proxy=None)

Bases: dlkit.osid.managers.OsidManager, dlkit.osid.sessions.OsidSession, dlkit.services.commenting.CommentingProfile

The commenting manager provides access to commenting sessions and provides interoperability tests for various aspects of this service.

The sessions included in this manager are:

•CommentLookupSession: a session to lookup comments

•RatingLookupSession: a session to lookup comments

•CommentQuerySession: a session to query comments

•CommentSearchSession: a session to search comments

•CommentAdminSession: a session to manage comments

•CommentNotificationSession: a session to subscribe to notifications of comment changes

•CommentBookSession: a session for looking up comment and book mappings

•CommentBookAssignmentSession: a session for managing comment and book mappings

•CommentSmartBookSession: a session to manage dynamic comment books

•BookLookupSession: a session to retrieve books

•BookQuerySession: a session to query books

•BookSearchSession: a session to search for books

•BookAdminSession: a session to create, update and delete books

•BookNotificationSession: a session to receive notifications for changes in books

•BookHierarchyTraversalSession: a session to traverse hierarchies of books

•BookHierarchyDesignSession: a session to manage hierarchies of books

The commenting manager also provides a profile for determing the supported search types supported by this service.

### commenting\_batch\_manager

Gets a CommentingBatchManager.

Returns a CommentingBatchManager

Return type osid.commenting.batch.CommentingBatchManager

**Raise** OperationFailed – unable to complete request

Raise Unimplemented - supports\_commenting\_batch() is false

compliance: optional – This method must be implemented if "supports\_commenting\_batch()" is "true".

### **Book Lookup Methods**

CommentingManager.can\_lookup\_books()

Tests if this user can perform Book lookups.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may not offer lookup operations to unauthorized users.

Returns false if lookup methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### CommentingManager.use\_comparative\_book\_view()

The returns from the book methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

```
CommentingManager.use_plenary_book_view()
A complete view of the Book returns is desired.
```

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

```
CommentingManager.get_book(book_id)
```

Gets the Book specified by its  ${\tt Id}.$ 

In plenary mode, the exact Id is found or a NotFound results. Otherwise, the returned Book may have a different Id than requested, such as the case where a duplicate Id was assigned to a Book and retained for compatibility.

Parameters book\_id (osid.id.Id) - Id of the Book

Returns the book

Return type osid.commenting.Book

Raise NotFound - book\_id not found

Raise NullArgument - book\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method is must be implemented.

```
CommentingManager.get_books_by_ids (book_ids)
Gets a BookList corresponding to the given IdList.
```

In plenary mode, the returned list contains all of the books specified in the Id list, in the order of the list, including duplicates, or an error results if an Id in the supplied list is not found or inaccessible. Otherwise, inaccessible Books may be omitted from the list and may present the elements in any order including returning a unique set.

Parameters book\_ids (osid.id.IdList) - the list of Ids to retrieve

**Returns** the returned Book list

Return type osid.commenting.BookList

Raise NotFound - an Id was not found

Raise NullArgument - book\_ids is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

CommentingManager.get\_books\_by\_genus\_type(book\_genus\_type)

Gets a BookList corresponding to the given book genus Type which does not include books of genus types derived from the specified Type.

In plenary mode, the returned list contains all known books or an error results. Otherwise, the returned list may contain only those books that are accessible through this session.

**Parameters book\_genus\_type** (osid.type.Type) - a book genus type

Returns the returned Book list

Return type osid.commenting.BookList

Raise NullArgument - book\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

CommentingManager.get\_books\_by\_parent\_genus\_type(book\_genus\_type)

Gets a BookList corresponding to the given book genus Type and include any additional books with genus types derived from the specified Type.

In plenary mode, the returned list contains all known books or an error results. Otherwise, the returned list may contain only those books that are accessible through this session.

**Parameters book\_genus\_type** (osid.type.Type) - a book genus type

Returns the returned Book list

Return type osid.commenting.BookList

Raise NullArgument - book\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented.* 

CommentingManager.get\_books\_by\_record\_type (book\_record\_type) Gets a BookList containing the given book record Type.

In plenary mode, the returned list contains all known books or an error results. Otherwise, the returned list may contain only those books that are accessible through this session.

Parameters book\_record\_type (osid.type.Type) - a book record type

**Returns** the returned Book list

Return type osid.commenting.BookList

Raise NullArgument - book\_record\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented.* 

CommentingManager.get\_books\_by\_provider (*resource\_id*) Gets a BookList from the given provider "….

In plenary mode, the returned list contains all known books or an error results. Otherwise, the returned list may contain only those books that are accessible through this session.

Parameters resource\_id (osid.id.Id) - a resource Id

Returns the returned Book list

Return type osid.commenting.BookList

Raise NullArgument - resource\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

CommentingManager.**books** Gets all Books.

In plenary mode, the returned list contains all known books or an error results. Otherwise, the returned list may contain only those books that are accessible through this session.

Returns a list of Books

Return type osid.commenting.BookList

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

### **Book Admin Methods**

CommentingManager.can\_create\_books()

Tests if this user can create Books.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating a Book will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer create operations to unauthorized users.

Returns false if Book creation is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

CommentingManager.can\_create\_book\_with\_record\_types (*book\_record\_types*) Tests if this user can create a single Book using the desired record types.

While CommentingManager.getBookRecordTypes() can be used to examine which records are supported, this method tests which record(s) are required for creating a specific Book. Providing an empty array tests if a Book can be created with no records.

Parameters book\_record\_types (osid.type.Type[]) - array of book record
types

**Returns** true if Book creation using the specified record Types is supported, false otherwise

Return type boolean

Raise NullArgument - book\_record\_types is null

compliance: mandatory – This method must be implemented.

CommentingManager.get\_book\_form\_for\_create(book\_record\_types)

Gets the book form for creating new books.

A new form should be requested for each create transaction.

Parameters book\_record\_types (osid.type.Type[]) - array of book record
types

**Returns** the book form

Return type osid.commenting.BookForm

**Raise** NullArgument - book\_record\_types is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

Raise Unsupported – unable to get form for requested record types

compliance: mandatory – This method must be implemented.

CommentingManager.create\_book(book\_form)

Creates a new Book.

**Parameters book\_form** (osid.commenting.BookForm) - the form for this Book

Returns the new Book

Return type osid.commenting.Book

**Raise** IllegalState - book\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

Raise NullArgument - book\_form is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

**Raise** Unsupported – book\_form did not originte from get\_book\_form\_for\_create()

*compliance: mandatory – This method must be implemented.* 

CommentingManager.can\_update\_books()

Tests if this user can update Books.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating a Book will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer update operations to unauthorized users.

Returns false if Book modification is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

CommentingManager.get\_book\_form\_for\_update (*book\_id*) Gets the book form for updating an existing book.

A new book form should be requested for each update transaction.

Parameters book\_id (osid.id.Id) - the Id of the Book

Returns the book form

Return type osid.commenting.BookForm

Raise NotFound - book\_id is not found

**Raise** NullArgument - book\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

CommentingManager.update\_book (book\_form) Updates an existing book.

**Parameters book\_form** (osid.commenting.BookForm) – the form containing the elements to be updated

Raise IllegalState - book\_form already used in an update transaction

Raise InvalidArgument - the form contains an invalid value

Raise NullArgument - book\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

**Raise** Unsupported – book\_form did not originte from get\_book\_form\_for\_update()

compliance: mandatory – This method must be implemented.

### CommentingManager.can\_delete\_books()

Tests if this user can delete Books A return of true does not guarantee successful authorization.

A return of false indicates that it is known deleting a Book will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer delete operations to unauthorized users.

**Returns** false if Book deletion is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

CommentingManager.delete\_book(book\_id)

Deletes a Book.

Parameters book\_id (osid.id.Id) - the Id of the Book to remove

Raise NotFound - book\_id not found

Raise NullArgument - book\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

```
CommentingManager.can_manage_book_aliases()
```

Tests if this user can manage Id aliases for Books.

A return of true does not guarantee successful authorization. A return of false indicates that it is known changing an alias will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer alias operations to an unauthorized user.

Returns false if Book aliasing is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

CommentingManager.alias\_book(book\_id, alias\_id)

Adds an Id to a Book for the purpose of creating compatibility.

The primary Id of the Book is determined by the provider. The new Id performs as an alias to the primary Id. If the alias is a pointer to another book, it is reassigned to the given book Id.

### Parameters

• **book\_id** (osid.id.Id) - the Id of a Book

• alias\_id (osid.id.Id) - the alias Id

Raise AlreadyExists - alias\_id is already assigned

Raise NotFound - book\_id not found

Raise NullArgument - book\_id or alias\_id is null

**Raise** OperationFailed – unable to complete request

 $Raise \ {\tt PermissionDenied-authorization\ failure}$ 

compliance: mandatory – This method must be implemented.

### **Book Hierarchy Methods**

CommentingManager.book\_hierarchy\_id Gets the hierarchy Id associated with this session.

Returns the hierarchy Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

### CommentingManager.book\_hierarchy

Gets the hierarchy associated with this session.

Returns the hierarchy associated with this session

Return type osid.hierarchy.Hierarchy

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

### CommentingManager.can\_access\_book\_hierarchy()

Tests if this user can perform hierarchy queries.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations.

**Returns** false if hierarchy traversal methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### CommentingManager.use\_comparative\_book\_view()

The returns from the book methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

# CommentingManager.use\_plenary\_book\_view()

A complete view of the Book returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

CommentingManager.root\_book\_ids

Gets the root book Ids in this hierarchy.

Returns the root book Ids

Return type osid.id.IdList

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

### CommentingManager.root\_books

Gets the root books in the book hierarchy.

A node with no parents is an orphan. While all book Ids are known to the hierarchy, an orphan does not appear in the hierarchy unless explicitly added as a root node or child of another node.

**Returns** the root books

Return type osid.commenting.BookList

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method is must be implemented.

CommentingManager.has\_parent\_books (*book\_id*) Tests if the Book has any parents.

**Parameters book\_id** (osid.id.Id) - a book Id

**Returns** true if the book has parents, f alse otherwise

Return type boolean

Raise NotFound - book\_id is not found

**Raise** NullArgument - book\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

CommentingManager.**is\_parent\_of\_book**(*id\_, book\_id*) Tests if an Id is a direct parent of book.

### Parameters

- id (osid.id.Id) an Id
- **book\_id** (osid.id.Id) the Id of a book

Returns true if this id is a parent of book\_id, false otherwise

Return type boolean

Raise NotFound - book\_id is not found

Raise NullArgument - id or book\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented. implementation notes:* If id not found return false.

CommentingManager.get\_parent\_book\_ids (*book\_id*) Gets the parent Ids of the given book.

**Parameters book\_id** (osid.id.Id) - a book Id

**Returns** the parent Ids of the book

Return type osid.id.IdList

**Raise** NotFound - book\_id is not found

**Raise** NullArgument - book\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

### CommentingManager.get\_parent\_books(book\_id)

Gets the parent books of the given id.

Parameters book\_id (osid.id.Id) - the Id of the Book to query

Returns the parent books of the id

Return type osid.commenting.BookList

**Raise** NotFound – a Book identified by Id is not found

Raise NullArgument - book\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

CommentingManager.is\_ancestor\_of\_book(id\_, book\_id)

Tests if an Id is an ancestor of a book.

### **Parameters**

- id (osid.id.Id) an Id
- **book\_id** (osid.id.Id) the Id of a book

Returns true if this id is an ancestor of book\_id, false otherwise

Return type boolean

Raise NotFound - book\_id is not found

Raise NullArgument - id or book\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented. implementation notes*: If id not found return false.

CommentingManager.has\_child\_books(book\_id) Tests if a book has any children.

Parameters book\_id (osid.id.Id) - a book Id

Returns true if the book\_id has children, false otherwise

Return type boolean

Raise NotFound - book\_id is not found

Raise NullArgument - book\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

CommentingManager.**is\_child\_of\_book** (*id\_*, *book\_id*) Tests if a book is a direct child of another.

### Parameters

- id (osid.id.Id) an Id
- book\_id (osid.id.Id) the Id of a book

**Returns** true if the id is a child of book\_id, false otherwise

Return type boolean

Raise NotFound - book\_id is not found

Raise NullArgument - id or book\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented. implementation notes*: If id not found return false.

CommentingManager.get\_child\_book\_ids (book\_id) Gets the child Ids of the given book.

Parameters book\_id (osid.id.Id) - the Id to query

**Returns** the children of the book

Return type osid.id.IdList

Raise NotFound - book\_id is not found

Raise NullArgument - book\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory - This method must be implemented.

CommentingManager.get\_child\_books (book\_id) Gets the child books of the given id.

**Parameters book\_id** (osid.id.Id) – the Id of the Book to query

Returns the child books of the id

Return type osid.commenting.BookList

Raise NotFound - a Book identified by Id is not found

Raise NullArgument - book\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

CommentingManager.is\_descendant\_of\_book (*id\_*, *book\_id*) Tests if an Id is a descendant of a book.

#### **Parameters**

- id (osid.id.Id) an Id
- **book\_id** (osid.id.Id) the Id of a book

Returns true if the id is a descendant of the book\_id, false otherwise

Return type boolean

Raise NotFound - book\_id is not found

**Raise** NullArgument - id or book\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented. implementation notes:* If id is not found return false.

CommentingManager.get\_book\_node\_ids (book\_id, ancestor\_levels, descendant\_levels, include\_siblings)

Gets a portion of the hierarchy for the given book.

### Parameters

- book\_id (osid.id.Id) the Id to query
- **ancestor\_levels** (cardinal) the maximum number of ancestor levels to include. A value of 0 returns no parents in the node.
- **descendant\_levels** (cardinal) the maximum number of descendant levels to include. A value of 0 returns no children in the node.
- include\_siblings (boolean) true to include the siblings of the given node, false to omit the siblings

**Returns** a book node

Return type osid.hierarchy.Node

 $Raise \; \texttt{NotFound-book\_id} \; is \; not \; found$ 

**Raise** NullArgument - book\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

CommentingManager.get\_book\_nodes (book\_id, ancestor\_levels, descendant\_levels, include\_siblings)

Gets a portion of the hierarchy for the given book.

### **Parameters**

- book\_id (osid.id.Id) the Id to query
- **ancestor\_levels** (cardinal) the maximum number of ancestor levels to include. A value of 0 returns no parents in the node.
- **descendant\_levels** (cardinal) the maximum number of descendant levels to include. A value of 0 returns no children in the node.
- **include\_siblings** (boolean) true to include the siblings of the given node, false to omit the siblings

Returns a book node

Return type osid.commenting.BookNode

Raise NotFound - book\_id is not found

**Raise** NullArgument - book\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

### **Book Hierarchy Design Methods**

CommentingManager.book\_hierarchy\_id

Gets the hierarchy  ${\tt Id}$  associated with this session.

**Returns** the hierarchy Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

CommentingManager.book\_hierarchy

Gets the hierarchy associated with this session.

Returns the hierarchy associated with this session

Return type osid.hierarchy.Hierarchy

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

CommentingManager.can\_modify\_book\_hierarchy()

Tests if this user can change the hierarchy.

A return of true does not guarantee successful authorization. A return of false indicates that it is known performing any update will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer these operations to an unauthorized user.

Returns false if changing this hierarchy is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

CommentingManager.add\_root\_book (book\_id) Adds a root book.

Parameters book\_id (osid.id.Id) - the Id of a book

**Raise** AlreadyExists – book\_id is already in hierarchy

**Raise** NotFound – book\_id is not found

Raise NullArgument - book\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

CommentingManager.remove\_root\_book (*book\_id*) Removes a root book.

Parameters book\_id (osid.id.Id) - the Id of a book

**Raise** NotFound – book\_id is not a root

Raise NullArgument - book\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

CommentingManager.**add\_child\_book** (*book\_id*, *child\_id*) Adds a child to a book.

#### **Parameters**

- **book\_id** (osid.id.Id) the Id of a book
- child\_id (osid.id.Id) the Id of the new child

Raise AlreadyExists - book\_id is already a parent of child\_id

Raise NotFound-book\_id or child\_id not found

**Raise** NullArgument - book\_id or child\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

CommentingManager.**remove\_child\_book** (*book\_id*, *child\_id*) Removes a child from a book.

### Parameters

• book\_id (osid.id.Id) - the Id of a book

• child\_id (osid.id.Id) - the Id of the new child

Raise NotFound - book\_id not a parent of child\_id

Raise NullArgument - book\_id or child\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

CommentingManager.remove\_child\_books(*book\_id*) Removes all children from a book.

Parameters book\_id (osid.id.Id) - the Id of a book

Raise NotFound - book\_id not found

Raise NullArgument - book\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

# Book

### Book

class dlkit.services.commenting.Book (provider\_manager, catalog, runtime, proxy, \*\*kwargs)
Bases: dlkit.osid.objects.OsidCatalog, dlkit.osid.sessions.OsidSession

A Book represents a collection of comments.

Like all OSID objects, a Book is identified by its Id and any persisted references should use the Id.

### get\_book\_record(book\_record\_type)

Gets the book record corresponding to the given Book record Type.

This method is used to retrieve an object implementing the requested record. The book\_record\_type may be the Type returned in get\_record\_types () or any of its parents in a Type hierarchy where has\_record\_type (book\_record\_type) is true.

**Parameters book\_record\_type** (osid.type.Type) - the type of book record to retrieve

**Returns** the book record

Return type osid.commenting.records.BookRecord

Raise NullArgument - book\_record\_type is null

Raise OperationFailed - unable to complete request

Raise Unsupported-has\_record\_type (book\_record\_type) is false

compliance: mandatory – This method must be implemented.

### **Comment Lookup Methods**

```
Book.book_id
```

Gets the Book Id associated with this session.

Returns the Book Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

### Book.**book**

Gets the Book associated with this session.

Returns the book

Return type osid.commenting.Book

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Book.can\_lookup\_comments()

Tests if this user can examine this book.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer these operations.

Returns false if book reading methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### Book.use\_comparative\_comment\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory - This method is must be implemented.

#### Book.use\_plenary\_comment\_view()

A complete view of the Comment returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

### Book.use\_federated\_book\_view()

Federates the view for methods in this session.

A federated view will include comments in books which are children of this book in the book hierarchy.

compliance: mandatory – This method is must be implemented.

### Book.use\_isolated\_book\_view()

Isolates the view for methods in this session.

An isolated view restricts searches to this book only.

compliance: mandatory – This method is must be implemented.

### Book.use\_effective\_comment\_view()

Only comments whose effective dates are current are returned by methods in this session.

compliance: mandatory - This method is must be implemented.

#### Book.use\_any\_effective\_comment\_view()

All comments of any effective dates are returned by all methods in this session.

compliance: mandatory – This method is must be implemented.

#### Book.get\_comment(comment\_id)

Gets the Comment specified by its Id.

Parameters comment\_id (osid.id.Id) - the Id of the Comment to retrieve

Returns the returned Comment

Return type osid.commenting.Comment

Raise NotFound - no Comment found with the given Id

**Raise** NullArgument - comment\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

#### Book.get\_comments\_by\_ids(comment\_ids)

Gets a CommentList corresponding to the given IdList.

Parameters comment\_ids (osid.id.IdList) - the list of Ids to retrieve

Returns the returned Comment list

Return type osid.commenting.CommentList

Raise NotFound - an Id was not found

Raise NullArgument - comment\_ids is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Book.get\_comments\_by\_genus\_type (comment\_genus\_type)

Gets a CommentList corresponding to the given comment genus Type which does not include comments of genus types derived from the specified Type.

**Parameters comment\_genus\_type** (osid.type.Type) – a comment genus type

**Returns** the returned Comment list

Return type osid.commenting.CommentList

**Raise** NullArgument - comment\_genus\_type is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Book.get\_comments\_by\_parent\_genus\_type (comment\_genus\_type)

Gets a CommentList corresponding to the given comment genus Type and include any additional comments with genus types derived from the specified Type.

Parameters comment\_genus\_type (osid.type.Type) - a comment genus type

Returns the returned Comment list

Return type osid.commenting.CommentList

Raise NullArgument - comment\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

Book.get\_comments\_by\_record\_type (comment\_record\_type) Gets a CommentList containing the given comment record Type.

**Parameters comment\_record\_type** (osid.type.Type) - a comment record type

**Returns** the returned Comment list

Return type osid.commenting.CommentList

**Raise** NullArgument - comment\_record\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

#### Book.get\_comments\_on\_date(from\_, to)

Gets a CommentList effective during the entire given date range inclusive but not confined to the date range.

#### Parameters

- from (osid.calendaring.DateTime) starting date
- to (osid.calendaring.DateTime) ending date

Returns the returned Comment list

Return type osid.commenting.CommentList

**Raise** InvalidArgument – from is greater than to

Raise NullArgument - from or to is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Book.get\_comments\_by\_genus\_type\_on\_date (comment\_genus\_type, from\_, to)

Gets a CommentList of a given genus type and effective during the entire given date range inclusive but not confined to the date range.

### **Parameters**

- comment\_genus\_type (osid.type.Type) a comment genus type
- from (osid.calendaring.DateTime) starting date
- to (osid.calendaring.DateTime) ending date

**Returns** the returned Comment list

Return type osid.commenting.CommentList

**Raise** InvalidArgument – from is greater than to

**Raise** NullArgument - comment\_genus\_type, from, or to is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

```
Book.get_comments_for_commentor (resource_id)
Gets a list of comments corresponding to a resource Id.
```

Parameters resource\_id (osid.id.Id) - the Id of the resource

Returns the returned CommentList

Return type osid.commenting.CommentList

Raise NullArgument - resource\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

### Book.get\_comments\_for\_commentor\_on\_date(resource\_id, from\_, to)

Gets a list of all comments corresponding to a resource Id and effective during the entire given date range inclusive but not confined to the date range.

### **Parameters**

- resource\_id (osid.id.Id) the Id of the resource
- from (osid.calendaring.DateTime) from date
- to (osid.calendaring.DateTime) to date

Returns the returned CommentList

Return type osid.commenting.CommentList

Raise InvalidArgument - to is less than from

**Raise** NullArgument - resource\_id, from, or to is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

### Book.get\_comments\_by\_genus\_type\_for\_commentor(resource\_id,

com-

*ment\_genus\_type*) Gets a list of comments of the given genus type corresponding to a resource Id.

### Parameters

- resource\_id (osid.id.Id) the Id of the resource
- comment\_genus\_type (osid.type.Type) the comment genus type

Returns the returned CommentList

Return type osid.commenting.CommentList

Raise NullArgument - resource\_id or comment\_genus\_type is null

 $Raise \ {\tt OperationFailed-unable} \ to \ complete \ request$ 

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Book.get\_comments\_by\_genus\_type\_for\_commentor\_on\_date(resource\_id, com-

*ment\_genus\_type*, *from*, *to*)

Gets a list of all comments of the given genus type corresponding to a resource Id and effective during the entire given date range inclusive but not confined to the date range.

## Parameters

- resource\_id (osid.id.Id) the Id of the resource
- comment\_genus\_type (osid.type.Type) the comment genus type
- from (osid.calendaring.DateTime) from date
- to (osid.calendaring.DateTime) to date

Returns the returned CommentList

Return type osid.commenting.CommentList

**Raise** InvalidArgument - to is less than from

Raise NullArgument - resource\_id, comment\_genus\_type, from, or to is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# Book.get\_comments\_for\_reference (reference\_id)

Gets a list of comments corresponding to a reference Id.

Parameters reference\_id (osid.id.Id) - the Id of the reference

Returns the returned CommentList

Return type osid.commenting.CommentList

**Raise** NullArgument - reference\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Book.get\_comments\_for\_reference\_on\_date (reference\_id, from\_, to)

Gets a list of all comments corresponding to a reference Id and effective during the entire given date range inclusive but not confined to the date range.

#### **Parameters**

- reference\_id (osid.id.Id) a reference Id
- from (osid.calendaring.DateTime) from date
- to (osid.calendaring.DateTime) to date

Returns the returned CommentList

Return type osid.commenting.CommentList

Raise InvalidArgument - to is less than from

Raise NullArgument - reference\_id, from, or to is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Book.get\_comments\_by\_genus\_type\_for\_reference (reference\_id,

com-

*ment genus type*)

Gets a list of comments of the given genus type corresponding to a reference Id.

**Parameters** 

- reference\_id (osid.id.Id) the Id of the reference
- comment\_genus\_type (osid.type.Type) the comment genus type

Returns the returned CommentList

Return type osid.commenting.CommentList

**Raise** NullArgument - reference\_id or comment\_genus\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Book.get\_comments\_by\_genus\_type\_for\_reference\_on\_date (reference\_id,

com-

*ment\_genus\_type*, *from\_*, *to*)

Gets a list of all comments of the given genus type corresponding to a reference Id and effective during the entire given date range inclusive but not confined to the date range.

#### **Parameters**

- reference\_id (osid.id.Id) a reference Id
- comment\_genus\_type (osid.type.Type) the comment genus type
- from (osid.calendaring.DateTime) from date
- to (osid.calendaring.DateTime) to date

Returns the returned CommentList

Return type osid.commenting.CommentList

**Raise** InvalidArgument - to is less than from

Raise NullArgument - reference\_id, comment\_genus\_type, from, or to is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented.* 

Book.get\_comments\_for\_commentor\_and\_reference (*resource\_id*, *reference\_id*) Gets a list of comments corresponding to a resource and reference Id.

**Parameters** 

- resource\_id (osid.id.Id) the Id of the resource
- reference\_id (osid.id.Id) the Id of the reference

Returns the returned CommentList

Return type osid.commenting.CommentList

**Raise** NullArgument - resource\_id or reference\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

```
Book.get comments for commentor and reference on date (resource id, ref-
                                                              erence_id, from_,
```

to)

Gets a list of all comments corresponding to a resource and reference Id and effective during the entire given date range inclusive but not confined to the date range.

### **Parameters**

- resource\_id (osid.id.Id) the Id of the resource
- reference\_id (osid.id.Id) a reference Id
- from (osid.calendaring.DateTime) from date
- to (osid.calendaring.DateTime) to date

Returns the returned CommentList

Return type osid.commenting.CommentList

**Raise** InvalidArgument - to is less than from

Raise NullArgument-resource\_id, reference\_id, from, or to is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Book.get\_comments\_by\_genus\_type\_for\_commentor\_and\_reference (resource\_id,

reference\_id,

com-

ment\_genus\_type)

Gets a list of comments of the given genus type corresponding to a resource and reference Id.

#### **Parameters**

- resource\_id (osid.id.Id) the Id of the resource
- reference\_id (osid.id.Id) the Id of the reference
- comment genus type (osid.type.Type) the comment genus type

**Returns** the returned CommentList

Return type osid.commenting.CommentList

Raise NullArgument resource\_id, reference\_id \_ or comment\_genus\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

### Book.get\_comments\_by\_genus\_type\_for\_commentor\_and\_reference\_on\_date(resource\_id,

refence\_id, comment genus type, from\_,

er-

Gets a list of all comments corresponding to a resource and reference Id and effective during the

entire given date range inclusive but not confined to the date range.

#### **Parameters**

- **resource\_id** (osid.id.Id) the Id of the resource
- reference\_id (osid.id.Id) a reference Id
- comment\_genus\_type (osid.type.Type) the comment genus type
- from (osid.calendaring.DateTime) from date
- to (osid.calendaring.DateTime) to date

Returns the returned CommentList

Return type osid.commenting.CommentList

Raise InvalidArgument - to is less than from

Raise NullArgument - resource\_id, reference\_id, comment\_genus\_type, from, or to is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

### Book.comments

Gets all comments.

**Returns** a list of comments

Return type osid.commenting.CommentList

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### **Comment Query Methods**

Book.book\_id

Gets the Book Id associated with this session.

Returns the Book Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

### Book.book

Gets the Book associated with this session.

Returns the book

Return type osid.commenting.Book

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

#### Book.can\_search\_comments()

Tests if this user can perform comment searches.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer search operations to unauthorized users.

Returns false if search methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# Book.use\_federated\_book\_view()

Federates the view for methods in this session.

A federated view will include comments in books which are children of this book in the book hierarchy.

compliance: mandatory – This method is must be implemented.

### Book.use\_isolated\_book\_view()

Isolates the view for methods in this session.

An isolated view restricts searches to this book only.

compliance: mandatory – This method is must be implemented.

### Book.comment\_query

Gets a comment query.

Returns the comment query

Return type osid.commenting.CommentQuery

compliance: mandatory – This method must be implemented.

### Book .get\_comments\_by\_query (*comment\_query*) Gets a list of comments matching the given search.

Parameters comment\_query (osid.commenting.CommentQuery) - the search
 query array

Returns the returned CommentList

Return type osid.commenting.CommentList

Raise NullArgument - comment\_query is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported - comment\_query is not of this service

compliance: mandatory – This method must be implemented.

### **Comment Admin Methods**

```
Book.book_id
```

Gets the Book Id associated with this session.

Returns the Book Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### Book.**book**

Gets the Book associated with this session.

**Returns** the book

Return type osid.commenting.Book

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

### Book.can\_create\_comments()

Tests if this user can create comments.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating a Comment will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer create operations to unauthorized users.

Returns false if Comment creation is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
Book.can_create_comment_with_record_types (comment_record_types)
```

Tests if this user can create a single Comment using the desired record types.

While CommentingManager.getCommentRecordTypes() can be used to examine which records are supported, this method tests which record(s) are required for creating a specific Comment. Providing an empty array tests if a Comment can be created with no records.

Parameters comment\_record\_types (osid.type.Type[]) - array of comment record types

**Returns** true if Comment creation using the specified record Types is supported, false otherwise

Return type boolean

**Raise** NullArgument - comment\_record\_types is null

compliance: mandatory – This method must be implemented.

Book.get\_comment\_form\_for\_create (*reference\_id*, *comment\_record\_types*) Gets the comment form for creating new comments.

A new form should be requested for each create transaction.

### Parameters

- reference\_id (osid.id.Id) the Id for the reference object
- comment\_record\_types (osid.type.Type[]) array of comment record types

**Returns** the comment form

Return type osid.commenting.CommentForm

Raise NullArgument-reference\_id or comment\_record\_types is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

**Raise** Unsupported – unable to get form for requested record types

compliance: mandatory – This method must be implemented.

#### Book.create\_comment(comment\_form)

Creates a new Comment.

Parameters comment\_form (osid.commenting.CommentForm) - the form for this Comment

Returns the new Comment

Return type osid.commenting.Comment

**Raise** IllegalState - comment\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

**Raise** NullArgument - comment\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported - comment\_form did not originate from
 get\_comment\_form\_for\_create()

compliance: mandatory – This method must be implemented.

### Book.can\_update\_comments()

Tests if this user can update comments.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating a Comment will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer update operations to unauthorized users.

Returns false if Comment modification is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
Book.get_comment_form_for_update(comment_id)
```

Gets the comment form for updating an existing comment.

A new comment form should be requested for each update transaction.

Parameters comment\_id (osid.id.Id) - the Id of the Comment

Returns the comment form

Return type osid.commenting.CommentForm

**Raise** NotFound - comment\_id is not found

Raise NullArgument - comment\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

### Book.update\_comment(comment\_form)

Updates an existing comment.

```
Parameters comment_form (osid.commenting.CommentForm) - the form con-
taining the elements to be updated
```

**Raise** IllegalState - comment\_form already used in an update transaction

Raise InvalidArgument - the form contains an invalid value

Raise NullArgument - comment\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

**Raise** Unsupported - comment\_form did not originate from get\_comment\_form\_for\_update()

compliance: mandatory – This method must be implemented.

### Book.can\_delete\_comments()

Tests if this user can delete comments.

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting an Comment will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer delete operations to unauthorized users.

Returns false if Comment deletion is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### Book.delete\_comment(comment\_id)

Deletes a Comment.

Parameters comment\_id (osid.id.Id) - the Id of the Comment to remove

**Raise** NotFound - comment\_id not found

Raise NullArgument - comment\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Book.can\_manage\_comment\_aliases()

Tests if this user can manage Id aliases for Comnents.

A return of true does not guarantee successful authorization. A return of false indicates that it is known changing an alias will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer alias operations to an unauthorized user.

**Returns** false if Comment aliasing is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
Book.alias_comment (comment_id, alias_id)
```

Adds an Id to a Comment for the purpose of creating compatibility.

The primary Id of the Comment is determined by the provider. The new Id performs as an alias to the primary Id. If the alias is a pointer to another comment, it is reassigned to the given comment Id.

#### Parameters

- comment\_id (osid.id.Id) the Id of a Comment
- alias\_id (osid.id.Id) the alias Id

Raise AlreadyExists - alias\_id is already assigned
Raise NotFound - comment\_id not found
Raise NullArgument - comment\_id or alias\_id is null
Raise OperationFailed - unable to complete request
Raise PermissionDenied - authorization failure
compliance: mandatory - This method must be implemented.

# **Objects**

### Comment

```
class dlkit.commenting.objects.Comment
Bases: dlkit.osid.objects.OsidRelationship
```

A Comment represents a comment and/or rating related to a reference object in a book.

#### reference\_id

Gets the Id of the referenced object to which this comment pertains.

Returns the reference  ${\tt Id}$ 

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### commentor\_id

Gets the Id of the resource who created this comment.

Returns the Resource Id

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### commentor

Gets the resource who created this comment.

Returns the Resource

Return type osid.resource.Resource

Raise OperationFailed - unable to complete request

*compliance: mandatory – This method must be implemented.* 

#### commenting\_agent\_id

Gets the Id of the agent who created this comment.

Returns the Agent Id

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### commenting\_agent

Gets the agent who created this comment.

Returns the Agent

Return type osid.authentication.Agent

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

### text

Gets the comment text.

**Returns** the comment text

Return type osid.locale.DisplayText

compliance: mandatory – This method must be implemented.

### has\_rating()

Tests if this comment includes a rating.

**Returns** true if this comment includes a rating, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### rating\_id

Gets the Id of the Grade.

Returns the Agent Id

Return type osid.id.Id

**Raise** IllegalState - has\_rating() is false

compliance: mandatory – This method must be implemented.

### rating

Gets the Grade.

Returns the Grade

Return type osid.grading.Grade

**Raise** IllegalState - has\_rating() is false

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

#### get\_comment\_record (comment\_record\_type)

Gets the comment record corresponding to the given Comment record Type.

This method is used to retrieve an object implementing the requested record. The comment\_record\_type may be the Type returned in get\_record\_types() or any of its parents in a Type hierarchy where has\_record\_type(comment\_record\_type) is true.

Parameters comment\_record\_type (osid.type.Type) - the type of comment record to retrieve

Returns the comment record

Return type osid.commenting.records.CommentRecord

**Raise** NullArgument - comment\_record\_type is null

Raise OperationFailed - unable to complete request

Raise Unsupported - has\_record\_type (comment\_record\_type) is false

# **Comment Form**

class dlkit.commenting.objects.CommentForm

Bases: dlkit.osid.objects.OsidRelationshipForm

This is the form for creating and updating Comment objects.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the CommentAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

# text\_metadata

Gets the metadata for the text.

Returns metadata for the text

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

#### text

#### rating\_metadata

Gets the metadata for a rating.

**Returns** metadata for the rating

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

### rating

### get\_comment\_form\_record (comment\_record\_type)

Gets the CommentFormRecord corresponding to the given comment record Type.

Parameters comment\_record\_type (osid.type.Type) - the comment record type

**Returns** the comment form record

Return type osid.commenting.records.CommentFormRecord

**Raise** NullArgument - comment\_record\_type is null

Raise OperationFailed - unable to complete request

Raise Unsupported - has\_record\_type (comment\_record\_type) is false

compliance: mandatory – This method must be implemented.

### **Comment List**

class dlkit.commenting.objects.CommentList

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, CommentList provides a means for accessing Comment elements sequentially either one at a time or many at a time.

Examples: while (cl.hasNext()) { Comment comment = cl.getNextComment(); }

or

while (cl.hasNext()) { Comment[] comments = cl.getNextComments(cl.available());

}

### next\_comment

Gets the next Comment in this list.

**Returns** the next Comment in this list. The has\_next() method should be used to test that a next Comment is available before calling this method.

Return type osid.commenting.Comment

Raise IllegalState - no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

#### get\_next\_comments (n)

Gets the next set of Comment elements in this list.

The specified amount must be less than or equal to the return from available().

- Parameters n (cardinal) the number of Comment elements requested which must be less
  than or equal to available()
- **Returns** an array of Comment elements. The length of the array is less than or equal to the number specified.

Return type osid.commenting.Comment

Raise IllegalState - no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

### Book

class dlkit.commenting.objects.Book (abc\_commenting\_objects.Book, osid\_objects.OsidCatalog)
:noindex:

#### get\_book\_record(book\_record\_type)

Gets the book record corresponding to the given Book record Type.

This method is used to retrieve an object implementing the requested record. The book\_record\_type may be the Type returned in get\_record\_types () or any of its parents in a Type hierarchy where has\_record\_type (book\_record\_type) is true.

Parameters book\_record\_type (osid.type.Type) - the type of book record to retrieve

Returns the book record

Return type osid.commenting.records.BookRecord

Raise NullArgument - book\_record\_type is null

 $Raise \ {\tt OperationFailed-unable to \ complete \ request}$ 

Raise Unsupported - has\_record\_type (book\_record\_type) is false

# **Book Form**

```
class dlkit.commenting.objects.BookForm
    Bases: dlkit.osid.objects.OsidCatalogForm
```

This is the form for creating and updating Books.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the BookAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

get\_book\_form\_record (book\_record\_type)
Gets the BookFormRecord corresponding to the given book record Type.

**Parameters book\_record\_type** (osid.type.Type) - the book record type

Returns the book form record

Return type osid.commenting.records.BookFormRecord

**Raise** NullArgument - book\_record\_type is null

Raise OperationFailed - unable to complete request

Raise Unsupported-has\_record\_type (book\_record\_type) is false

compliance: mandatory – This method must be implemented.

### **Book List**

```
class dlkit.commenting.objects.BookList
```

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, BookList provides a means for accessing Book elements sequentially either one at a time or many at a time.

Examples: while (bl.hasNext()) { Book book = bl.getNextBook(); }

#### or

while (bl.hasNext()) { Book[] books = bl.getNextBooks(bl.available());

}

### next\_book

Gets the next Book in this list.

**Returns** the next Book in this list. The has\_next () method should be used to test that a next Book is available before calling this method.

Return type osid.commenting.Book

**Raise** IllegalState – no more elements available in this list

 $Raise \ {\tt OperationFailed-unable to \ complete \ request}$ 

compliance: mandatory – This method must be implemented.

#### get\_next\_books(n)

Gets the next set of Book elements in this list.

The specified amount must be less than or equal to the return from available().

**Parameters n** (cardinal) – the number of Book elements requested which must be less than or equal to available ()

**Returns** an array of Book elements. The length of the array is less than or equal to the number specified.

Return type osid.commenting.Book

**Raise** IllegalState – no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

### **Book Node**

 $class \, \texttt{dlkit.commenting.objects.BookNode}$ 

Bases: dlkit.osid.objects.OsidNode

This interface is a container for a partial hierarchy retrieval.

The number of hierarchy levels traversable through this interface depend on the number of levels requested in the BookHierarchySession.

#### book

Gets the Book at this node.

**Returns** the book represented by this node

**Return type** osid.commenting.Book

compliance: mandatory – This method must be implemented.

### parent\_book\_nodes

Gets the parents of this book.

**Returns** the parents of this book

Return type osid.commenting.BookNodeList

compliance: mandatory – This method must be implemented.

### child\_book\_nodes

Gets the children of this book.

Returns the children of this book

Return type osid.commenting.BookNodeList

compliance: mandatory – This method must be implemented.

# **Book Node List**

class dlkit.commenting.objects.BookNodeList

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, BookNodeList provides a means for accessing BookNode elements sequentially either one at a time or many at a time.

Examples: while (bnl.hasNext()) { BookNode node = bnl.getNextBookNode(); }

or

while (bnl.hasNext()) { BookNode[] nodes = bnl.getNextBookNodes(bnl.available());

}

#### next\_book\_node

Gets the next BookNode in this list.

**Returns** the next BookNode in this list. The has\_next() method should be used to test that a next BookNode is available before calling this method.

Return type osid.commenting.BookNode

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

#### get\_next\_book\_nodes (n)

Gets the next set of BookNode elements in this list.

The specified amount must be less than or equal to the return from available().

- **Parameters n** (cardinal) the number of BookNode elements requested which must be less than or equal to available()
- **Returns** an array of BookNode elements. The length of the array is less than or equal to the number specified.

Return type osid.commenting.BookNode

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

# Queries

### **Comment Query**

class dlkit.commenting.queries.CommentQuery

Bases: dlkit.osid.queries.OsidRelationshipQuery

This is the query for searching comments.

Each method specifies an AND term while multiple invocations of the same method produce a nested OR.

### match\_reference\_id (source\_id, match)

Sets reference Id.

#### **Parameters**

- source\_id (osid.id.Id) a source Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - source\_id is null

compliance: mandatory – This method must be implemented.

#### reference\_id\_terms

match\_commentor\_id (resource\_id, match)
Sets a resource Id to match a commentor.

#### **Parameters**

• resource\_id (osid.id.Id) - a resource Id

• match (boolean) - true for a positive match, false for a negative match

**Raise** NullArgument - resource\_id is null

compliance: mandatory – This method must be implemented.

### commentor\_id\_terms

#### supports\_commentor\_query()

Tests if a ResourceQuery is available.

**Returns** true if a resource query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### commentor\_query

Gets the query for a resource query.

Multiple retrievals produce a nested OR term.

Returns the resource query

Return type osid.resource.ResourceQuery

Raise Unimplemented - supports\_commentor\_query() is false

compliance: optional – This method must be implemented if "supports\_commentor\_query()" is "true".

### commentor\_terms

#### match\_commenting\_agent\_id(agent\_id, match)

Sets an agent Id.

### Parameters

- agent\_id (osid.id.Id) an agent Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - agent\_id is null

compliance: mandatory – This method must be implemented.

### commenting\_agent\_id\_terms

### supports\_commenting\_agent\_query()

Tests if an AgentQuery is available.

Returns true if an agent query is available, false otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

#### commenting\_agent\_query

Gets the query for an agent query.

Multiple retrievals produce a nested OR term.

**Returns** the agent query

Return type osid.authentication.AgentQuery

Raise Unimplemented-supports\_commenting\_agent\_query() is false

compliance: optional – This method must be implemented if ''supports\_commenting\_agent\_query()'' is ''true''.

#### commenting\_agent\_terms

match\_text (text, string\_match\_type, match)

# Parameters

Matches text.

- text (string) the text
- string\_match\_type (osid.type.Type) a string match type
- match (boolean) true for a positive match, false for a negative match

Raise InvalidArgument - text is not of string\_match\_type

Raise NullArgument - text is null

```
Raise Unsupported - supports_string_match_type(string_match_type) is
false
```

compliance: mandatory – This method must be implemented.

#### match\_any\_text (match)

Matches a comment that has any text assigned.

**Parameters match** (boolean) – true to match comments with any text, false to match comments with no text

compliance: mandatory – This method must be implemented.

#### text\_terms

match\_rating\_id(grade\_id, match)

Sets a grade Id.

### **Parameters**

- grade\_id (osid.id.Id) a grade Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - grade\_id is null

compliance: mandatory – This method must be implemented.

### rating\_id\_terms

#### supports\_rating\_query()

Tests if a GradeQuery is available.

**Returns** true if a rating query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### rating\_query

Gets the query for a rating query.

Multiple retrievals produce a nested OR term.

**Returns** the rating query

Return type osid.grading.GradeQuery

Raise Unimplemented - supports\_rating\_query() is false

compliance: optional – This method must be implemented if ''supports\_rating\_query()'' is ''true''.

match\_any\_rating (match)
Matches books with any rating.

**Parameters match** (boolean) - true to match comments with any rating, false to match comments with no ratings

compliance: mandatory – This method must be implemented.

### rating\_terms

match\_book\_id(book\_id, match)

Sets the book Id for this query to match comments assigned to books.

**Parameters** 

• book\_id (osid.id.Id) - a book Id

• match (boolean) - true for a positive match, false for a negative match

**Raise** NullArgument - book\_id is null

compliance: mandatory – This method must be implemented.

#### book\_id\_terms

supports\_book\_query()

Tests if a BookQuery is available.

**Returns** true if a book query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### book\_query

Gets the query for a book query.

Multiple retrievals produce a nested OR term.

Returns the book query

Return type osid.commenting.BookQuery

Raise Unimplemented - supports\_book\_query() is false

compliance: optional – This method must be implemented if ''supports\_book\_query()'' is ''true''.

#### book\_terms

get\_comment\_query\_record (comment\_record\_type)

Gets the comment query record corresponding to the given Comment record Type.

Multiple record retrievals produce a nested OR term.

Parameters comment\_record\_type (osid.type.Type) - a comment record type

**Returns** the comment query record

Return type osid.commenting.records.CommentQueryRecord

**Raise** NullArgument - comment\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type (comment\_record\_type) is false

### **Book Query**

```
class dlkit.commenting.queries.BookQuery
```

Bases: dlkit.osid.queries.OsidCatalogQuery

This is the query for searching books.

Each method specifies an AND term while multiple invocations of the same method produce a nested OR.

### match\_comment\_id (comment\_id, match)

Sets the comment Id for this query to match comments assigned to books.

### **Parameters**

- comment\_id (osid.id.Id) a comment Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - comment\_id is null

compliance: mandatory – This method must be implemented.

### comment\_id\_terms

### supports\_comment\_query()

Tests if a comment query is available.

**Returns** true if a comment query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### comment\_query

Gets the query for a comment.

**Returns** the comment query

**Return type** osid.commenting.CommentQuery

Raise Unimplemented - supports\_comment\_query() is false

compliance: optional – This method must be implemented if "supports\_comment\_query()" is "true".

### match\_any\_comment (match)

Matches books with any comment.

**Parameters match** (boolean) – true to match books with any comment, false to match books with no comments

compliance: mandatory – This method must be implemented.

### comment\_terms

match\_ancestor\_book\_id(book\_id, match)

Sets the book Id for this query to match books that have the specified book as an ancestor.

Parameters

- book\_id (osid.id.Id) a book Id
- match (boolean) true for a positive match, a false for a negative match

**Raise** NullArgument - book\_id is null

compliance: mandatory – This method must be implemented.

ancestor\_book\_id\_terms

### supports\_ancestor\_book\_query()

Tests if a BookQuery is available.

**Returns** true if a book query is available, false otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

# ancestor\_book\_query

Gets the query for a book.

Multiple retrievals produce a nested OR term.

**Returns** the book query

Return type osid.commenting.BookQuery

Raise Unimplemented - supports\_ancestor\_book\_query() is false

compliance: optional – This method must be implemented if ''supports\_ancestor\_book\_query()'' is ''true''.

#### match\_any\_ancestor\_book (match)

Matches books with any ancestor.

Parameters match (boolean) - true to match books with any ancestor, false to match
root books

compliance: mandatory – This method must be implemented.

#### ancestor\_book\_terms

#### match\_descendant\_book\_id(book\_id, match)

Sets the book Id for this query to match books that have the specified book as a descendant.

#### **Parameters**

- **book\_id** (osid.id.Id) a book Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - book\_id is null

compliance: mandatory – This method must be implemented.

#### descendant\_book\_id\_terms

supports\_descendant\_book\_query()

Tests if a BookQuery is available.

**Returns** true if a book query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### descendant\_book\_query

Gets the query for a book.

Multiple retrievals produce a nested OR term.

Returns the book query

Return type osid.commenting.BookQuery

Raise Unimplemented - supports\_descendant\_book\_query() is false

compliance: optional – This method must be implemented if ''supports\_descendant\_book\_query()'' is ''true''.

### match\_any\_descendant\_book (match)

Matches books with any descendant.

Parameters match (boolean) - true to match books with any descendant, false to match
 leaf books

compliance: mandatory – This method must be implemented.

### descendant\_book\_terms

#### get\_book\_query\_record (book\_record\_type)

Gets the book query record corresponding to the given Book record Type.

Multiple record retrievals produce a nested boolean OR term.

Parameters book\_record\_type (osid.type.Type) - a book record type

Returns the book query record

Return type osid.commenting.records.BookQueryRecord

**Raise** NullArgument - book\_record\_type is null

Raise OperationFailed - unable to complete request

Raise Unsupported - has\_record\_type (book\_record\_type) is false

compliance: mandatory – This method must be implemented.

# Records

### **Comment Record**

class dlkit.commenting.records.CommentRecord Bases: dlkit.osid.records.OsidRecord

A record for a Comment.

The methods specified by the record type are available through the underlying object.

### **Comment Query Record**

class dlkit.commenting.records.CommentQueryRecord Bases: dlkit.osid.records.OsidRecord

A record for a CommentQuery.

The methods specified by the record type are available through the underlying object.

# **Comment Form Record**

class dlkit.commenting.records.CommentFormRecord Bases: dlkit.osid.records.OsidRecord

A record for a CommentForm.

The methods specified by the record type are available through the underlying object.

# **Comment Search Record**

class dlkit.commenting.records.CommentSearchRecord Bases: dlkit.osid.records.OsidRecord

A record for a  ${\tt CommentSearch}.$ 

The methods specified by the record type are available through the underlying object.

## **Book Record**

class dlkit.commenting.records.BookRecord Bases: dlkit.osid.records.OsidRecord

A record for a Book.

The methods specified by the record type are available through the underlying object.

### **Book Query Record**

```
class dlkit.commenting.records.BookQueryRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for a BookQuery.

The methods specified by the record type are available through the underlying object.

# **Book Form Record**

class dlkit.commenting.records.BookFormRecord Bases: dlkit.osid.records.OsidRecord

A record for a BookForm.

The methods specified by the record type are available through the underlying object.

# **Book Search Record**

class dlkit.commenting.records.BookSearchRecord Bases: dlkit.osid.records.OsidRecord

A record for a BookSearch.

The methods specified by the record type are available through the underlying object.

# Grading

# Summary

Grading Open Service Interface Definitions grading version 3.0.0

The Grading OSID defines a service to apply grades or ratings.

Grade Systems

The grade system sessions provide the means to retrieve and manage GradeSystem definitions. A GradeSystem is a fixed set of Grades. GradeSystems may also take the form of a numerical score as well as a rating based on some system. GradeEntries belong to a single GradebookColumn.

### Gradebook Columns

A Gradebook is represented by a series of GradebookColumns. A GradeBookColumn represents a something to be graded and is joined to a single GradeSystem. A GradebookColumn may be constrained to a single grader.

### Grade Entries

A GradebookColumn is comprised of a series of GradeEntry elements. A GradebookColumn may represent "Assignment 3" while a GradeEntry may represent the assignment turned in by a particular student.

A Grade can be applied to a GradeEntry that relates the entry to a grader and a key Resource. In the case of a class gradebook, the key resource represents the student. If there are multiple graders for the same key resource, each grader gets their own GradebookColumn.

Gradebooks may also be used to capture ratings about other objects. In the case where people vote for their favorite assets, the key resource represents the Asset.

GradebookColumns may have a GradebookColumnSummary entry for summary results and statistics across all GradeEntries in the column.

### Gradebook Cataloging

GradebookColumns are organized into Gradebooks. Gradebooks also provide for a federated hierarchy of GradebookColumns. Simple reordering of GradebookColumns can be performed by moving the GradebookColumn relative to another. The relative positioning may reference two GradebookColumns through the federation.

### Sub Packages

The Grading OSID includes several subpackages. The Grading Transform OSID provides a means of translating one GradeSystem to another. The Grading Calculation OSID defines derived GradebookColumns. The Grading Batch OSID manages GradeSystems, GradeEntries, Gradebooks, and GradebookColumns in bulk. Grading Open Service Interface Definitions grading version 3.0.0

The Grading OSID defines a service to apply grades or ratings.

### Grade Systems

The grade system sessions provide the means to retrieve and manage GradeSystem definitions. A GradeSystem is a fixed set of Grades. GradeSystems may also take the form of a numerical score as well as a rating based on some system. GradeEntries belong to a single GradebookColumn.

### Gradebook Columns

A Gradebook is represented by a series of GradebookColumns. A GradeBookColumn represents a something to be graded and is joined to a single GradeSystem. A GradebookColumn may be constrained to a single grader.

### Grade Entries

A GradebookColumn is comprised of a series of GradeEntry elements. A GradebookColumn may represent "Assignment 3" while a GradeEntry may represent the assignment turned in by a particular student.

A Grade can be applied to a GradeEntry that relates the entry to a grader and a key Resource. In the case of a class gradebook, the key resource represents the student. If there are multiple graders for the same key resource, each grader gets their own GradebookColumn.

Gradebooks may also be used to capture ratings about other objects. In the case where people vote for their favorite assets, the key resource represents the Asset.

GradebookColumns may have a GradebookColumnSummary entry for summary results and statistics across all GradeEntries in the column.

### Gradebook Cataloging

GradebookColumns are organized into Gradebooks. Gradebooks also provide for a federated hierarchy of GradebookColumns. Simple reordering of GradebookColumns can be performed by moving the GradebookColumn relative to another. The relative positioning may reference two GradebookColumns through the federation.

## Sub Packages

The Grading OSID includes several subpackages. The Grading Transform OSID provides a means of translating one GradeSystem to another. The Grading Calculation OSID defines derived GradebookColumns. The Grading Batch OSID manages GradeSystems, GradeEntries, Gradebooks, and GradebookColumns in bulk.

# **Service Managers**

## **Grading Profile**

```
class dlkit.services.grading.GradingProfile
```

Bases: dlkit.osid.managers.OsidProfile

The GradingProfile describes the interoperability among grading services.

### supports\_grade\_system\_lookup()

Tests if a grade system lookup service is supported.

Returns true if grade system lookup is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_grade\_system\_query()

Tests if a grade system query service is supported.

**Returns** true if grade system query is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_grade\_system\_admin()

Tests if a grade system administrative service is supported.

Returns true if grade system admin is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_grade\_entry\_lookup()

Tests if a grade entry lookup service is supported.

Returns true if grade entry lookup is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_grade\_entry\_query()

Tests if a grade entry query service is supported.

Returns true if grade entry query is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_grade\_entry\_admin()

Tests if a grade entry administrative service is supported.

**Returns** true if grade entry admin is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_gradebook\_column\_lookup()

Tests if a gradebook column lookup service is supported.

Returns true if gradebook column lookup is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_gradebook\_column\_query()

Tests if a gradebook column query service is supported.

Returns true if grade system query is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_gradebook\_column\_admin()

Tests if a gradebook column administrative service is supported.

**Returns** true if gradebook column admin is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_gradebook\_lookup()

Tests if a gradebook lookup service is supported.

Returns true if gradebook lookup is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_gradebook\_admin()

Tests if a gradebook administrative service is supported.

**Returns** true if gradebook admin is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### grade\_record\_types

Gets the supported Grade record types.

Returns a list containing the supported Grade record types

Return type osid.type.TypeList

#### grade\_system\_record\_types

Gets the supported GradeSystem record types.

**Returns** a list containing the supported GradeSystem record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### grade\_system\_search\_record\_types

Gets the supported GradeSystem search record types.

**Returns** a list containing the supported GradeSystem search record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### grade\_entry\_record\_types

Gets the supported GradeEntry record types.

**Returns** a list containing the supported GradeEntry record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

### grade\_entry\_search\_record\_types

Gets the supported GradeEntry search record types.

**Returns** a list containing the supported GradeEntry search record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

### gradebook\_column\_record\_types

Gets the supported GradebookColumn record types.

Returns a list containing the supported GradebookColumn record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### gradebook\_column\_search\_record\_types

Gets the supported gradebook column search record types.

Returns a list containing the supported GradebookColumn search record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### gradebook\_column\_summary\_record\_types

Gets the supported GradebookColumnSummary record types.

**Returns** a list containing the supported GradebookColumnSummary record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### gradebook\_record\_types

Gets the supported Gradebook record types.

Returns a list containing the supported Gradebook record types

**Return type** osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### gradebook\_search\_record\_types

Gets the supported gradebook search record types.

Returns a list containing the supported Gradebook search record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

### **Grading Manager**

class dlkit.services.grading.GradingManager(proxy=None)

Bases: dlkit.osid.managers.OsidManager, dlkit.osid.sessions.OsidSession, dlkit.services.grading.GradingProfile

The grading manager provides access to grading sessions and provides interoperability tests for various aspects of this service.

The sessions included in this manager are:

•GradeSystemLookupSession: a session to look up grades and grade systems

•GradeSystemQuerySession: a session to query grade systems None

•GradeSystemSearchSession: a session to search grade systems

•GradeSystemAdminSession: a session to manage grade systems

•GradeSystemNotificationSession a session for subscribing to new or deleted grades or grade systems

•GradeSystemGradebookSession: a session for retrieving grade system to gradebook mappings

•GradeSystemGradebookAssignmentSession: a session for managing grade system to gradebook mappings

•GradeSystemSmartGradebookSession: a session for managing smart gradebooks of grade systems

•GradeEntryLookupSession: a session to look up grade entries

•GradeEntryQuerySession: a session to query grade entries None

•GradeEntrySearchSession: a session to search grade entries

•GradeEntryAdminSession: a session to create, modify and delete grade entries None

- •GradeEntryNotificationSession: a session to receive messages pertaining to grade entry "" changes
- •GradebookColumnLookupSession: a session to look up gradebook columns
- •GradebookColumnQuerySession: a session to query gradebook columns None
- •GradebookColumnSearchSession: a session to search gradebook columns

•GradebookColumnAdminSession: a session to manage gradebook columns

•GradebookColumnNotificationSession a session for subscribing to new or deleted gradebook columns

•GradebookColumnGradebookSession: a session for retrieving gradebook column to gradebook mappings

•GradebookColumnGradebookAssignmentSession: a session for managing gradebook column to gradebook mappings

•GradebookColumnSmartGradebookSession: a session for managing smart gradebooks of gradebook columns

•GradebookLookupSession: a session to lookup gradebooks

•GradebookQuerySession: a session to query gradebooks

•GradebookSearchSession: a session to search gradebooks

•GradebookAdminSession: a session to create, modify and delete gradebooks

•GradebookNotificationSession: a session to receive messages pertaining to gradebook changes

•GradebookHierarchySession: a session to traverse the gradebook hierarchy

•GradebookHierarchyDesignSession: a session to manage the gradebook hierarchy

### grading\_batch\_manager

Gets the GradingBatchManager.

**Returns** a GradingBatchManager

Return type osid.grading.batch.GradingBatchManager

Raise OperationFailed - unable to complete request

Raise Unimplemented - supports\_grading\_batch() is false

compliance: optional – This method must be implemented if ''supports\_grading\_batch()'' is true.

#### grading\_calculation\_manager

Gets the GradingCalculationManager.

Returns a GradingCalculationManager

Return type osid.grading.calculation.GradingCalculationManager

Raise OperationFailed - unable to complete request

**Raise** Unimplemented - supports\_grading\_calculation() is false

compliance: optional – This method must be implemented if "supports\_grading\_calculation()" is true.

#### grading\_transform\_manager

Gets the GradingTransformManager.

Returns a GradingTransformManager

Return type osid.grading.transform.GradingTransformManager

Raise OperationFailed - unable to complete request

**Raise** Unimplemented - supports\_grading\_transform() is false

compliance: optional – This method must be implemented if ''supports\_grading\_transform()'' is true.

### Gradebook Column Lookup Methods

GradingManager.gradebook\_id

Gets the Gradebook Id associated with this session.

Returns the Gradebook Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

GradingManager.gradebook

Gets the Gradebook associated with this session.

Returns the Gradebook associated with this session

**Return type** osid.grading.Gradebook

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

GradingManager.can\_lookup\_gradebook\_columns()

Tests if this user can perform GradebookColumn lookups.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

Returns false if lookup methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# GradingManager.use\_comparative\_gradebook\_column\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

GradingManager.use\_plenary\_gradebook\_column\_view()

A complete view of the GradebookColumn returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

# GradingManager.use\_federated\_gradebook\_view()

Federates the view for methods in this session.

A federated view will include gradebook columns in gradebooks which are children of this gradebook in the gradebook hierarchy.

compliance: mandatory – This method is must be implemented.

GradingManager.use\_isolated\_gradebook\_view() Isolates the view for methods in this session.

An isolated view restricts searches to this gradebook only.

compliance: mandatory – This method is must be implemented.

GradingManager.get\_gradebook\_column (gradebook\_column\_id) Gets the GradebookColumn specified by its Id.

In plenary mode, the exact Id is found or a NotFound results. Otherwise, the returned GradebookColumn may have a different Id than requested, such as the case where a duplicate Id was assigned to a GradebookColumn and retained for compatibility.

Parameters gradebook\_column\_id (osid.id.Id) - Id of the GradebookColumn

Returns the gradebook column

Return type osid.grading.GradebookColumn

**Raise** NotFound - gradebook\_column\_id not found

**Raise** NullArgument - gradebook\_column\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method is must be implemented.

GradingManager.get\_gradebook\_columns\_by\_ids (gradebook\_column\_ids) Gets a GradebookColumnList corresponding to the given IdList.

In plenary mode, the returned list contains all of the gradebook columns specified in the Id list, in the order of the list, including duplicates, or an error results if a Id in the supplied list is not found or inaccessible. Otherwise, inaccessible gradebook columns may be omitted from the list.

**Parameters gradebook\_column\_ids** (osid.id.IdList) - the list of Ids to retrieve

Returns the returned GradebookColumn list

Return type osid.grading.GradebookColumnList

Raise NotFound - an Id was not found

**Raise** NullArgument - grade\_book\_column\_ids is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

GradingManager.get\_gradebook\_columns\_by\_genus\_type (gradebook\_column\_genus\_type) Gets a GradebookColumnList corresponding to the given gradebook column genus Type which does not include gradebook columns of genus types derived from the specified Type.

In plenary mode, the returned list contains all known gradebook columns or an error results. Otherwise, the returned list may contain only those gradebook columns that are accessible through this session.

Parameters gradebook\_column\_genus\_type (osid.type.Type) - a gradebook column genus type

Returns the returned GradebookColumn list

Return type osid.grading.GradebookColumnList

Raise NullArgument - gradebook\_column\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

GradingManager.get\_gradebook\_columns\_by\_parent\_genus\_type (gradebook\_column\_genus\_type) Gets a GradebookColumnList corresponding to the given gradebook column genus Type and include any additional columns with genus types derived from the specified Type. In plenary mode, the returned list contains all known gradebook columns or an error results. Otherwise, the returned list may contain only those gradebook columns that are accessible through this session.

**Parameters gradebook\_column\_genus\_type** (osid.type.Type) - a gradebook column genus type

Returns the returned GradebookColumn list

Return type osid.grading.GradebookColumnList

Raise NullArgument - gradebook\_column\_genus\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

GradingManager.get\_gradebook\_columns\_by\_record\_type (gradebook\_column\_record\_type) Gets a GradebookColumnList containing the given gradebook column record Type.

In plenary mode, the returned list contains all known gradebook columns or an error results. Otherwise, the returned list may contain only those gradebook columns that are accessible through this session.

**Parameters gradebook\_column\_record\_type** (osid.type.Type) - a gradebook column record type

Returns the returned GradebookColumn list

**Return type** osid.grading.GradebookColumnList

**Raise** NullArgument - gradebook\_column\_record\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### GradingManager.gradebook\_columns

Gets all gradebook columns.

In plenary mode, the returned list contains all known gradebook columns or an error results. Otherwise, the returned list may contain only those gradebook columns that are accessible through this session.

Returns a GradebookColumn

Return type osid.grading.GradebookColumnList

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

## GradingManager.supports\_summary()

Tests if a summary entry is available.

**Returns** true if a summary entry is available, false otherwise

Return type boolean

GradingManager.get\_gradebook\_column\_summary (gradebook\_column\_id) Gets the GradebookColumnSummary for summary results.

Parameters gradebook\_column\_id (osid.id.Id) - Id of the GradebookColumn

**Returns** the gradebook column summary

Return type osid.grading.GradebookColumnSummary

Raise NotFound-gradebook\_column\_id is not found

**Raise** NullArgument - gradebook\_column\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

Raise Unimplemented - has\_summary() is false

compliance: mandatory – This method is must be implemented.

## **Gradebook Column Query Methods**

GradingManager.gradebook\_id

Gets the Gradebook Id associated with this session.

Returns the Gradebook Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

## GradingManager.gradebook

Gets the Gradebook associated with this session.

Returns the Gradebook associated with this session

Return type osid.grading.Gradebook

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

GradingManager.can\_search\_gradebook\_columns()

Tests if this user can perform GradebookColumn searches.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer search operations to unauthorized users.

Returns false if search methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

GradingManager.use\_federated\_gradebook\_view()

Federates the view for methods in this session.

A federated view will include gradebook columns in gradebooks which are children of this gradebook in the gradebook hierarchy.

# GradingManager.use\_isolated\_gradebook\_view() Isolates the view for methods in this session.

An isolated view restricts searches to this gradebook only.

compliance: mandatory – This method is must be implemented.

GradingManager.gradebook\_column\_query Gets a gradebook column query.

**Returns** the gradebook column

Return type osid.grading.GradebookColumnQuery

compliance: mandatory – This method must be implemented.

GradingManager.get\_gradebook\_columns\_by\_query (gradebook\_column\_query) Gets a list of gradebook columns matching the given query.

> Parameters gradebook\_column\_query GradebookColumnQuery) - the gradebook column query

(osid.grading.

Returns the returned GradebookColumnList

Return type osid.grading.GradebookColumnList

Raise NullArgument - gradebook\_column\_query is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported - gradebook\_column\_query is not of this service

compliance: mandatory – This method must be implemented.

# **Gradebook Column Admin Methods**

GradingManager.gradebook\_id

Gets the Gradebook Id associated with this session.

Returns the Gradebook Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

GradingManager.gradebook

Gets the Gradebook associated with this session.

Returns the Gradebook associated with this session

Return type osid.grading.Gradebook

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

GradingManager.can\_create\_gradebook\_columns() Tests if this user can create gradebook columns.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating a gradebook column will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer create operations to an unauthorized user.

Returns false if GradebookColumn creation is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

GradingManager.can\_create\_gradebook\_column\_with\_record\_types (gradebook\_column\_record\_types) Tests if this user can create a single GradebookColumn using the desired record types.

While GradingManager.getGradebookColumnRecordTypes () can be used to examine which records are supported, this method tests which record(s) are required for creating a specific GradebookColumn. Providing an empty array tests if a GradebookColumn can be created with no records.

**Parameters gradebook\_column\_record\_types** (osid.type.Type[]) - array of gradebook column record types

**Returns** true if GradebookColumn creation using the specified record Types is supported, false otherwise

Return type boolean

**Raise** NullArgument - gradebook\_column\_record\_types is null

compliance: mandatory – This method must be implemented.

GradingManager.get\_gradebook\_column\_form\_for\_create (gradebook\_column\_record\_types) Gets the gradebook column form for creating new gradebook columns.

A new form should be requested for each create transaction.

**Parameters gradebook\_column\_record\_types** (osid.type.Type[]) - array of gradebook column record types

Returns the gradebook column form

Return type osid.grading.GradebookColumnForm

**Raise** NullArgument - gradebook\_column\_record\_types is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported – unable to get form for requested record types

compliance: mandatory – This method must be implemented.

```
GradingManager.create_gradebook_column (gradebook_column_form)
Creates a new GradebookColumn.
```

**Parameters gradebook\_column\_form** (osid.grading. GradebookColumnForm) – the form for this GradebookColumn

Returns the new GradebookColumn

Return type osid.grading.GradebookColumn

**Raise** IllegalState - gradebook\_column\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

Raise NullArgument - gradebook\_column\_form is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

**Raise** Unsupported – gradebook\_column\_form did not originate from get\_gradebook\_column\_form\_for\_create()

compliance: mandatory – This method must be implemented.

```
GradingManager.can_update_gradebook_columns()
```

Tests if this user can update gradebook columns.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating a GradebookColumn will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer update operations to an unauthorized user.

Returns false if gradebook column modification is not authorized, true otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

GradingManager.get\_gradebook\_column\_form\_for\_update (gradebook\_column\_id) Gets the gradebook column form for updating an existing gradebook column.

A new gradebook column form should be requested for each update transaction.

Parameters gradebook\_column\_id (osid.id.Id) - the Id of the GradebookColumn

Returns the gradebook column form

Return type osid.grading.GradebookColumnForm

**Raise** NotFound - gradebook\_column\_id is not found

Raise NullArgument - gradebook\_column\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

### GradingManager.update\_gradebook\_column (gradebook\_column\_form) Updates an existing gradebook column.

Parameters gradebook_column_form	(osid.grading.
GradebookColumnForm) – the form containing the elements to be updated	

- **Raise** IllegalState gradebook\_column\_form already used in an update transaction
- **Raise** InvalidArgument the form contains an invalid value
- **Raise** NullArgument gradebook\_column\_form is null
- Raise OperationFailed unable to complete request
- Raise PermissionDenied authorization failure
- **Raise** Unsupported gradebook\_column\_form did not originate from get\_gradebook\_column\_form\_for\_update()

compliance: mandatory – This method must be implemented.

GradingManager.sequence\_gradebook\_columns (gradebook\_column\_ids) Resequences the gradebook columns.

```
Parameters gradebook_column_ids (osid.id.IdList) - the Ids of the GradebookColumns
```

Raise NullArgument - gradebook\_column\_id\_list is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

GradingManager.move\_gradebook\_column (front\_gradebook\_column\_id,

back\_gradebook\_column\_id)

Moves a gradebook column in front of another.

#### **Parameters**

- front\_gradebook\_column\_id (osid.id.Id) the Id of a GradebookColumn
- back\_gradebook\_column\_id (osid.id.Id) the Id of a GradebookColumn
- Raise NotFound front\_gradebook\_column\_id or back\_gradebook\_column\_id is not found
- Raise NullArgument front\_gradebook\_column\_id or back\_gradebook\_column\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

GradingManager.copy\_gradebook\_column\_entries(source\_gradebook\_column\_id,

target\_gradebook\_column\_id)

Copies gradebook column entries from one column to another.

If the target grade column grade system differs from the source, the grades in the entries are transformed to the new grade system.

#### **Parameters**

- source\_gradebook\_column\_id (osid.id.Id) the Id of a GradebookColumn
- target\_gradebook\_column\_id (osid.id.Id) the Id of a GradebookColumn
- Raise NotFound source\_gradebook\_column\_id ortarget\_gradebook\_column\_id is not found
- Raise NullArgument source\_gradebook\_column\_id target\_gradebook\_column\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

GradingManager.can\_delete\_gradebook\_columns() Tests if this user can delete gradebook columns.

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting a GradebookColumn will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer delete operations to an unauthorized user.

Returns false if GradebookColumn deletion is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

- GradingManager.delete\_gradebook\_column (gradebook\_column\_id) Deletes the GradebookColumn identified by the given Id.
  - Parameters gradebook\_column\_id (osid.id.Id) the Id of the GradebookColumn to delete

Raise NotFound - a GradebookColumn was not found identified by the given Id

**Raise** NullArgument - gradebook\_column\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

```
GradingManager.can_manage_gradebook_column_aliases()
```

Tests if this user can manage Id aliases for GradebookColumns.

A return of true does not guarantee successful authorization. A return of false indicates that it is known changing an alias will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer alias operations to an unauthorized user.

Returns false if GradebookColumn aliasing is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
GradingManager.alias_gradebook_column (gradebook_column_id, alias_id)
Adds an Id to a GradebookColumn for the purpose of creating compatibility.
```

The primary Id of the GradebookColumn is determined by the provider. The new Id performs as an alias to the primary Id. If the alias is a pointer to another gradebook column, it is reassigned to the given gradebook column Id.

# **Parameters**

- gradebook\_column\_id (osid.id.Id) the Id of a GradebookColumn
- alias\_id (osid.id.Id) the alias Id

Raise AlreadyExists - alias\_id is already assigned

Raise NotFound - gradebook\_column\_id not found

Raise NullArgument - gradebook\_column\_id or alias\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

# **Gradebook Lookup Methods**

```
GradingManager.can_lookup_gradebooks()
```

Tests if this user can perform Gradebook lookups.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

**Returns** false if lookup methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### GradingManager.use\_comparative\_gradebook\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

## GradingManager.use\_plenary\_gradebook\_view()

A complete view of the Gradebook returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

```
GradingManager.get_gradebook (gradebook_id)
Gets the Gradebook specified by its Id.
```

In plenary mode, the exact Id is found or a NotFound results. Otherwise, the returned Gradebook may have a different Id than requested, such as the case where a duplicate Id was assigned to a Gradebook and retained for compatility.

Parameters gradebook\_id (osid.id.Id) - Id of the Gradebook

**Returns** the gradebook

Return type osid.grading.Gradebook

**Raise** NotFound - gradebook\_id not found

**Raise** NullArgument - gradebook\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method is must be implemented.

GradingManager.get\_gradebooks\_by\_ids (gradebook\_ids)

Gets a  $\ensuremath{\mathsf{GradebookList}}$  corresponding to the given  $\ensuremath{\mathsf{IdList}}.$ 

In plenary mode, the returned list contains all of the gradebooks specified in the Id list, in the order of the list, including duplicates, or an error results if an Id in the supplied list is not found or inaccessible. Otherwise, inaccessible Gradebook objects may be omitted from the list and may present the elements in any order including returning a unique set.

Parameters gradebook\_ids (osid.id.IdList) - the list of Ids to retrieve

Returns the returned Gradebook list

Return type osid.grading.GradebookList

Raise NotFound - an Id was not found

Raise NullArgument - gradebook\_ids is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

GradingManager.get\_gradebooks\_by\_genus\_type (gradebook\_genus\_type)

Gets a GradebookList corresponding to the given gradebook genus Type which does not include gradebooks of types derived from the specified Type.

In plenary mode, the returned list contains all known gradebooks or an error results. Otherwise, the returned list may contain only those gradebooks that are accessible through this session.

Parameters gradebook\_genus\_type (osid.type.Type) - a gradebook genus
type

 $Returns \ the \ returned \ {\tt Gradebook} \ list$ 

Return type osid.grading.GradebookList

Raise NullArgument - gradebook\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

GradingManager.get\_gradebooks\_by\_parent\_genus\_type (gradebook\_genus\_type) Gets a GradebookList corresponding to the given gradebook genus Type and include any additional gradebooks with genus types derived from the specified Type.

In plenary mode, the returned list contains all known gradebooks or an error results. Otherwise, the returned list may contain only those gradebooks that are accessible through this session.

Parameters gradebook\_genus\_type (osid.type.Type) - a gradebook genus
type

Returns the returned Gradebook list

Return type osid.grading.GradebookList

**Raise** NullArgument - gradebook\_genus\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

GradingManager.get\_gradebooks\_by\_record\_type (gradebook\_record\_type)

Gets a GradebookList containing the given gradebook record Type.

In plenary mode, the returned list contains all known gradebooks or an error results. Otherwise, the returned list may contain only those gradebooks that are accessible through this session.

Parameters gradebook\_record\_type (osid.type.Type) - a gradebook record
type

Returns the returned Gradebook list

Return type osid.grading.GradebookList

**Raise** NullArgument - gradebook\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

```
GradingManager.get_gradebooks_by_provider (resource_id)
Gets a GradebookList for the given provider "".
```

In plenary mode, the returned list contains all known gradebooks or an error results. Otherwise, the returned list may contain only those gradebooks that are accessible through this session.

Parameters resource\_id (osid.id.Id) - a resource Id

Returns the returned Gradebook list

Return type osid.grading.GradebookList

Raise NullArgument - resource\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

GradingManager.gradebooks

Gets all Gradebooks.

In plenary mode, the returned list contains all known gradebooks or an error results. Otherwise, the returned list may contain only those gradebooks that are accessible through this session.

Returns a GradebookList

Return type osid.grading.GradebookList

Raise OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# **Gradebook Admin Methods**

```
GradingManager.can_create_gradebooks()
```

Tests if this user can create Gradebooks.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating a Gradebook will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer create operations to unauthorized users.

Returns false if Gradebook creation is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

GradingManager.can\_create\_gradebook\_with\_record\_types (gradebook\_record\_types) Tests if this user can create a single Gradebook using the desired record types.

While GradingManager.getGradebookRecordTypes() can be used to examine which records are supported, this method tests which record(s) are required for creating a specific Gradebook. Providing an empty array tests if a Gradebook can be created with no records.

Parameters gradebook\_record\_types(osid.type.Type[]) - array of gradebook record types

**Returns** true if Gradebook creation using the specified Types is supported, false otherwise

Return type boolean

Raise NullArgument - gradebook\_record\_types is null

compliance: mandatory – This method must be implemented.

GradingManager.get\_gradebook\_form\_for\_create (gradebook\_record\_types) Gets the gradebook form for creating new gradebooks.

A new form should be requested for each create transaction.

Parameters gradebook\_record\_types (osid.type.Type[]) - array of gradebook record types

**Returns** the gradebook form

Return type osid.grading.GradebookForm

Raise NullArgument - gradebook\_record\_types is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

**Raise** Unsupported – unable to get form for requested record types

compliance: mandatory – This method must be implemented.

# GradingManager.create\_gradebook(gradebook\_form)

Creates a new Gradebook.

**Parameters gradebook\_form** (osid.grading.GradebookForm) - the form for this Gradebook

**Returns** the new Gradebook

Return type osid.grading.Gradebook

Raise IllegalState - gradebook\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

**Raise** NullArgument - gradebook\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported - gradebook\_form did not originate from
 get\_gradebook\_form\_for\_create()

compliance: mandatory – This method must be implemented.

#### GradingManager.can\_update\_gradebooks()

Tests if this user can update Gradebooks.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating a Gradebook will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer update operations to unauthorized users.

Returns false if Gradebook modification is not authorized, true otherwise

Return type boolean

compliance: mandatory - This method must be implemented.

GradingManager.get\_gradebook\_form\_for\_update (gradebook\_id) Gets the gradebook form for updating an existing gradebook.

A new gradebook form should be requested for each update transaction.

Parameters gradebook\_id (osid.id.Id) - the Id of the Gradebook

**Returns** the gradebook form

Return type osid.grading.GradebookForm

Raise NotFound - gradebook\_id is not found

**Raise** NullArgument - gradebook\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

#### GradingManager.update\_gradebook(gradebook\_form)

Updates an existing gradebook.

**Parameters gradebook\_form** (osid.grading.GradebookForm) – the form containing the elements to be updated

Raise IllegalState - gradebook\_form already used in an update transaction

Raise InvalidArgument - the form contains an invalid value

**Raise** NullArgument - gradebook\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported - gradebook\_form did not originate from
 get\_gradebook\_form\_for\_update()

compliance: mandatory – This method must be implemented.

#### GradingManager.can\_delete\_gradebooks()

Tests if this user can delete gradebooks.

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting a Gradebook will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer delete operations to unauthorized users.

Returns false if Gradebook deletion is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
GradingManager.delete_gradebook (gradebook_id)
```

Deletes a Gradebook.

**Parameters gradebook\_id** (osid.id.Id) - the Id of the Gradebook to remove

Raise NotFound-gradebook\_id not found

**Raise** NullArgument - gradebook\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

GradingManager.can\_manage\_gradebook\_aliases() Tests if this user can manage Id aliases for Gradebooks. A return of true does not guarantee successful authorization. A return of false indicates that it is known changing an alias will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer alias operations to an unauthorized user.

Returns false if Gradebook aliasing is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

GradingManager.**alias\_gradebook** (gradebook\_id, alias\_id) Adds an Id to a Gradebook for the purpose of creating compatibility.

The primary Id of the Gradebook is determined by the provider. The new Id performs as an alias to the primary Id. If the alias is a pointer to another gradebook, it is reassigned to the given gradebook Id.

#### **Parameters**

• gradebook\_id (osid.id.Id) - the Id of a Gradebook

• alias\_id (osid.id.Id) - the alias Id

Raise AlreadyExists - alias\_id is already assigned

Raise NotFound-gradebook\_id not found

Raise NullArgument - gradebook\_id or alias\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# Gradebook

#### Gradebook

```
class dlkit.services.grading.Gradebook (provider_manager, catalog, runtime, proxy, **kwargs)
Bases: dlkit.osid.objects.OsidCatalog, dlkit.osid.sessions.OsidSession
```

A gradebook defines a collection of grade entries.

```
get_gradebook_record (gradebook_record_type)
```

Gets the gradebook record corresponding to the given Gradebook record Type.

This method is used to retrieve an object implementing the requested record. The gradebook\_record\_type may be the Type returned in get\_record\_types() or any of its parents in a Type hierarchy where has\_record\_type(gradebook\_record\_type) is true.

Parameters gradebook\_record\_type (osid.type.Type) - a gradebook record type

Returns the gradebook record

Return type osid.grading.records.GradebookRecord

**Raise** NullArgument - gradebook\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type (gradebook\_record\_type) is false

# **Grade System Lookup Methods**

#### Gradebook.gradebook\_id

Gets the Gradebook Id associated with this session.

Returns the Gradebook Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### Gradebook.gradebook

Gets the Gradebook associated with this session.

Returns the Gradebook associated with this session

**Return type** osid.grading.Gradebook

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# Gradebook.can\_lookup\_grade\_systems()

Tests if this user can perform GradeSystem lookups.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

**Returns** false if lookup methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# Gradebook.use\_comparative\_grade\_system\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

# Gradebook.use\_plenary\_grade\_system\_view()

A complete view of the GradeSystem returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

# Gradebook.use\_federated\_gradebook\_view()

Federates the view for methods in this session.

A federated view will include grade entries in gradebooks which are children of this gradebook in the gradebook hierarchy.

compliance: mandatory – This method is must be implemented.

# Gradebook.use\_isolated\_gradebook\_view()

Isolates the view for methods in this session.

An isolated view restricts searches to this gradebook only.

```
Gradebook.get_grade_system(grade_system_id)
Gets the GradeSystem specified by its Id.
```

In plenary mode, the exact Id is found or a NotFound results. Otherwise, the returned GradeSystem may have a different Id than requested, such as the case where a duplicate Id was assigned to a GradeSystem and retained for compatibility.

Parameters grade\_system\_id (osid.id.Id) - Id of the GradeSystem

Returns the grade system

Return type osid.grading.GradeSystem

Raise NotFound-grade\_system\_id not found

Raise NullArgument - grade\_system\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method is must be implemented.

Gradebook.get\_grade\_system\_by\_grade(grade\_id) Gets the GradeSystem by a Grade Id.

Parameters grade\_id (osid.id.Id) - Id of a Grade

**Returns** the grade system

Return type osid.grading.GradeSystem

Raise NotFound - grade\_id not found

Raise NullArgument - grade\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method is must be implemented.

Gradebook.get\_grade\_systems\_by\_ids (grade\_system\_ids)

Gets a  $\ensuremath{\mathsf{GradeSystemList}}$  corresponding to the given  $\ensuremath{\mathsf{IdList}}$  .

In plenary mode, the returned list contains all of the systems specified in the Id list, in the order of the list, including duplicates, or an error results if an Id in the supplied list is not found or inaccessible. Otherwise, inaccessible GradeSystems may be omitted from the list and may present the elements in any order including returning a unique set.

Parameters grade\_system\_ids (osid.id.IdList) - the list of Ids to retrieve

Returns the returned GradeSystem list

Return type osid.grading.GradeSystemList

Raise NotFound - an Id was not found

Raise NullArgument - grade\_system\_ids is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

Gradebook.get\_grade\_systems\_by\_genus\_type(grade\_system\_genus\_type)

Gets a GradeSystemList corresponding to the given grade system genus Type which does not include systems of genus types derived from the specified Type.

In plenary mode, the returned list contains all known systems or an error results. Otherwise, the returned list may contain only those systems that are accessible through this session.

Parameters grade\_system\_genus\_type (osid.type.Type) - a grade system
 genus type

**Returns** the returned GradeSystem list

Return type osid.grading.GradeSystemList

Raise NullArgument - grade\_system\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Gradebook.get\_grade\_systems\_by\_parent\_genus\_type (grade\_system\_genus\_type) Gets a GradeSystemList corresponding to the given grade system genus Type and include any additional systems with genus types derived from the specified Type.

In plenary mode, the returned list contains all known systems or an error results. Otherwise, the returned list may contain only those systems that are accessible through this session.

Parameters grade\_system\_genus\_type (osid.type.Type) - a grade system
 genus type

Returns the returned GradeSystem list

Return type osid.grading.GradeSystemList

**Raise** NullArgument - grade\_system\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Gradebook.get\_grade\_systems\_by\_record\_type(grade\_system\_record\_type)

Gets a GradeSystemList containing the given grade record Type.

In plenary mode, the returned list contains all known systems or an error results. Otherwise, the returned list may contain only those systems that are accessible through this session.

Parameters grade\_system\_record\_type (osid.type.Type) - a grade system
 record type

**Returns** the returned GradeSystem list

Return type osid.grading.GradeSystemList

**Raise** NullArgument - grade\_system\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

#### Gradebook.grade\_systems

Gets all GradeSystems.

In plenary mode, the returned list contains all known grade systems or an error results. Otherwise, the returned list may contain only those grade systems that are accessible through this session.

Returns a GradeSystemList

Return type osid.grading.GradeSystemList

 $Raise \ {\tt OperationFailed-unable to \ complete \ request}$ 

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

# **Grade System Query Methods**

#### Gradebook.gradebook\_id

Gets the Gradebook Id associated with this session.

Returns the Gradebook Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### Gradebook.gradebook

Gets the Gradebook associated with this session.

Returns the Gradebook associated with this session

**Return type** osid.grading.Gradebook

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Gradebook.can\_search\_grade\_systems()

Tests if this user can perform GradeSystem searches.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer search operations to unauthorized users.

Returns false if search methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# Gradebook.use\_federated\_gradebook\_view()

Federates the view for methods in this session.

A federated view will include grade entries in gradebooks which are children of this gradebook in the gradebook hierarchy.

compliance: mandatory - This method is must be implemented.

#### Gradebook.use\_isolated\_gradebook\_view() Isolates the view for methods in this session.

An isolated view restricts searches to this gradebook only.

compliance: mandatory - This method is must be implemented.

Gradebook.grade\_system\_query Gets a grade system query.

**Returns** a grade system query

Return type osid.grading.GradeSystemQuery

compliance: mandatory – This method must be implemented.

Gradebook.get\_grade\_systems\_by\_query (grade\_system\_query) Gets a list of GradeSystem objects matching the given grade system query.

Parameters grade\_system\_query (osid.grading.GradeSystemQuery) the grade system query

Returns the returned GradeSystemList

Return type osid.grading.GradeSystemList

Raise NullArgument - grade\_system\_query is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported - grade\_system\_query is not of this service

compliance: mandatory – This method must be implemented.

## **Grade System Admin Methods**

Gradebook.gradebook\_id

Gets the Gradebook Id associated with this session.

Returns the Gradebook Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### Gradebook.gradebook

Gets the Gradebook associated with this session.

Returns the Gradebook associated with this session

**Return type** osid.grading.Gradebook

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Gradebook.can\_create\_grade\_systems()

Tests if this user can create GradeSystems.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating a GradeSystem will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer create operations to unauthorized users.

Returns false if GradeSystem creation is not authorized, true otherwise

Return type boolean

Gradebook.can\_create\_grade\_system\_with\_record\_types (grade\_system\_record\_types) Tests if this user can create a single GradeSystem using the desired record types.

While GradingManager.getGradeSystemRecordTypes() can be used to examine which records are supported, this method tests which record(s) are required for creating a specific GradeSystem. Providing an empty array tests if a GradeSystem can be created with no records.

Parameters grade\_system\_record\_types (osid.type.Type[]) - array of grade system types

**Returns** true if GradeSystem creation using the specified Types is supported, false otherwise

Return type boolean

**Raise** NullArgument - grade\_system\_record\_types is null

compliance: mandatory – This method must be implemented.

Gradebook.get\_grade\_system\_form\_for\_create (grade\_system\_record\_types) Gets the grade system form for creating new grade systems.

A new form should be requested for each create transaction.

Parameters grade\_system\_record\_types (osid.type.Type[]) - array of grade system types

**Returns** the grade system form

Return type osid.grading.GradeSystemForm

**Raise** NullArgument - grade\_system\_record\_types is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

**Raise** Unsupported – unable to get form for requested record types

compliance: mandatory – This method must be implemented.

#### Gradebook.create\_grade\_system(grade\_system\_form)

Creates a new GradeSystem.

Parameters grade\_system\_form (osid.grading.GradeSystemForm) - the
 form for this GradeSystem

Returns the new GradeSystem

Return type osid.grading.GradeSystem

**Raise** IllegalState - grade\_system\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

**Raise** NullArgument - grade\_system\_form is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported - grade\_system\_form did not originate from
 get\_grade\_system\_form\_for\_create()

# Gradebook.can\_update\_grade\_systems()

Tests if this user can update GradeSystems.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating a GradeSystem will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer update operations to unauthorized users.

Returns false if GradeSystem modification is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
Gradebook.get_grade_system_form_for_update(grade_system_id)
```

Gets the grade system form for updating an existing grade system.

A new grade system form should be requested for each update transaction.

Parameters grade\_system\_id (osid.id.Id) - the Id of the GradeSystem

Returns the grade system form

Return type osid.grading.GradeSystemForm

**Raise** NotFound - grade\_system\_id is not found

Raise NullArgument - grade\_system\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## Gradebook.update\_grade\_system(grade\_system\_form)

Updates an existing grade system.

**Parameters grade\_system\_form** (osid.grading.GradeSystemForm) - the form containing the elements to be updated

Raise IllegalState - grade\_system\_form already used in an update transaction

Raise InvalidArgument - the form contains an invalid value

**Raise** NullArgument - grade\_system\_form is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported - grade\_system\_form did not originate from
 get\_grade\_system\_form\_for\_update()

compliance: mandatory – This method must be implemented.

Gradebook.can\_delete\_grade\_systems()

Tests if this user can delete grade systems.

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting a GradeSystem will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer delete operations to unauthorized users.

**Returns** false if GradeSystem deletion is not authorized, true otherwise

Return type boolean

Gradebook.delete\_grade\_system(grade\_system\_id) Deletes a GradeSystem.

Parameters grade\_system\_id (osid.id.Id) - the Id of the GradeSystem to
 remove

Raise NotFound-grade\_system\_id not found

Raise NullArgument - grade\_system\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

Gradebook.can\_manage\_grade\_system\_aliases()

Tests if this user can manage Id aliases for GradeSystems.

A return of true does not guarantee successful authorization. A return of false indicates that it is known changing an alias will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer alias operations to an unauthorized user.

**Returns** false if GradeSystem aliasing is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
Gradebook.alias_grade_system(grade_system_id, alias_id)
```

Adds an Id to a GradeSystem for the purpose of creating compatibility.

The primary Id of the GradeSystem is determined by the provider. The new Id performs as an alias to the primary Id. If the alias is a pointer to another grade system, it is reassigned to the given grade system Id.

# Parameters

- grade\_system\_id(osid.id.Id) the Id of a GradeSystem
- alias\_id (osid.id.Id) the alias Id

Raise AlreadyExists - alias\_id is already assigned

Raise NotFound-grade\_system\_id not found

**Raise** NullArgument - grade\_system\_id or alias\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

```
Gradebook.can_create_grades(grade_system_id)
```

Tests if this user can create Grade s for a GradeSystem.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating a GradeSystem will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer create operations to unauthorized users.

Parameters grade\_system\_id (osid.id.Id) - the Id of a GradeSystem

Returns false if Grade creation is not authorized, true otherwise

Return type boolean

**Raise** NullArgument - grade\_system\_id is null

compliance: mandatory – This method must be implemented.

Gradebook.can\_create\_grade\_with\_record\_types(grade\_system\_id,

grade\_record\_types)

Tests if this user can create a single Grade using the desired record types.

While GradingManager.getGradeRecordTypes() can be used to examine which records are supported, this method tests which record(s) are required for creating a specific Grade. Providing an empty array tests if a Grade can be created with no records.

#### **Parameters**

- grade\_system\_id(osid.id.Id) the Id of a GradeSystem
- grade\_record\_types (osid.type.Type[]) array of grade recod types

**Returns** true if Grade creation using the specified Types is supported, false otherwise

Return type boolean

**Raise** NullArgument - grade\_system\_id or grade\_record\_types is null

compliance: mandatory – This method must be implemented.

Gradebook.get\_grade\_form\_for\_create(grade\_system\_id, grade\_record\_types) Gets the grade form for creating new grades.

A new form should be requested for each create transaction.

#### Parameters

- grade\_system\_id (osid.id.Id) the Id of a GradeSystem
- grade\_record\_types (osid.type.Type[]) array of grade recod types

Returns the grade form

Return type osid.grading.GradeForm

Raise NotFound-grade\_system\_id is not found

Raise NullArgument - grade\_system\_id or grade\_record\_types is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

**Raise** Unsupported – unable to get form for requested record types

compliance: mandatory – This method must be implemented.

Gradebook.create\_grade(grade\_form)

Creates a new Grade.

Parameters grade\_form (osid.grading.GradeForm) - the form for this Grade

Returns the new Grade

Return type osid.grading.Grade

Raise IllegalState - grade\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

**Raise** NullArgument - grade\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported - grade\_form did not originate from
get\_grade\_form\_for\_create()

compliance: mandatory – This method must be implemented.

```
Gradebook.can_update_grades(grade_system_id)
```

Tests if this user can update Grades.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating a Grade will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer update operations to unauthorized users.

Parameters grade\_system\_id (osid.id.Id) - the Id of a GradeSystem

Returns false if Grade modification is not authorized, true otherwise

Return type boolean

**Raise** NullArgument - grade\_system\_id is null

compliance: mandatory – This method must be implemented.

Gradebook.get\_grade\_form\_for\_update(grade\_id) Gets the grade form for updating an existing grade.

A new grade form should be requested for each update transaction.

Parameters grade\_id (osid.id.Id) - the Id of the Grade

Returns the grade form

Return type osid.grading.GradeForm

**Raise** NotFound-grade\_id is not found

**Raise** NullArgument - grade\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# Gradebook.update\_grade(grade\_form)

Updates an existing grade.

**Parameters grade\_form** (osid.grading.GradeForm) – the form containing the elements to be updated

**Raise** IllegalState - grade\_form already used in an update transaction

Raise InvalidArgument - the form contains an invalid value

**Raise** NullArgument - grade\_id or grade\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

**Raise** Unsupported – grade\_form did not originate from get\_grade\_form\_for\_update()

compliance: mandatory – This method must be implemented.

# Gradebook.can\_delete\_grades (grade\_system\_id)

Tests if this user can delete grades.

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting a Grade will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer delete operations to unauthorized users.

Parameters grade\_system\_id (osid.id.Id) - the Id of a GradeSystem

Returns false if Grade deletion is not authorized, true otherwise

Return type boolean

Raise NullArgument - grade\_system\_id is null

compliance: mandatory – This method must be implemented.

# Gradebook.delete\_grade(grade\_id)

Deletes a Grade.

Parameters grade\_id (osid.id.Id) - the Id of the Grade to remove

Raise NotFound-grade\_id not found

Raise NullArgument - grade\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Gradebook.can\_manage\_grade\_aliases()

Tests if this user can manage Id aliases for Grades.

A return of true does not guarantee successful authorization. A return of false indicates that it is known changing an alias will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer alias operations to an unauthorized user.

Returns false if Grade aliasing is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Gradebook.alias\_grade(grade\_id, alias\_id)

Adds an Id to a Grade for the purpose of creating compatibility.

The primary Id of the Grade is determined by the provider. The new Id performs as an alias to the primary Id. If the alias is a pointer to another grade, it is reassigned to the given grade Id.

#### **Parameters**

- grade\_id (osid.id.Id) the Id of a Grade
- alias\_id (osid.id.Id) the alias Id

**Raise** AlreadyExists - alias\_id is already assigned

Raise NotFound-grade\_id not found

Raise NullArgument - grade\_id or alias\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

# **Grade Entry Lookup Methods**

#### Gradebook.gradebook\_id

Gets the Gradebook Id associated with this session.

Returns the Gradebook Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### Gradebook.gradebook

Gets the Gradebook associated with this session.

Returns the Gradebook associated with this session

**Return type** osid.grading.Gradebook

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# Gradebook.can\_lookup\_grade\_entries()

Tests if this user can perform GradeEntry lookups.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

**Returns** false if lookup methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# Gradebook.use\_comparative\_grade\_entry\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

# Gradebook.use\_plenary\_grade\_entry\_view()

A complete view of the GradeEntry returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory - This method is must be implemented.

# Gradebook.use\_federated\_gradebook\_view()

Federates the view for methods in this session.

A federated view will include grade entries in gradebooks which are children of this gradebook in the gradebook hierarchy.

compliance: mandatory – This method is must be implemented.

# Gradebook.use\_isolated\_gradebook\_view()

Isolates the view for methods in this session.

An isolated view restricts searches to this gradebook only.

Gradebook.use\_effective\_grade\_entry\_view() Only grade entries whose effective dates are current are returned by methods in this session.

compliance: mandatory – This method is must be implemented.

Gradebook.use\_any\_effective\_grade\_entry\_view() All grade entries of any effective dates are returned by methods in this session.

compliance: mandatory – This method is must be implemented.

Gradebook.get\_grade\_entry (grade\_entry\_id) Gets the GradeEntry specified by its Id.

Parameters grade\_entry\_id (osid.id.Id) - Id of the GradeEntry

Returns the grade entry

Return type osid.grading.GradeEntry

Raise NotFound-grade\_entry\_id not found

**Raise** NullArgument - grade\_entry\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method is must be implemented.

### Gradebook.get\_grade\_entries\_by\_ids (grade\_entry\_ids) Gets a GradeEntryList corresponding to the given IdList.

Parameters grade\_entry\_ids (osid.id.IdList) - the list of Ids to retrieve

Returns the returned GradeEntry list

Return type osid.grading.GradeEntryList

 $Raise \; \text{NotFound} - an \; \text{Id} \; \text{was} \; not \; found$ 

Raise NullArgument - grade\_entry\_ids is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Gradebook.get\_grade\_entries\_by\_genus\_type(grade\_entry\_genus\_type)

Gets a GradeEntryList corresponding to the given grade entry genus Type which does not include grade entries of genus types derived from the specified Type.

Parameters grade\_entry\_genus\_type (osid.type.Type) - a grade entry
genus type

 $Returns \ the \ returned \ {\tt GradeEntry} \ list$ 

Return type osid.grading.GradeEntryList

Raise NullArgument - grade\_entry\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

Gradebook.get\_grade\_entries\_by\_parent\_genus\_type (grade\_entry\_genus\_type) Gets a GradeEntryList corresponding to the given grade entry genus Type and include any additional grade entry with genus types derived from the specified Type.

Parameters grade\_entry\_genus\_type (osid.type.Type) - a grade entry
genus type

Returns the returned GradeEntry list

Return type osid.grading.GradeEntryList

Raise NullArgument - grade\_entry\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## Gradebook.get\_grade\_entries\_by\_record\_type (grade\_entry\_record\_type)

Gets a GradeEntryList containing the given grade entry record Type.

Parameters grade\_entry\_record\_type (osid.type.Type) - a grade entry
record type

Returns the returned GradeEntry list

Return type osid.grading.GradeEntryList

Raise NullArgument - grade\_entry\_record\_type is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# Gradebook.get\_grade\_entries\_on\_date(from\_, to)

Gets a GradeEntryList effective during the entire given date range inclusive but not confined to the date range.

## **Parameters**

- from (osid.calendaring.DateTime) start of date range
- to (osid.calendaring.DateTime) end of date range

Returns the returned GradeEntry list

Return type osid.grading.GradeEntryList

**Raise** InvalidArgument – from is greater than to

Raise NullArgument - from or to is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Gradebook.get\_grade\_entries\_for\_gradebook\_column (gradebook\_column\_id) Gets a GradeEntryList for the gradebook column.

Parameters gradebook\_column\_id (osid.id.Id) - a gradebook column Id

 $Returns \ the \ returned \ {\tt GradeEntry} \ list$ 

**Return type** osid.grading.GradeEntryList

**Raise** NullArgument - gradebook\_column\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Gradebook.get\_grade\_entries\_for\_gradebook\_column\_on\_date(gradebook\_column\_id,

from\_, to)

Gets a GradeEntryList for the given gradebook column and effective during the entire given date range inclusive but not confined to the date range.

## Parameters

- gradebook\_column\_id (osid.id.Id) a gradebook column Id
- from (osid.calendaring.DateTime) start of date range
- to (osid.calendaring.DateTime) end of date range

Returns the returned GradeEntry list

Return type osid.grading.GradeEntryList

**Raise** InvalidArgument – from is greater than to

Raise NullArgument-gradebook\_column\_id, from, or to is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Gradebook.get\_grade\_entries\_for\_resource(resource\_id)

Gets a GradeEntryList for the given key key resource.

Parameters resource\_id (osid.id.Id) - a key resource Id

Returns the returned GradeEntry list

Return type osid.grading.GradeEntryList

Raise NullArgument - resource\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Gradebook.get\_grade\_entries\_for\_resource\_on\_date(resource\_id, from\_, to)

Gets a GradeEntryList for the given key resource and effective during the entire given date range inclusive but not confined to the date range.

# Parameters

- resource\_id (osid.id.Id) a resource Id
- from (osid.calendaring.DateTime) start of date range
- to (osid.calendaring.DateTime) end of date range

Returns the returned GradeEntry list

Return type osid.grading.GradeEntryList

**Raise** InvalidArgument – from is greater than to

Raise NullArgument - resource\_id, from, or to is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

Gradebook.get\_grade\_entries\_for\_gradebook\_column\_and\_resource(gradebook\_column\_id,

source\_id)

re-

Gets a GradeEntryList for the gradebook column and key resource.

# Parameters

- gradebook\_column\_id (osid.id.Id) a gradebook column Id
- resource\_id (osid.id.Id) a key resource Id

Returns the returned GradeEntry list

Return type osid.grading.GradeEntryList

Raise NullArgument - gradebook\_column\_id or resource\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Gradebook.get\_grade\_entries\_for\_gradebook\_column\_and\_resource\_on\_date (gradebook\_column\_id,

re-	
source_	_id,
from_,	
to)	

Gets a GradeEntryList for the given gradebook column, resource, and effective during the entire given date range inclusive but not confined to the date range.

#### **Parameters**

- gradebook\_column\_id (osid.id.Id) a gradebook column Id
- resource\_id (osid.id.Id) a key resource Id
- from (osid.calendaring.DateTime) start of date range
- to (osid.calendaring.DateTime) end of date range

Returns the returned GradeEntry list

Return type osid.grading.GradeEntryList

Raise InvalidArgument - from is greater than to

Raise NullArgument - gradebook\_column\_id, resource, from, or

to is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented.* 

Gradebook.get\_grade\_entries\_by\_grader (resource\_id) Gets a GradeEntryList for the given grader.

**Parameters resource\_id** (osid.id.Id) - a resource Id

Returns the returned GradeEntry list

Return type osid.grading.GradeEntryList

Raise NullArgument - resource\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Gradebook.grade\_entries

Gets all grade entries.

**Returns** a GradeEntryList

**Return type** osid.grading.GradeEntryList

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# **Grade Entry Query Methods**

#### Gradebook.gradebook\_id

Gets the Gradebook Id associated with this session.

Returns the Gradebook Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### Gradebook.gradebook

Gets the Gradebook associated with this session.

Returns the Gradebook associated with this session

Return type osid.grading.Gradebook

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# Gradebook.can\_search\_grade\_entries()

Tests if this user can perform GradeEntry searches.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer search operations to unauthorized users.

**Returns** false if search methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# Gradebook.use\_federated\_gradebook\_view()

Federates the view for methods in this session.

A federated view will include grade entries in gradebooks which are children of this gradebook in the gradebook hierarchy.

compliance: mandatory – This method is must be implemented.

Gradebook.use\_isolated\_gradebook\_view() Isolates the view for methods in this session.

An isolated view restricts searches to this gradebook only.

compliance: mandatory – This method is must be implemented.

Gradebook.grade\_entry\_query

Gets a grade entry query.

**Returns** the grade entry query

Return type osid.grading.GradeEntryQuery

compliance: mandatory – This method must be implemented.

- Gradebook.get\_grade\_entries\_by\_query (grade\_entry\_query) Gets a list of entries matching the given grade entry query.
  - Parameters grade\_entry\_query (osid.grading.GradeEntryQuery) the
     grade entry query

Returns the returned GradeEntryList

Return type osid.grading.GradeEntryList

Raise NullArgument - grade\_entry\_query is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported - grade\_entry\_query is not of this service

compliance: mandatory – This method must be implemented.

# **Grade Entry Admin Methods**

```
Gradebook.gradebook_id
```

Gets the Gradebook Id associated with this session.

Returns the Gradebook Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### Gradebook.gradebook

Gets the Gradebook associated with this session.

Returns the Gradebook associated with this session

Return type osid.grading.Gradebook

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# Gradebook.can\_create\_grade\_entries() Tests if this user can create grade entries.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating a grade entry will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer create operations to an unauthorized user.

Returns false if GradeEntry creation is not authorized, true otherwise

Return type boolean

compliance: mandatory - This method must be implemented.

Gradebook.can\_create\_grade\_entry\_with\_record\_types (grade\_entry\_record\_types) Tests if this user can create a single GradeEntry using the desired record types.

While GradingManager.getGradeEntryRecordTypes() can be used to examine which records are supported, this method tests which record(s) are required for creating a specific GradeEntry. Providing an empty array tests if a GradeEntry can be created with no records.

```
Parameters grade_entry_record_types (osid.type.Type[]) - array of grade entry record types
```

**Returns** true if GradeEntry creation using the specified record Types is supported, false otherwise

Return type boolean

**Raise** NullArgument - grade\_entry\_record\_types is null

compliance: mandatory – This method must be implemented.

Gradebook.get\_grade\_entry\_form\_for\_create(gradebook\_column\_id, resource\_id, grade\_entry\_record\_types)

Gets the grade entry form for creating new grade entries.

A new form should be requested for each create transaction.

## Parameters

- gradebook\_column\_id (osid.id.Id) the gradebook column
- resource\_id (osid.id.Id) the key resource
- grade\_entry\_record\_types (osid.type.Type[]) array of grade entry record types

**Returns** the grade entry form

Return type osid.grading.GradeEntryForm

**Raise** NotFound - gradebook\_column\_id or resource\_id not found

Raise NullArgument - gradebook\_column\_id, resource\_id, or grade\_entry\_record\_types is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

Raise Unsupported – unable to get form for requested record types

compliance: mandatory – This method must be implemented.

```
Gradebook.create_grade_entry(grade_entry_form)
```

```
Creates a new GradeEntry.
```

```
Parameters grade_entry_form (osid.grading.GradeEntryForm) - the form for this GradeEntry
```

Returns the new GradeEntry

Return type osid.grading.GradeEntry

**Raise** IllegalState - grade\_entry\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

Raise NullArgument - grade\_entry\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported - grade\_entry\_form did not originate from
 get\_grade\_entry\_form\_for\_create()

compliance: mandatory – This method must be implemented.

#### Gradebook.can\_overridecalculated\_grade\_entries()

Tests if this user can override grade entries calculated from another.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating a grade entry will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer create operations to an unauthorized user.

**Returns** false if GradeEntry override is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Gradebook.get\_grade\_entry\_form\_for\_override(grade\_entry\_id,

grade\_entry\_record\_types)

Gets the grade entry form for overriding calculated grade entries.

A new form should be requested for each create transaction.

# Parameters

- grade\_entry\_id (osid.id.Id) the Id of the grade entry to be overridden
- grade\_entry\_record\_types (osid.type.Type[]) array of grade entry record types

Returns the grade entry form

**Return type** osid.grading.GradeEntryForm

Raise AlreadyExists - grade\_entry\_id is already overridden

- **Raise** NotFound grade\_entry\_id not found or grade\_entry\_id is not a calculated entry
- **Raise** NullArgument grade\_entry\_id or grade\_entry\_record\_types is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported – unable to get form for requested record types

```
Gradebook.override_calculated_grade_entry(grade_entry_form)
Creates a new overriding GradeEntry.
```

```
Parameters grade_entry_form (osid.grading.GradeEntryForm) - the
form for this GradeEntry
```

Returns the new GradeEntry

Return type osid.grading.GradeEntry

Raise IllegalState - grade\_entry\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

Raise NullArgument - grade\_entry\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

**Raise** Unsupported - grade\_entry\_form did not originate from get\_grade\_entry\_form\_for\_override()

compliance: mandatory – This method must be implemented.

#### Gradebook.can\_update\_grade\_entries()

Tests if this user can update grade entries.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating a GradeEntry will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer update operations to an unauthorized user.

Returns false if grade entry modification is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Gradebook.get\_grade\_entry\_form\_for\_update(grade\_entry\_id) Gets the grade entry form for updating an existing entry.

A new grade entry form should be requested for each update transaction.

Parameters grade\_entry\_id (osid.id.Id) - the Id of the GradeEntry

**Returns** the grade entry form

Return type osid.grading.GradeEntryForm

**Raise** NotFound - grade\_entry\_id is not found

**Raise** NullArgument - grade\_entry\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Gradebook.update\_grade\_entry(grade\_entry\_form)

Updates an existing grade entry.

**Parameters grade\_entry\_form** (osid.grading.GradeEntryForm) - the form containing the elements to be updated

**Raise** IllegalState - grade\_entry\_form already used in an update transaction

Raise InvalidArgument - the form contains an invalid value

Raise NullArgument - grade\_entry\_form is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

Raise Unsupported - grade\_entry\_form did not originate from
get\_grade\_entry\_form\_for\_update()

compliance: mandatory – This method must be implemented.

```
Gradebook.can_delete_grade_entries()
```

Tests if this user can delete grade entries.

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting a GradeEntry will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer delete operations to an unauthorized user.

Returns false if GradeEntry deletion is not authorized, true otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

```
Gradebook.delete_grade_entry(grade_entry_id)
```

Deletes the GradeEntry identified by the given Id.

Raise NotFound - a GradeEntry was not found identified by the given Id

**Raise** NullArgument - grade\_entry\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

### Gradebook.can\_manage\_grade\_entry\_aliases()

Tests if this user can manage Id aliases for GradeEntries.

A return of true does not guarantee successful authorization. A return of false indicates that it is known changing an alias will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer alias operations to an unauthorized user.

Returns false if GradeEntry aliasing is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Gradebook.alias\_grade\_entry(grade\_entry\_id, alias\_id)

Adds an Id to a GradeEntry for the purpose of creating compatibility.

The primary Id of the GradeEntry is determined by the provider. The new Id performs as an alias to the primary Id. If the alias is a pointer to another grade entry, it is reassigned to the given grade entry Id.

### **Parameters**

• grade\_entry\_id (osid.id.Id) - the Id of a GradeEntry

• alias\_id (osid.id.Id) - the alias Id

Raise AlreadyExists - alias\_id is already assigned

Raise NotFound-grade\_entry\_id not found

Raise NullArgument - grade\_entry\_id or alias\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# **Objects**

# Grade

class dlkit.grading.objects.Grade

Bases: dlkit.osid.objects.OsidObject, dlkit.osid.markers.Subjugateable

A Grade.

Grades represent qualified performance levels defined within some grading system.

### grade\_system\_id

Gets the GradeSystem Id in which this grade belongs.

Returns the grade system Id

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

## grade\_system

Gets the GradeSystem in which this grade belongs.

**Returns** the grade system

Return type osid.grading.GradeSystem

compliance: mandatory – This method must be implemented.

### input\_score\_start\_range

Gets the low end of the input score range equivalent to this grade.

Returns the start range

Return type decimal

compliance: mandatory – This method must be implemented.

### input\_score\_end\_range

Gets the high end of the input score range equivalent to this grade.

**Returns** the end range

Return type decimal

compliance: mandatory – This method must be implemented.

### output\_score

Gets the output score for this grade used for calculating cumultives or performing articulation.

**Returns** the output score

Return type decimal

compliance: mandatory – This method must be implemented.

## get\_grade\_record (grade\_record\_type)

Gets the grade record corresponding to the given Grade record Type.

This method is used to retrieve an object implementing the requested record. The grade\_record\_type may be the Type returned in get\_record\_types () or any of its parents in a Type hierarchy where has\_record\_type (grade\_record\_type) is true.

Parameters grade\_record\_type (osid.type.Type) - the type of the record to retrieve

Returns the grade record

Return type osid.grading.records.GradeRecord

Raise NullArgument - grade\_record\_type is null

Raise OperationFailed – unable to complete request

**Raise** Unsupported - has\_record\_type (grade\_record\_type) is false

compliance: mandatory – This method must be implemented.

# **Grade Form**

class dlkit.grading.objects.GradeForm

Bases: dlkit.osid.objects.OsidObjectForm, dlkit.osid.objects. OsidSubjugateableForm

This is the form for creating and updating Grades.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the GradeAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

#### input\_score\_start\_range\_metadata

Gets the metadata for the input score start range.

Returns metadata for the input score start range

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

#### input\_score\_start\_range

#### input\_score\_end\_range\_metadata

Gets the metadata for the input score start range.

Returns metadata for the input score start range

Return type osid.Metadata

*compliance: mandatory – This method must be implemented.* 

# input\_score\_end\_range

### output\_score\_metadata

Gets the metadata for the output score start range.

**Returns** metadata for the output score start range

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

### output\_score

#### get\_grade\_form\_record (grade\_record\_type)

Gets the GradeFormRecord corresponding to the given grade record Type.

Parameters grade\_record\_type (osid.type.Type) - the grade record type
Returns the grade form record
Return type osid.grading.records.GradeFormRecord
Raise NullArgument - grade\_record\_type is null
Raise OperationFailed - unable to complete request
Raise Unsupported - has\_record\_type (grade\_record\_type) is false
compliance: mandatory - This method must be implemented.

# **Grade List**

```
class dlkit.grading.objects.GradeList
```

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, GradeList provides a means for accessing Grade elements sequentially either one at a time or many at a time.

Examples: while (gl.hasNext()) { Grade grade = gl.getNextGrade(); }

or

while (gl.hasNext()) { Grade[] grades = gl.getNextGrades(gl.available());

### }

# next\_grade

Gets the next Grade in this list.

**Returns** the next Grade in this list. The has\_next() method should be used to test that a next Grade is available before calling this method.

Return type osid.grading.Grade

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

### get\_next\_grades (n)

Gets the next set of Grade elements in this list which must be less than or equal to the return from available().

- Parameters n (cardinal) the number of Grade elements requested which must be less
  than or equal to available()
- **Returns** an array of Grade elements. The length of the array is less than or equal to the number specified.

Return type osid.grading.Grade

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

# **Grade System**

```
class dlkit.grading.objects.GradeSystem
```

Bases: dlkit.osid.objects.OsidObject, dlkit.osid.markers.Aggregateable

A GradeSystem represents a grading system.

The system can be based on assigned Grades or based on a numeric scale.

#### is\_based\_on\_grades()

Tests if the grading system is based on grades.

Returns true if the grading system is based on grades, false if the system is a numeric score

Return type boolean

compliance: mandatory – This method must be implemented.

#### grade\_ids

Gets the grade Ids in this system ranked from highest to lowest.

Returns the list of grades Ids

Return type osid.id.IdList

Raise IllegalState - is\_based\_on\_grades() is false

compliance: mandatory – This method must be implemented.

#### grades

Gets the grades in this system ranked from highest to lowest.

Returns the list of grades

Return type osid.grading.GradeList

Raise IllegalState - is\_based\_on\_grades() is false

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

# lowest\_numeric\_score

Gets the lowest number in a numeric grading system.

**Returns** the lowest number

Return type decimal

Raise IllegalState - is\_based\_on\_grades() is true

compliance: mandatory – This method must be implemented.

#### numeric\_score\_increment

Gets the incremental step.

**Returns** the increment

Return type decimal

**Raise** IllegalState - is\_based\_on\_grades() is true

compliance: mandatory – This method must be implemented.

#### highest\_numeric\_score

Gets the highest number in a numeric grading system.

**Returns** the highest number

Return type decimal

**Raise** IllegalState - is\_based\_on\_grades() is true

compliance: mandatory – This method must be implemented.

```
get_grade_system_record (grade_system_record_type)
```

Gets the grade system record corresponding to the given GradeSystem record Type.

This method is used to retrieve an object implementing the requested record. The grade\_system\_record\_type may be the Type returned in get\_record\_types() or any of its parents in a Type hierarchy where has\_record\_type(grade\_system\_record\_type) is true

Parameters grade\_system\_record\_type (osid.type.Type) - the type of the record
 to retrieve

Returns the grade system record

Return type osid.grading.records.GradeSystemRecord

**Raise** NullArgument - grade\_system\_record\_type is null

Raise OperationFailed - unable to complete request

Raise Unsupported - has\_record\_type(grade\_system\_record\_type) is
false

compliance: mandatory – This method must be implemented.

### **Grade System Form**

class dlkit.grading.objects.GradeSystemForm

Bases: dlkit.osid.objects.OsidObjectForm, dlkit.osid.objects. OsidAggregateableForm

This is the form for creating and updating GradeSystems.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the GradeSystemAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

### based\_on\_grades\_metadata

Gets the metadata for a grade-based designation.

Returns metadata for the grade-based designation

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

### based\_on\_grades

lowest\_numeric\_score\_metadata

Gets the metadata for the lowest numeric score.

Returns metadata for the lowest numeric score

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

lowest\_numeric\_score

#### numeric\_score\_increment\_metadata

Gets the metadata for the lowest numeric score.

Returns metadata for the lowest numeric score

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

#### numeric\_score\_increment

highest\_numeric\_score\_metadata

Gets the metadata for the highest numeric score.

Returns metadata for the highest numeric score

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

### highest\_numeric\_score

get\_grade\_system\_form\_record (grade\_system\_record\_type)
Gets the GradeSystemFormRecord corresponding to the given grade system record Type.

**Parameters grade\_system\_record\_type** (osid.type.Type) - the grade system record type

Returns the grade system form record

Return type osid.grading.records.GradeSystemFormRecord

**Raise** NullArgument - grade\_system\_record\_type is null

**Raise** OperationFailed – unable to complete request

Raise Unsupported - has\_record\_type(grade\_system\_record\_type) is
false

compliance: mandatory – This method must be implemented.

### **Grade System List**

```
class dlkit.grading.objects.GradeSystemList
```

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, GradeSystemList provides a means for accessing GradeSystem elements sequentially either one at a time or many at a time.

Examples: while (gsl.hasNext()) { GradeSystem system = gsl.getNextGradeSystem(); }

or

while (gsl.hasNext()) { GradeSystem[] systems = gsl.getNextGradeSystems(gsl.available());

}

### next\_grade\_system

Gets the next GradeSystem in this list.

**Returns** the next GradeSystem in this list. The has\_next() method should be used to test that a next GradeSystem is available before calling this method.

Return type osid.grading.GradeSystem

Raise IllegalState - no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

#### get\_next\_grade\_systems (n)

Gets the next set of GradeSystem elements in this list which must be less than or equal to the return from available().

- Parameters n (cardinal) the number of GradeSystem elements requested which must be less than or equal to available()
- **Returns** an array of GradeSystem elements. The length of the array is less than or equal to the number specified.

Return type osid.grading.GradeSystem

**Raise** IllegalState – no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

# **Grade Entry**

class dlkit.grading.objects.GradeEntry
Bases: dlkit.osid.objects.OsidRelationship

A GradeEntry represents an entry in a Gradebook.

### gradebook\_column\_id

Gets the Id of the GradebookColumn.

Returns the Id of the GradebookColumn

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

### $gradebook\_column$

Gets the GradebookColumn.

Returns the GradebookColumn

Return type osid.grading.GradebookColumn

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

### key\_resource\_id

Gets the Id of the key resource of this entry.

The key resource may be a student or other applicable key to identify a row of grading entries.

Returns Id of the key resource

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

### key\_resource

Gets the key resource of this entry.

The key resource may be a student or other applicable key to identify a row of grading entries.

Returns the key resource

Return type osid.resource.Resource

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

#### is\_derived()

Tests if this is a calculated entry.

**Returns** true if this entry is a calculated entry, false otherwise. If true, then overrides\_calculated\_entry() must be false.

Return type boolean

compliance: mandatory – This method must be implemented.

### overrides\_calculated\_entry()

Tests if this is a manual entry that overrides a calculated entry.

**Returns** true if this entry overrides a calculated entry, false otherwise. If true, then is\_derived() must be false.

Return type boolean

compliance: mandatory – This method must be implemented.

### overridden\_calculated\_entry\_id

Gets the calculated entry Id this entry overrides.

Returns the calculated entry Id

Return type osid.id.Id

**Raise** IllegalState - overrides\_derived\_entry() is false

compliance: mandatory – This method must be implemented.

#### overridden\_calculated\_entry

Gets the calculated entry this entry overrides.

**Returns** the calculated entry

Return type osid.grading.GradeEntry

Raise IllegalState - overrides\_calculated\_entry() is false

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

### is\_ignored\_for\_calculations()

Tests if this is entry should be ignored in any averaging, scaling or curve calculation.

**Returns** true if this entry is ignored, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### is\_graded()

Tests if a grade or score has been assigned to this entry.

Generally, an entry is created with a grade or score.

**Returns** true if a grade has been assigned, false otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

### grade\_id

Gets the grade Id in this entry if the grading system is based on grades.

Returns the grade Id

Return type osid.id.Id

**Raise** IllegalState - is\_graded() is false or GradeSystem. isBasedOnGrades() is false

compliance: mandatory – This method must be implemented.

#### grade

Gets the grade in this entry if the grading system is based on grades.

Returns the grade

Return type osid.grading.Grade

Raise IllegalState - is\_graded() is false or GradeSystem.
isBasedOnGrades() is false

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

#### score

Gets the score in this entry if the grading system is not based on grades.

**Returns** the score

Return type decimal

Raise IllegalState - is\_graded() is false or GradeSystem.
isBasedOnGrades() is true

compliance: mandatory – This method must be implemented.

#### time\_graded

Gets the time the gradeable object was graded.

Returns the timestamp of the grading entry

Return type osid.calendaring.DateTime

Raise IllegalState - is\_graded() is false or is\_derived() is true

compliance: mandatory – This method must be implemented.

### grader\_id

Gets the Id of the Resource that created this entry.

Returns the Id of the Resource

Return type osid.id.Id

Raise IllegalState - is\_graded() is false or is\_derived() is true

compliance: mandatory – This method must be implemented.

#### grader

Gets the Resource that created this entry.

Returns the Resource

Return type osid.resource.Resource

**Raise** IllegalState - is\_graded() is false or is\_derived() is true

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

#### grading\_agent\_id

Gets the Id of the Agent that created this entry.

Returns the Id of the Agent

Return type osid.id.Id

Raise IllegalState - is\_graded() is false or is\_derived() is true

compliance: mandatory – This method must be implemented.

#### grading\_agent

Gets the Agent that created this entry.

Returns the Agent

Return type osid.authentication.Agent

Raise IllegalState-is\_graded() is false or is\_derived() is true

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

### get\_grade\_entry\_record (grade\_entry\_record\_type)

Gets the grade entry record corresponding to the given GradeEntry record Type.

This method is used to retrieve an object implementing the requested record. The grade\_entry\_record\_type may be the Type returned in get\_record\_types() or any of its parents in a Type hierarchy where has\_record\_type(grade\_entry\_record\_type) is true.

Parameters grade\_entry\_record\_type (osid.type.Type) - the type of the record to retrieve

**Returns** the grade entry record

Return type osid.grading.records.GradeEntryRecord

**Raise** NullArgument - grade\_entry\_record\_type is null

**Raise** OperationFailed – unable to complete request

**Raise** Unsupported - has\_record\_type (grade\_entry\_record\_type) is false

compliance: mandatory – This method must be implemented.

### **Grade Entry Form**

class dlkit.grading.objects.GradeEntryForm

Bases: dlkit.osid.objects.OsidRelationshipForm

This is the form for creating and updating GradeEntries.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the GradeEntryAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

#### ignored\_for\_calculations\_metadata

Gets the metadata for the ignore flag.

**Returns** metadata for the ignore flag

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

#### ignored\_for\_calculations

#### grade\_metadata

Gets the metadata for a grade.

**Returns** metadata for the grade

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

### grade

#### score\_metadata

Gets the metadata for a score.

Returns metadata for the score

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

# score

#### get\_grade\_entry\_form\_record (grade\_entry\_record\_type)

Gets the GradeEntryFormRecord corresponding to the given grade entry record Type.

Parameters grade\_entry\_record\_type (osid.type.Type) - the grade entry record
 type

Returns the grade entry form record

Return type osid.grading.records.GradeEntryFormRecord

Raise NullArgument - grade\_entry\_record\_type is null

**Raise** OperationFailed – unable to complete request

**Raise** Unsupported - has\_record\_type (grade\_entry\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Grade Entry List**

### class dlkit.grading.objects.GradeEntryList

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, GradeEntryList provides a means for accessing GradeEntry elements sequentially either one at a time or many at a time.

Examples: while (gel.hasNext()) { GradeEntry entry = gel.getNextGradeEntry(); }

or

while (gel.hasNext()) { GradeEntry[] entries = gel.getNextGradeEntries(gel.available());

}

### next\_grade\_entry

Gets the next GradeEntry in this list.

**Returns** the next GradeEntry in this list. The has\_next() method should be used to test that a next GradeEntry is available before calling this method.

Return type osid.grading.GradeEntry

**Raise** IllegalState – no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

```
get_next_grade_entries(n)
```

Gets the next set of GradeEntry elements in this list which must be less than or equal to the number returned from available().

Parameters n (cardinal) - the number of GradeEntry elements requested which should be less than or equal to available()

**Returns** an array of GradeEntry elements. The length of the array is less than or equal to the number specified.

Return type osid.grading.GradeEntry

**Raise** IllegalState – no more elements available in this list

Raise OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

### **Gradebook Column**

class dlkit.grading.objects.GradebookColumn

Bases: dlkit.osid.objects.OsidObject

A GradebookColumn represents a series of grade entries in a gradebook.

Each GradeEntry in a column share the same GradeSystem.

### grade\_system\_id

Gets the GradeSystem Id in which this grade belongs.

**Returns** the grade system Id

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

### grade\_system

Gets the GradeSystem in which this grade belongs.

**Returns** the package grade system

Return type osid.grading.GradeSystem

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

### get\_gradebook\_column\_record (gradebook\_column\_record\_type)

Gets the gradebook column record corresponding to the given GradeBookColumn record Type.

This method ie used to retrieve an object implementing the requested record. The gradebook\_column\_record\_type may be the Type returned in get\_record\_types() or any of its parents in a Type hierarchy where has\_record\_type(gradebook\_column\_record\_type) is true.

Parameters gradebook\_column\_record\_type (osid.type.Type) - the type of the record to retrieve Returns the gradebook column record

Return type osid.grading.records.GradebookColumnRecord

Raise NullArgument - gradebook\_column\_record\_type is null

Raise OperationFailed - unable to complete request

Raise Unsupported - has\_record\_type(gradebook\_column\_record\_type) is
 false

compliance: mandatory – This method must be implemented.

# **Gradebook Column Form**

class dlkit.grading.objects.GradebookColumnForm Bases: dlkit.osid.objects.OsidObjectForm

This is the form for creating and updating GradebookColumns.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the GradebookAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

# grade\_system\_metadata

Gets the metadata for a grade system.

Returns metadata for the grade system

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

### grade\_system

# get\_gradebook\_column\_form\_record (gradebook\_column\_record\_type)

Gets the GradebookColumnFormRecord corresponding to the given gradebook column record Type.

Returns the gradebook column form record

Return type osid.grading.records.GradebookColumnFormRecord

**Raise** NullArgument - gradebook\_column\_record\_type is null

**Raise** OperationFailed – unable to complete request

Raise Unsupported - has\_record\_type(gradebook\_column\_record\_type) is
 false

compliance: mandatory – This method must be implemented.

# **Gradebook Column List**

class dlkit.grading.objects.GradebookColumnList

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, GradebookColumnList provides a means for accessing GradebookColumn elements sequentially either one at a time or many at a time.

Examples: while (gcl.hasNext()) { GradebookColumn column = gcl.getNextGradebookColumn(); }

or

while (gcl.hasNext()) { GradebookColumn[] columns = gcl.getNextGradebookColumns(gcl.available());

}

### next\_gradebook\_column

Gets the next GradebookColumn in this list.

**Returns** the next GradebookColumn in this list. The has\_next() method should be used to test that a next GradebookColumn is available before calling this method.

Return type osid.grading.GradebookColumn

**Raise** IllegalState – no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory - This method must be implemented.

### get\_next\_gradebook\_columns (n)

Gets the next set of GradebookColumn elements in this list which must be less than or equal to the return from available().

**Parameters n** (cardinal) – the number of GradebookColumn elements requested which must be less than or equal to available ()

**Returns** an array of GradebookColumn elements. The length of the array is less than or equal to the number specified.

Return type osid.grading.GradebookColumn

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

### **Gradebook Column Summary**

 $class \verb+dlkit.grading.objects.GradebookColumnSummary+$ 

Bases: dlkit.osid.objects.OsidObject

A GradebookColumnSummary is a summary of all entries within a gradebook column.

### gradebook\_column\_id

Gets the Id of the GradebookColumn.

Returns the Id of the GradebookColumn

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### gradebook\_column

Gets the GradebookColumn.

Returns the GradebookColumn

Return type osid.grading.GradebookColumn

Raise OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

### mean

Gets the mean score.

If this system is based on grades, the mean output score is returned.

**Returns** the mean score

Return type decimal

compliance: mandatory – This method must be implemented.

# median

Gets the median score.

If this system is based on grades, the mean output score is returned.

**Returns** the median score

Return type decimal

compliance: mandatory – This method must be implemented.

#### mode

Gets the mode of the score.

If this system is based on grades, the mode of the output score is returned.

**Returns** the median score

Return type decimal

compliance: mandatory – This method must be implemented.

#### rms

Gets the root mean square of the score.

If this system is based on grades, the RMS of the output score is returned.

**Returns** the median score

Return type decimal

compliance: mandatory – This method must be implemented.

### standard\_deviation

Gets the standard deviation.

If this system is based on grades, the spread of the output scores is returned.

Returns the standard deviation

Return type decimal

compliance: mandatory – This method must be implemented.

### sum

Gets the sum of the scores.

If this system is based on grades, the sum of the output scores is returned.

**Returns** the median score

Return type decimal

compliance: mandatory – This method must be implemented.

get\_gradebook\_column\_summary\_record (gradebook\_column\_summary\_record\_type)
Gets the gradebook column summary record corresponding to the given GradebookColumnSummary
record Type.

This method is used to retrieve an object implementing the requested record. The gradebook\_column\_summary\_record\_type may be the Type returned in get record types() or any of its parents in a Type hierarchy where has\_record\_type(gradebook\_column\_summary\_record\_type) is true.

**Parameters gradebook\_column\_summary\_record\_type** (osid.type.Type) - the type of the record to retrieve

**Returns** the gradebook column summary record

Return type osid.grading.records.GradebookColumnSummaryRecord

Raise NullArgument - gradebook\_column\_summary\_record\_type is null

**Raise** OperationFailed – unable to complete request

Raise Unsupported-has\_record\_type(gradebook\_column\_summary\_record\_type)
is false

compliance: mandatory – This method must be implemented.

## Gradebook

:noindex:

#### get\_gradebook\_record(gradebook\_record\_type)

Gets the gradebook record corresponding to the given Gradebook record Type.

This method is used to retrieve an object implementing the requested record. The gradebook\_record\_type may be the Type returned in get\_record\_types() or any of its parents in a Type hierarchy where has\_record\_type(gradebook\_record\_type) is true.

**Parameters** gradebook\_record\_type (osid.type.Type) - a gradebook record type

Returns the gradebook record

Return type osid.grading.records.GradebookRecord

Raise NullArgument - gradebook\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type (gradebook\_record\_type) is false

compliance: mandatory – This method must be implemented.

# **Gradebook Form**

class dlkit.grading.objects.GradebookForm
 Bases: dlkit.osid.objects.OsidCatalogForm

This is the form for creating and updating Gradebooks.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the GradebookAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

get\_gradebook\_form\_record (gradebook\_record\_type)

Gets the GradebookFormRecord corresponding to the given gradebook record Type.

Parameters gradebook\_record\_type (osid.type.Type) - a gradebook record type

Returns the gradebook form record

Return type osid.grading.records.GradebookFormRecord

**Raise** NullArgument - gradebook\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type (gradebook\_record\_type) is false

compliance: mandatory – This method must be implemented.

# **Gradebook List**

class dlkit.grading.objects.GradebookList

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, GradebookList provides a means for accessing Gradebook elements sequentially either one at a time or many at a time.

Examples: while (gl.hasNext()) { Gradebook gradebook = gl.getNextGradebook(); }

or

while (gl.hasNext()) { Gradebook[] gradebooks = gl.getNextGradebooks(gl.available());

# }

### next\_gradebook

Gets the next Gradebook in this list.

**Returns** the next Gradebook in this list. The has\_next() method should be used to test that a next Gradebook is available before calling this method.

Return type osid.grading.Gradebook

Raise IllegalState - no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

get\_next\_gradebooks(n)

Gets the next set of Gradebook elements in this list which must be less than or equal to the return from available().

**Parameters n** (cardinal) – the number of Gradebook elements requested which must be less than or equal to available()

**Returns** an array of Gradebook elements. The length of the array is less than or equal to the number specified.

Return type osid.grading.Gradebook

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

# **Gradebook Node**

class dlkit.grading.objects.GradebookNode

Bases: dlkit.osid.objects.OsidNode

This interface is a container for a partial hierarchy retrieval.

The number of hierarchy levels traversable through this interface depend on the number of levels requested in the GradebookHierarchySession.

### gradebook

Gets the Gradebook at this node.

Returns the gradebook represented by this node

Return type osid.grading.Gradebook

compliance: mandatory – This method must be implemented.

#### parent\_gradebook\_nodes

Gets the parents of this gradebook.

**Returns** the parents of the id

Return type osid.grading.GradebookNodeList

compliance: mandatory – This method must be implemented.

### child\_gradebook\_nodes

Gets the children of this gradebook.

**Returns** the children of this gradebook

Return type osid.grading.GradebookNodeList

compliance: mandatory – This method must be implemented.

# **Gradebook Node List**

```
class dlkit.grading.objects.GradebookNodeList
```

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, GradebookNodeList provides a means for accessing GradebookNode elements sequentially either one at a time or many at a time.

Examples: while (gnl.hasNext()) { GradebookNode node = gnl.getNextGradebookNode(); }

#### or

while (gnl.hasNext()) { GradebookNode[] nodes = gnl.getNextGradebookNodes(gnl.available());

### }

### next\_gradebook\_node

Gets the next GradebookNode in this list.

**Returns** the next GradebookNode in this list. The has\_next() method should be used to test that a next GradebookNode is available before calling this method.

Return type osid.grading.GradebookNode

**Raise** IllegalState – no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

#### get\_next\_gradebook\_nodes (n)

Gets the next set of GradebookNode elements in this list which must be less than or equal to the return from available().

- **Parameters n** (cardinal) the number of GradebookNode elements requested which must be less than or equal to available ()
- **Returns** an array of GradebookNode elements. The length of the array is less than or equal to the number specified.

Return type osid.grading.GradebookNode

**Raise** IllegalState – no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

# Queries

### **Grade Query**

```
class dlkit.grading.queries.GradeQuery
```

```
Bases: dlkit.osid.queries.OsidObjectQuery,
OsidSubjugateableQuery
```

dlkit.osid.queries.

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This is the query for searching gradings.

Each method match request produces an AND term while multiple invocations of a method produces a nested OR.

match\_grade\_system\_id (grade\_system\_id, match)
Sets the grade system Id for this query.

# Parameters

• grade\_system\_id (osid.id.Id) - a grade system Id

• match (boolean) - true for a positive match, false for negative match

**Raise** NullArgument - grade\_system\_id is null

compliance: mandatory – This method must be implemented.

#### grade\_system\_id\_terms

### supports\_grade\_system\_query()

Tests if a GradeSystemQuery is available for querying grade systems.

**Returns** true if a grade system query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### grade\_system\_query

Gets the query for a grade system.

Multiple retrievals produce a nested OR term.

Returns the grade system query

Return type osid.grading.GradeSystemQuery

**Raise** Unimplemented - supports\_grade\_system\_query() is false

compliance: optional – This method must be implemented if ''supports\_grade\_system\_query()'' is ''true''.

### grade\_system\_terms

match\_input\_score\_start\_range (start, end, match)
Matches grades with the start input score inclusive.

atomos grudos with the start input set

# Parameters

- **start** (decimal) start of range
- end (decimal) end of range
- match (boolean) true for a positive match, false for negative match

**Raise** InvalidArgument - start is greater than end

compliance: mandatory – This method must be implemented.

# input\_score\_start\_range\_terms

#### match\_input\_score\_end\_range (start, end, match)

Matches grades with the end input score inclusive.

#### Parameters

- start (decimal) start of range
- end (decimal) end of range
- match (boolean) true for a positive match, false for negative match

Raise InvalidArgument - start is greater than end

compliance: mandatory – This method must be implemented.

#### input\_score\_end\_range\_terms

# match\_input\_score (start, end, match)

Matches grades with the input score range contained within the given range inclusive.

### Parameters

- start (decimal) start of range
- end (decimal) end of range
- match (boolean) true for a positive match, false for negative match

Raise InvalidArgument - start is greater than end

compliance: mandatory – This method must be implemented.

#### input\_score\_terms

#### match\_output\_score (start, end, match)

Matches grades with the output score contained within the given range inclusive.

### Parameters

- start (decimal) start of range
- end (decimal) end of range
- match (boolean) true for a positive match, false for negative match

**Raise** InvalidArgument - start is greater than end

compliance: mandatory – This method must be implemented.

### output\_score\_terms

**match\_grade\_entry\_id** (*grade\_entry\_id*, *match*) Sets the grade entry Id for this query.

#### **Parameters**

• grade\_entry\_id (osid.id.Id) - a grade entry Id

• match (boolean) - true for a positive match, false for negative match

**Raise** NullArgument - grade\_entry\_id is null

compliance: mandatory – This method must be implemented.

#### grade\_entry\_id\_terms

#### supports\_grade\_entry\_query()

Tests if a GradeEntryQuery is available for querying grade entries.

**Returns** true if a grade entry query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### grade\_entry\_query

Gets the query for a grade entry.

Multiple retrievals produce a nested OR term.

Returns the grade entry query

Return type osid.grading.GradeEntryQuery

**Raise** Unimplemented - supports\_grade\_entry\_query() is false

compliance: optional – This method must be implemented if "supports\_grade\_entry\_query()" is "true".

### match\_any\_grade\_entry(match)

Matches grades that are assigned to any grade entry.

**Parameters match** (boolean) – true to match grades used in any grade entry, false to match grades that are not used in any grade entries

compliance: mandatory – This method must be implemented.

#### grade\_entry\_terms

match\_gradebook\_id (gradebook\_id, match)
 Sets the gradebook Id for this query.

**D** (

# Parameters

- gradebook\_id (osid.id.Id) a gradebook Id
- match (boolean) true for a positive match, false for negative match

Raise NullArgument - gradebook\_id is null

compliance: mandatory – This method must be implemented.

#### gradebook\_id\_terms

#### supports\_gradebook\_query()

Tests if a GradebookQuery is available.

**Returns** true if a gradebook query is available, false otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

### gradebook query

Gets the query for a gradebook.

Multiple retrievals produce a nested OR term.

**Returns** the gradebook query

**Return type** osid.grading.GradebookQuery

Raise Unimplemented - supports\_gradebook\_query() is false

compliance: optional – This method must be implemented if "supports\_gradebook\_column\_query()" is "true".

#### gradebook terms

### get\_grade\_query\_record (grade\_record\_type)

Gets the grade query record corresponding to the given Grade record Type.

Multiple retrievals produce a nested OR term.

**Parameters grade\_record\_type** (osid.type.Type) - a grade record type

Returns the grade query record

Return type osid.grading.records.GradeQueryRecord

**Raise** NullArgument - grade\_record\_type is null

**Raise** OperationFailed – unable to complete request

**Raise** Unsupported - has\_record\_type (grade\_record\_type) is false

compliance: mandatory – This method must be implemented.

# **Grade System Query**

class dlkit.grading.queries.GradeSystemQuery

```
Bases:
             dlkit.osid.queries.OsidObjectQuery, dlkit.osid.queries.
OsidAggregateableQuery
```

This is the query for searching grade systems.

Each method match request produces an AND term while multiple invocations of a method produces a nested OR.

#### match\_based\_on\_grades(match)

Matches grade systems based on grades.

Parameters match (boolean) - true for a positive match, false for negative match

compliance: mandatory – This method must be implemented.

#### based\_on\_grades\_terms

match\_grade\_id(grade\_id, match) Sets the grade Id for this query.

#### **Parameters**

- grade\_id (osid.id.Id) a grade Id
- match (boolean) true for a positive match, false for negative match

Raise NullArgument - grade\_id is null

compliance: mandatory – This method must be implemented.

### grade\_id\_terms

### supports\_grade\_query()

Tests if a GradeQuery is available for querying grades.

**Returns** true if a grade query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### grade\_query

Gets the query for a grade.

Multiple retrievals produce a nested OR term.

Returns the grade query

Return type osid.grading.GradeQuery

Raise Unimplemented - supports\_grade\_query() is false

compliance: optional – This method must be implemented if "supports\_grade\_query()" is "true".

### match\_any\_grade (match)

Matches grade systems with any grade.

**Parameters match** (boolean) – true to match grade systems with any grade, false to match systems with no grade

compliance: mandatory – This method must be implemented.

### grade\_terms

#### match\_lowest\_numeric\_score (start, end, match)

Matches grade systems whose low end score falls in the specified range inclusive.

### Parameters

- start (decimal) low end of range
- end (decimal) high end of range
- match (boolean) true for a positive match, false for negative match

Raise InvalidArgument - end is less than start

**Raise** NullArgument - grade\_id is null

compliance: mandatory – This method must be implemented.

#### lowest\_numeric\_score\_terms

#### match\_numeric\_score\_increment (start, end, match)

Matches grade systems numeric score increment is between the specified range inclusive.

#### Parameters

• **start** (decimal) - low end of range

- end (decimal) high end of range
- match (boolean) true for a positive match, false for negative match

Raise InvalidArgument - end is less than start

**Raise** NullArgument - grade\_id is null

compliance: mandatory – This method must be implemented.

#### numeric\_score\_increment\_terms

#### match\_highest\_numeric\_score (start, end, match)

Matches grade systems whose high end score falls in the specified range inclusive.

#### Parameters

- start (decimal) low end of range
- end (decimal) high end of range
- match (boolean) true for a positive match, false for negative match

Raise InvalidArgument - end is less than start

**Raise** NullArgument - grade\_id is null

compliance: mandatory – This method must be implemented.

#### highest\_numeric\_score\_terms

match\_gradebook\_column\_id (gradebook\_column\_id, match)
Sets the gradebook column Id for this query.

#### **Parameters**

- gradebook\_column\_id (osid.id.Id) a gradebook column Id
- match (boolean) true for a positive match, false for negative match
- Raise NullArgument gradebook\_column\_id is null

compliance: mandatory – This method must be implemented.

#### gradebook\_column\_id\_terms

#### supports\_gradebook\_column\_query()

Tests if a GradebookColumnQuery is available.

Returns true if a gradebook column query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### gradebook\_column\_query

Gets the query for a gradebook column.

Multiple retrievals produce a nested OR term.

Returns the gradebook column query

Return type osid.grading.GradebookColumnQuery

Raise Unimplemented - supports\_gradebook\_column\_query() is false

compliance: optional – This method must be implemented if 'supports\_gradebook\_column\_query()'' is ''true''.

match\_any\_gradebook\_column (match)

Matches grade systems assigned to any gradebook column.

**Parameters match** (boolean) – true to match grade systems mapped to any column, false to match systems mapped to no columns

compliance: mandatory – This method must be implemented.

#### gradebook\_column\_terms

match\_gradebook\_id (gradebook\_id, match)
 Sets the gradebook Id for this query.

Parameters

• gradebook\_id (osid.id.Id) - a gradebook Id

• match (boolean) - true for a positive match, false for negative match

**Raise** NullArgument - gradebook\_id is null

compliance: mandatory – This method must be implemented.

#### gradebook\_id\_terms

supports\_gradebook\_query()

Tests if a GradebookQuery is available.

Returns true if a gradebook query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# gradebook\_query

Gets the query for a gradebook.

Multiple retrievals produce a nested OR term.

**Returns** the gradebook query

Return type osid.grading.GradebookQuery

Raise Unimplemented - supports\_gradebook\_query() is false

compliance: optional – This method must be implemented if "supports\_gradebook\_query()" is "true".

### gradebook\_terms

#### get\_grade\_system\_query\_record (grade\_system\_record\_type)

Gets the grade system query record corresponding to the given GradeSystem record Type.

Multiple retrievals produce a nested OR term.

Parameters grade\_system\_record\_type(osid.type.Type)-a grade system record
 type

Returns the grade system query record

Return type osid.grading.records.GradeSystemQueryRecord

**Raise** NullArgument - grade\_system\_record\_type is null

Raise OperationFailed - unable to complete request

Raise Unsupported - has\_record\_type(grade\_system\_record\_type) is
false

compliance: mandatory – This method must be implemented.

# **Grade Entry Query**

class dlkit.grading.queries.GradeEntryQuery

Bases: dlkit.osid.queries.OsidRelationshipQuery

This is the query for searching grade entries.

Each method match request produces an AND term while multiple invocations of a method produces a nested OR.

match\_gradebook\_column\_id (gradebook\_column\_id, match)

Sets the gradebook column Id for this query.

#### **Parameters**

- gradebook\_column\_id (osid.id.Id) a gradebook column Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - gradebook\_column\_id is null

*compliance: mandatory – This method must be implemented.* 

#### gradebook\_column\_id\_terms

### supports\_gradebook\_column\_query()

Tests if a GradebookColumnQuery is available for querying creators.

**Returns** true if a gradebook column query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### gradebook\_column\_query

Gets the query for a gradebook column.

Multiple retrievals produce a nested OR term.

Returns the gradebook column query

Return type osid.grading.GradebookColumnQuery

Raise Unimplemented - supports\_gradebook\_column\_query() is false

compliance: optional – This method must be implemented if ''supports\_gradebook\_column\_query()'' is ''true''.

# gradebook\_column\_terms

match\_key\_resource\_id(resource\_id, match)

Sets the key resource Id for this query.

#### **Parameters**

- resource\_id (osid.id.Id) a resource Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - resource\_id is null

compliance: mandatory – This method must be implemented.

### key\_resource\_id\_terms

### supports\_key\_resource\_query()

Tests if a ResourceQUery is available for querying key resources.

**Returns** true if a resource query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# key\_resource\_query

Gets the query for a key resource.

Multiple retrievals produce a nested OR term.

Returns the resource query

Return type osid.resource.ResourceQuery

**Raise** Unimplemented - supports\_key\_resource\_query() is false

compliance: optional – This method must be implemented if ''supports\_key\_resource\_query()'' is ''true''.

#### match\_any\_key\_resource(match)

Matches grade entries with any key resource.

**Parameters match** (boolean) – true to match grade entries with any key resource, false to match entries with no key resource

compliance: mandatory – This method must be implemented.

# key\_resource\_terms

**match\_derived** (*match*) Matches derived grade entries.

**Parameters match** (boolean) – true to match derived grade entries , false to match manual entries

compliance: mandatory – This method must be implemented.

#### derived\_terms

match\_overridden\_grade\_entry\_id(grade\_entry\_id, match)

Sets the grade entry Id for an overridden calculated grade entry.

#### **Parameters**

- grade\_entry\_id (osid.id.Id) a grade entry Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - grade\_entry\_id is null

compliance: mandatory – This method must be implemented.

### overridden\_grade\_entry\_id\_terms

# supports\_overridden\_grade\_entry\_query()

Tests if a GradeEntry is available for querying overridden calculated grade entries.

**Returns** true if a grade entry query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### overridden\_grade\_entry\_query

Gets the query for an overridden derived grade entry.

Multiple retrievals produce a nested OR term.

**Returns** the grade entry query

Return type osid.grading.GradeEntryQuery

Raise Unimplemented - supports\_overridden\_grade\_entry\_query() is
false

compliance: optional – This method must be implemented if 'supports\_overridden\_grade\_entry\_query()'' is ''true''.

#### match\_any\_overridden\_grade\_entry(match)

Matches grade entries overriding any calculated grade entry.

**Parameters match** (boolean) – true to match grade entries overriding any grade entry, false to match entries not overriding any entry

compliance: mandatory – This method must be implemented.

#### overridden\_grade\_entry\_terms

### match\_ignored\_for\_calculations(match)

Matches grade entries ignored for calculations.

**Parameters match** (boolean) - true to match grade entries ignored for calculations, false to match entries used in calculations

compliance: mandatory – This method must be implemented.

# ignored\_for\_calculations\_terms

match\_grade\_id (grade\_id, match)

Sets the grade Id for this query.

### Parameters

- grade\_id (osid.id.Id) a grade Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - grade\_id is null

compliance: mandatory – This method must be implemented.

# grade\_id\_terms

### supports\_grade\_query()

Tests if a GradeQuery is available for querying grades.

**Returns** true if a grade query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### grade\_query

Gets the query for a grade.

Multiple retrievals produce a nested OR term.

Returns the grade query

Return type osid.grading.GradeQuery

Raise Unimplemented - supports\_grade\_query() is false

compliance: optional – This method must be implemented if "supports\_grade\_query()" is "true".

#### match\_any\_grade(match)

Matches grade entries with any grade.

**Parameters match** (boolean) – true to match grade entries with any grade, false to match entries with no grade

compliance: mandatory – This method must be implemented.

### grade\_terms

```
match_score (start, end, match)
```

Matches grade entries which score is between the specified score inclusive.

#### **Parameters**

- start (decimal) start of range
- end (decimal) end of range
- match (boolean) true for a positive match, false for a negative match

Raise InvalidArgument - end is less than start

compliance: mandatory – This method must be implemented.

### match\_any\_score (match)

Matches grade entries with any score.

**Parameters match** (boolean) – true to match grade entries with any score, false to match entries with no score

compliance: mandatory – This method must be implemented.

#### score\_terms

match\_time\_graded(start, end, match)

Matches grade entries which graded time is between the specified times inclusive.

#### **Parameters**

- start (osid.calendaring.DateTime) start of range
- end (osid.calendaring.DateTime) end of range
- match (boolean) true for a positive match, false for a negative match

Raise InvalidArgument - end is less than start

compliance: mandatory – This method must be implemented.

### time\_graded\_terms

#### match\_grader\_id(resource\_id, match)

Sets the agent Id for this query.

### **Parameters**

- resource\_id (osid.id.Id) a resource Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - resource\_id is null

compliance: mandatory – This method must be implemented.

#### grader\_id\_terms

#### supports\_grader\_query()

Tests if a ResourceQuery is available for querying graders.

Returns true if a resource query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### grader\_query

Gets the query for an agent.

Multiple retrievals produce a nested OR term.

**Returns** the resource query

Return type osid.resource.ResourceQuery

Raise Unimplemented - supports\_resource\_query() is false

compliance: optional – This method must be implemented if ''supports\_resource\_query()'' is ''true''.

#### match\_any\_grader(match)

Matches grade entries with any grader.

**Parameters match** (boolean) – true to match grade entries with any grader, false to match entries with no grader

compliance: mandatory – This method must be implemented.

# grader\_terms

match\_grading\_agent\_id (agent\_id, match)
Sets the grading agent Id for this query.

#### **Parameters**

- agent\_id (osid.id.Id) an agent Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - agent\_id is null

compliance: mandatory – This method must be implemented.

#### grading\_agent\_id\_terms

### supports\_grading\_agent\_query()

Tests if an AgentQuery is available for querying grading agents.

**Returns** true if an agent query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### grading\_agent\_query

Gets the query for an agent.

Multiple retrievals produce a nested OR term.

**Returns** the agent query

Return type osid.authentication.AgentQuery

Raise Unimplemented - supports\_grading\_agent\_query() is false

compliance: optional – This method must be implemented if ''supports\_grading\_agent\_query()'' is ''true''.

# match\_any\_grading\_agent(match)

Matches grade entries with any grading agent.

**Parameters match** (boolean) – true to match grade entries with any grading agent, false to match entries with no grading agent

compliance: mandatory – This method must be implemented.

### grading\_agent\_terms

match\_gradebook\_id (gradebook\_id, match)
Sets the gradebook Id for this query.

#### **Parameters**

- gradebook\_id (osid.id.Id) a gradebook Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - gradebook\_id is null

compliance: mandatory – This method must be implemented.

# gradebook\_id\_terms

#### supports\_gradebook\_query()

Tests if a GradebookQuery is available for querying resources.

**Returns** true if a gradebook query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### gradebook\_query

Gets the query for a gradebook.

Multiple retrievals produce a nested OR term.

**Returns** the gradebook query

Return type osid.grading.GradebookQuery

Raise Unimplemented - supports\_gradebook\_query() is false

compliance: optional – This method must be implemented if ''supports\_gradebook\_query()'' is ''true''.

#### gradebook\_terms

#### get\_grade\_entry\_query\_record (grade\_entry\_record\_type)

Gets the grade entry query record corresponding to the given GradeEntry record Type.

Multiple retrievals produce a nested OR term.

Parameters grade\_entry\_record\_type (osid.type.Type) - a grade entry record
 type

Returns the grade entry query record

Return type osid.grading.records.GradeEntryQueryRecord

**Raise** NullArgument - grade\_entry\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported-has\_record\_type(grade\_entry\_record\_type) is false

compliance: mandatory – This method must be implemented.

### **Gradebook Column Query**

class dlkit.grading.queries.GradebookColumnQuery Bases: dlkit.osid.queries.OsidObjectQuery

This is the query for searching gradings.

Each method match request produces an AND term while multiple invocations of a method produces a nested OR.

match\_grade\_system\_id(grade\_system\_id, match)

Sets the grade system Id for this query.

**Parameters** 

- grade\_system\_id (osid.id.Id) a grade system Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - grade\_system\_id is null

compliance: mandatory – This method must be implemented.

#### grade\_system\_id\_terms

### supports\_grade\_system\_query()

Tests if a GradeSystemQuery is available for querying grade systems.

**Returns** true if a grade system query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### grade\_system\_query

Gets the query for a grade system.

Multiple retrievals produce a nested OR term.

**Returns** the grade system query

Return type osid.grading.GradeSystemQuery

Raise Unimplemented - supports\_grade\_system\_query() is false

compliance: optional – This method must be implemented if "supports\_grade\_system\_query()" is "true".

### match\_any\_grade\_system(match)

Matches gradebook columns with any grade system assigned.

**Parameters match** (boolean) – true to match columns with any grade system, false to match columns with no grade system

compliance: mandatory – This method must be implemented.

### grade\_system\_terms

match\_grade\_entry\_id (grade\_entry\_id, match)
 Sets the grade entry Id for this query.

**Parameters** 

- grade\_entry\_id (osid.id.Id) a grade entry Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - grade\_entry\_id is null

compliance: mandatory – This method must be implemented.

#### grade\_entry\_id\_terms

### supports\_grade\_entry\_query()

Tests if a GradeEntryQuery is available for querying grade entries.

**Returns** true if a grade entry query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### grade\_entry\_query

Gets the query for a grade entry.

Multiple retrievals produce a nested OR term.

Returns the grade entry query

Return type osid.grading.GradeEntryQuery

**Raise** Unimplemented - supports\_grade\_entry\_query() is false

compliance: optional – This method must be implemented if ''supports\_grade\_entry\_query()'' is ''true''.

### match\_any\_grade\_entry(match)

Matches gradebook columns with any grade entry assigned.

**Parameters match** (boolean) – true to match columns with any grade entry, false to match columns with no grade entries

compliance: mandatory – This method must be implemented.

### grade\_entry\_terms

#### supports\_gradebook\_column\_summary\_query()

Tests if a GradebookColumnSummaryQuery is available for querying grade systems.

Returns true if a gradebook column summary query interface is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# gradebook\_column\_summary\_query

Gets the query interface for a gradebook column summary.

Multiple retrievals produce a nested OR term.

**Returns** the gradebook column summary query

Return type osid.grading.GradebookColumnSummaryQuery

Raise Unimplemented - supports\_gradebook\_column\_summary\_query() is
false

compliance: optional – This method must be implemented if 'supports\_gradebook\_column\_summary\_query()' is 'true''.

#### gradebook\_column\_summary\_terms

match\_gradebook\_id (gradebook\_id, match)
Sets the gradebook Id for this query.

#### **Parameters**

• gradebook\_id (osid.id.Id) - a gradebook Id

• match (boolean) - true for a positive match, false for a negative match

**Raise** NullArgument – gradebook\_id is null

compliance: mandatory – This method must be implemented.

### gradebook\_id\_terms

#### supports\_gradebook\_query()

Tests if a GradebookQuery is available for querying grade systems.

**Returns** true if a gradebook query interface is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### gradebook\_query

Gets the query interface for a gradebook.

Multiple retrievals produce a nested OR term.

Returns the gradebook query

Return type osid.grading.GradebookQuery

Raise Unimplemented - supports\_gradebook\_query() is false

compliance: optional – This method must be implemented if ''supports\_gradebook\_query()'' is ''true''.

### gradebook\_terms

#### get\_gradebook\_column\_query\_record(gradebook\_column\_record\_type)

Gets the gradebook column query record corresponding to the given GradebookColumn record Type.

Multiple retrievals produce a nested OR term.

**Parameters gradebook\_column\_record\_type** (osid.type.Type) - a gradebook column record type

Returns the gradebook column query record

Return type osid.grading.records.GradebookColumnQueryRecord

**Raise** NullArgument - gradebook\_column\_record\_type is null

**Raise** OperationFailed – unable to complete request

Raise Unsupported - has\_record\_type(gradebook\_column\_record\_type) is
false

*compliance: mandatory – This method must be implemented.* 

# Gradebook Column Summary Query

class dlkit.grading.queries.GradebookColumnSummaryQuery Bases: dlkit.osid.queries.OsidRuleQuery

This is the query for searching gradebook column summaries.

Each method match request produces an AND term while multiple invocations of a method produces a nested OR.

match\_gradebook\_column\_id (gradebook\_column\_id, match)
Sets the gradebook column Id for this query.

**Parameters** 

• gradebook\_column\_id (osid.id.Id) - a gradeboo column Id

• match (boolean) - true for a positive match, false for a negative match

Raise NullArgument - gradebook\_column\_id is null

compliance: mandatory – This method must be implemented.

#### gradebook\_column\_id\_terms

#### supports\_gradebook\_column\_query()

Tests if a GradebookColumnQuery is available for querying gradebook column.

**Returns** true if a gradebook column query is available, false otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

#### gradebook\_column\_query

Gets the query for a gradebook column.

Multiple retrievals produce a nested OR term.

**Returns** the gradebook column query

Return type osid.grading.GradebookColumnQuery

Raise Unimplemented - supports\_gradebook\_column\_query() is false

compliance: optional – This method must be implemented if "supports\_gradebook\_column\_query()" is "true".

#### match\_any\_gradebook\_column (match)

Matches gradebook column derivations with any gradebookc olumn.

Parameters match (boolean) - true to match gradebook column derivations with any
gradebook column, false to match gradebook column derivations with no gradebook
columns

compliance: mandatory – This method must be implemented.

### gradebook\_column\_terms

### match\_mean (low, high, match)

Matches a mean between the given values inclusive.

#### **Parameters**

- low (decimal) low end of range
- high (decimal) high end of range
- match (boolean) true for a positive match, false for a negative match

Raise InvalidArgument - low is greater than high

compliance: mandatory – This method must be implemented.

### mean\_terms

#### match\_minimum\_mean (value, match)

Matches a mean greater than or equal to the given value.

### Parameters

- value (decimal) minimum value
- match (boolean) true for a positive match, false for a negative match

compliance: mandatory – This method must be implemented.

#### minimum\_mean\_terms

match\_median (low, high, match)

Matches a median between the given values inclusive.

#### **Parameters**

- low (decimal) low end of range
- high (decimal) high end of range
- match (boolean) true for a positive match, false for a negative match

**Raise** InvalidArgument - low is greater than high

compliance: mandatory – This method must be implemented.

### median\_terms

#### match\_minimum\_median(value, match)

Matches a median greater than or equal to the given value.

#### Parameters

- value (decimal) minimum value
- match (boolean) true for a positive match, false for a negative match

compliance: mandatory – This method must be implemented.

#### minimum\_median\_terms

#### match\_mode (low, high, match)

Matches a mode between the given values inclusive.

#### **Parameters**

- low (decimal) low end of range
- high (decimal) high end of range
- match (boolean) true for a positive match, false for a negative match

**Raise** InvalidArgument – low is greater than high

compliance: mandatory – This method must be implemented.

#### mode\_terms

match\_minimum\_mode (value, match)

Matches a mode greater than or equal to the given value.

#### Parameters

- value (decimal) minimum value
- match (boolean) true for a positive match, false for a negative match

compliance: mandatory – This method must be implemented.

#### minimum\_mode\_terms

#### match\_rms (low, high, match)

Matches a root mean square between the given values inclusive.

### Parameters

• low (decimal) - low end of range

- high (decimal) high end of range
- match (boolean) true for a positive match, false for a negative match

Raise InvalidArgument - low is greater than high

compliance: mandatory – This method must be implemented.

#### rms\_terms

#### match\_minimum\_rms(value, match)

Matches a root mean square greater than or equal to the given value.

### Parameters

- value (decimal) minimum value
- match (boolean) true for a positive match, false for a negative match

compliance: mandatory – This method must be implemented.

#### minimum\_rms\_terms

match\_standard\_deviation(low, high, match)

Matches a standard deviation mean square between the given values inclusive.

#### **Parameters**

- low (decimal) low end of range
- high (decimal) high end of range
- match (boolean) true for a positive match, false for a negative match

**Raise** InvalidArgument – low is greater than high

compliance: mandatory – This method must be implemented.

#### standard\_deviation\_terms

#### match\_minimum\_standard\_deviation(value, match)

Matches a standard deviation greater than or equal to the given value.

#### **Parameters**

- value (decimal) minimum value
- match (boolean) true for a positive match, false for a negative match

compliance: mandatory – This method must be implemented.

### minimum\_standard\_deviation\_terms

match\_sum(low, high, match)

Matches a sum mean square between the given values inclusive.

### Parameters

- low (decimal) low end of range
- high (decimal) high end of range
- match (boolean) true for a positive match, false for a negative match

**Raise** InvalidArgument - low is greater than high

compliance: mandatory – This method must be implemented.

#### sum\_terms

match\_minimum\_sum(value, match)

Matches a sum greater than or equal to the given value.

#### **Parameters**

- value (decimal) minimum value
- match (boolean) true for a positive match, false for a negative match

compliance: mandatory – This method must be implemented.

#### minimum\_sum\_terms

match\_gradebook\_id (gradebook\_id, match)
Sets the gradebook Id for this query.

# Parameters

- ar annetter 5
  - gradebook\_id (osid.id.Id) a gradebook Id
  - match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument – gradebook\_id is null

compliance: mandatory – This method must be implemented.

### gradebook\_id\_terms

#### supports\_gradebook\_query()

Tests if a GradebookQuery is available.

**Returns** true if a gradebook query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### gradebook\_query

Gets the query for a gradebook.

Multiple retrievals produce a nested OR term.

Returns the gradebook query

Return type osid.grading.GradebookQuery

**Raise** Unimplemented - supports\_gradebook\_query() is false

compliance: optional – This method must be implemented if ''supports\_gradebook\_column\_query()'' is ''true''.

#### gradebook\_terms

get\_gradebook\_column\_summary\_query\_record(gradebook\_column\_summary\_record\_type)

Gets the gradebook column summary query record corresponding to the given GradebookColumnSummary record Type.

Multiple retrievals produce a nested OR term.

**Parameters gradebook\_column\_summary\_record\_type** (osid.type.Type) - a gradebook column summary record type

Returns the gradebook column summary query record

Return type osid.grading.records.GradebookColumnSummaryQueryRecord

**Raise** NullArgument - gradebook\_column\_summary\_record\_type is null

**Raise** OperationFailed – unable to complete request

Raise Unsupported-has\_record\_type(gradebook\_column\_summary\_record\_type)
is false

compliance: mandatory – This method must be implemented.

### **Gradebook Query**

class dlkit.grading.queries.GradebookQuery
Bases: dlkit.osid.queries.OsidCatalogQuery

This is the query for searching gradebooks.

Each method specifies an AND term while multiple invocations of the same method produce a nested OR.

match\_grade\_system\_id (grade\_system\_id, match)
Sets the grade system Id for this query.

#### **Parameters**

- grade\_system\_id (osid.id.Id) a grade system Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - grade\_system\_id is null

compliance: mandatory – This method must be implemented.

#### grade\_system\_id\_terms

#### supports\_grade\_system\_query()

Tests if a GradeSystemQuery is available.

**Returns** true if a grade system query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### grade\_system\_query

Gets the query for a grade system.

Multiple retrievals produce a nested OR term.

Returns the grade system query

Return type osid.grading.GradeSystemQuery

Raise Unimplemented - supports\_grade\_system\_query() is false

compliance: optional – This method must be implemented if ''supports\_grade\_system\_query()'' is ''true''.

#### match\_any\_grade\_system(match)

Matches gradebooks that have any grade system.

**Parameters match** (boolean) – true to match gradebooks with any grade system, false to match gradebooks with no grade system

compliance: mandatory – This method must be implemented.

#### grade\_system\_terms

# 

Sets the grade entry Id for this query.

### Parameters

• grade\_entry\_id (osid.id.Id) - a grade entry Id

• match (boolean) - true for a positive match, false for a negative match

**Raise** NullArgument - grade\_entry\_id is null

compliance: mandatory – This method must be implemented.

### grade\_entry\_id\_terms

#### supports\_grade\_entry\_query()

Tests if a GradeEntryQuery is available.

**Returns** true if a grade entry query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### grade\_entry\_query

Gets the query for a grade entry.

Multiple retrievals produce a nested OR term.

Returns the grade entry query

Return type osid.grading.GradeEntryQuery

Raise Unimplemented - supports\_grade\_entry\_query() is false

compliance: optional – This method must be implemented if ''supports\_grade\_entry\_query()'' is ''true''.

### match\_any\_grade\_entry(match)

Matches gradebooks that have any grade entry.

**Parameters match** (boolean) – true to match gradebooks with any grade entry, false to match gradebooks with no grade entry

compliance: mandatory – This method must be implemented.

### grade\_entry\_terms

match\_gradebook\_column\_id (gradebook\_column\_id, match)
Sets the gradebook column Id for this query.

#### **Parameters**

- gradebook\_column\_id (osid.id.Id) a gradebook column Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - gradebook\_column\_id is null

*compliance: mandatory – This method must be implemented.* 

#### gradebook\_column\_id\_terms

#### supports\_gradebook\_column\_query()

Tests if a GradebookColumnQuery is available.

**Returns** true if a gradebook column query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### gradebook\_column\_query

Gets the query for a gradebook column.

Multiple retrievals produce a nested OR term.

Returns the gradebook column query

Return type osid.grading.GradebookColumnQuery

Raise Unimplemented - supports\_gradebook\_column\_query() is false

compliance: optional – This method must be implemented if ''supports\_gradebook\_column\_query()'' is ''true''.

### match\_any\_gradebook\_column (match)

Matches gradebooks that have any column.

**Parameters match** (boolean) – true to match gradebooks with any column, false to match gradebooks with no column

compliance: mandatory – This method must be implemented.

#### gradebook\_column\_terms

#### match\_ancestor\_gradebook\_id (gradebook\_id, match)

Sets the gradebook Id for this query to match gradebooks that have the specified gradebook as an ancestor.

#### **Parameters**

- gradebook\_id (osid.id.Id) a gradebook Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - gradebook\_id is null

compliance: mandatory – This method must be implemented.

### ancestor\_gradebook\_id\_terms

supports\_ancestor\_gradebook\_query()

Tests if a GradebookQuery is available.

**Returns** true if a gradebook query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### ancestor\_gradebook\_query

Gets the query for a gradebook.

Multiple retrievals produce a nested OR term.

Returns the gradebook query

Return type osid.grading.GradebookQuery

Raise Unimplemented - supports\_ancestor\_gradebook\_query() is false

compliance: optional – This method must be implemented if ''supports\_ancestor\_gradebook\_query()'' is ''true''.

#### match\_any\_ancestor\_gradebook (match)

Matches gradebook with any ancestor.

**Parameters match** (boolean) – true to match gradebooks with any ancestor, false to match root gradebooks

compliance: mandatory – This method must be implemented.

#### ancestor\_gradebook\_terms

#### match\_descendant\_gradebook\_id (gradebook\_id, match)

Sets the gradebook Id for this query to match gradebooks that have the specified gradebook as a descendant.

### **Parameters**

- gradebook\_id (osid.id.Id) a gradebook Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - gradebook\_id is null

compliance: mandatory – This method must be implemented.

#### descendant\_gradebook\_id\_terms

#### supports\_descendant\_gradebook\_query()

Tests if a GradebookQuery is available.

**Returns** true if a gradebook query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## ${\tt descendant\_gradebook\_query}$

Gets the query for a gradebook.

Multiple retrievals produce a nested OR term.

Returns the gradebook query

Return type osid.grading.GradebookQuery

Raise Unimplemented - supports\_descendant\_gradebook\_query() is false

compliance: optional – This method must be implemented if "supports\_descendant\_gradebook\_query()" is "true".

#### match\_any\_descendant\_gradebook (match)

Matches gradebook with any descendant.

**Parameters match** (boolean) - true to match gradebooks with any descendant, false to match leaf gradebooks

compliance: mandatory – This method must be implemented.

### descendant\_gradebook\_terms

#### get\_gradebook\_query\_record (gradebook\_record\_type)

Gets the gradebook query record corresponding to the given Gradebook record Type.

Multiple record retrievals produce a nested OR term.

Parameters gradebook\_record\_type (osid.type.Type) - a gradebook record type

Returns the gradebook query record

Return type osid.grading.records.GradebookQueryRecord

**Raise** NullArgument - gradebook\_record\_type is null

Raise OperationFailed - unable to complete request

Raise Unsupported - has\_record\_type (gradebook\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Records**

## **Grade Record**

class dlkit.grading.records.GradeRecord Bases: dlkit.osid.records.OsidRecord

A record for a Grade.

The methods specified by the record type are available through the underlying object.

### **Grade Query Record**

```
class dlkit.grading.records.GradeQueryRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for a GradeQuery.

The methods specified by the record type are available through the underlying object.

## **Grade Form Record**

```
class dlkit.grading.records.GradeFormRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for a GradeForm.

The methods specified by the record type are available through the underlying object.

### **Grade System Record**

```
class dlkit.grading.records.GradeSystemRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for a GradeSystem.

The methods specified by the record type are available through the underlying object.

### **Grade System Query Record**

class dlkit.grading.records.GradeSystemQueryRecord Bases: dlkit.osid.records.OsidRecord

A record for a GradeSystemQuery.

The methods specified by the record type are available through the underlying object.

### Grade System Form Record

```
class dlkit.grading.records.GradeSystemFormRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for a GradeSystemForm.

The methods specified by the record type are available through the underlying object.

### **Grade System Search Record**

class dlkit.grading.records.GradeSystemSearchRecord Bases: dlkit.osid.records.OsidRecord

A record for a  ${\tt GradeSystemSearch}.$ 

The methods specified by the record type are available through the underlying object.

### **Grade Entry Record**

```
class dlkit.grading.records.GradeEntryRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for a GradeEntry.

The methods specified by the record type are available through the underlying object.

### **Grade Entry Query Record**

```
class dlkit.grading.records.GradeEntryQueryRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for a GradeEntryQuery.

The methods specified by the record type are available through the underlying object.

### **Grade Entry Form Record**

class dlkit.grading.records.GradeEntryFormRecord Bases: dlkit.osid.records.OsidRecord

A record for a GradeEntryForm.

The methods specified by the record type are available through the underlying object.

### **Grade Entry Search Record**

class dlkit.grading.records.GradeEntrySearchRecord

Bases: dlkit.osid.records.OsidRecord

A record for a GradeEntrySearch.

The methods specified by the record type are available through the underlying object.

## **Gradebook Column Record**

class dlkit.grading.records.GradebookColumnRecord Bases: dlkit.osid.records.OsidRecord

A record for a GradebookColumn.

The methods specified by the record type are available through the underlying object.

### **Gradebook Column Query Record**

class dlkit.grading.records.GradebookColumnQueryRecord Bases: dlkit.osid.records.OsidRecord

A record for a GradebookColumnQuery.

The methods specified by the record type are available through the underlying object.

### **Gradebook Column Form Record**

class dlkit.grading.records.GradebookColumnFormRecord Bases: dlkit.osid.records.OsidRecord

A record for a GradebookColumnForm.

The methods specified by the record type are available through the underlying object.

## **Gradebook Column Search Record**

```
class dlkit.grading.records.GradebookColumnSearchRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for a  ${\tt GradebookColumnSearch}.$ 

The methods specified by the record type are available through the underlying object.

### **Gradebook Column Summary Record**

class dlkit.grading.records.GradebookColumnSummaryRecord Bases: dlkit.osid.records.OsidRecord

A record for a GradebookColumnSummary.

The methods specified by the record type are available through the underlying object.

### Gradebook Column Summary Query Record

class dlkit.grading.records.GradebookColumnSummaryQueryRecord Bases: dlkit.osid.records.OsidRecord

A record for a GradebookColumnSummaryQuery.

The methods specified by the record type are available through the underlying object.

### **Gradebook Record**

class dlkit.grading.records.GradebookRecord Bases: dlkit.osid.records.OsidRecord

A record for a Gradebook.

The methods specified by the record type are available through the underlying object.

## **Gradebook Query Record**

class dlkit.grading.records.GradebookQueryRecord Bases: dlkit.osid.records.OsidRecord

A record for a GradebookQuery.

The methods specified by the record type are available through the underlying object.

## **Gradebook Form Record**

```
class dlkit.grading.records.GradebookFormRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for a GradebookForm.

The methods specified by the record type are available through the underlying object.

## **Gradebook Search Record**

```
class dlkit.grading.records.GradebookSearchRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for a GradebookSearch.

The methods specified by the record type are available through the underlying object.

# Hierarchy

## Summary

Hierarchy Open Service Interface Definitions hierarchy version 3.0.0

The Hierarchy OSID is an auxiliary service providing a means for accessing and managing hierarchical relationships among OSID Ids.

An OSID Id may have onr or more parents or children and the hierarchy itself represents a directed acyclic graph. The hierarchy service defines a set of interfaces used among other OSIDs that utilize hierarchies and can also be used to abstract hierarchical data into a standalone service.

Hierarchical queries may be performed using the HierarchyTraversalSession. A set of methods exist to query parents, children, ancestors, and decendants. A Node structure may be retrieved to access a portion of a hierarchy in bulk. The Node provides methods to get parents and children of the node directly.

Hierarchies are federateable by combining nodes. There is no hierarchy service for the hierarchy catalog. Hierarchy Open Service Interface Definitions hierarchy version 3.0.0

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## Service Managers

### **Hierarchy Profile**

```
class dlkit.services.hierarchy.HierarchyProfile
Bases: dlkit.osid.managers.OsidProfile
```

The hierarchy profile describes the interoperability among hierarchy services.

#### supports\_hierarchy\_traversal()

Tests if hierarchy traversal is supported.

**Returns** true if hierarchy traversal is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_hierarchy\_design()

Tests if hierarchy design is supported.

**Returns** true if hierarchy design is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_hierarchy\_lookup()

Tests if a hierarchy lookup is supported.

**Returns** true if hierarchy lookup is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_hierarchy\_admin()

Tests if a hierarchy administration is supported.

**Returns** true if hierarchy administration is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### hierarchy\_record\_types

Gets the supported Hierarchy types.

**Returns** a list containing the supported Hierarchy record types

Return type osid.type.TypeList

*compliance: mandatory – This method must be implemented.* 

### hierarchy\_search\_record\_types

Gets the supported Hierarchy search record types.

Returns a list containing the supported Hierarchy search record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

### **Hierarchy Manager**

class dlkit.services.hierarchy.HierarchyManager(proxy=None)

Bases: dlkit.osid.managers.OsidManager, dlkit.osid.sessions.OsidSession, dlkit.services.hierarchy.HierarchyProfile

The hierarchy manager provides access sessions to traverse and manage hierarchies of Ids.

The sessions included in this manager are:

•HierarchyTraversalSession: a basic session traversing a hierarchy

•HierarchyDesignSession: a session to design a hierarchy

•HierarchySequencingSession: a session to sequence nodes in a hierarchy

•HierarchyStructureNotificationSession: a session for notififcations within a hierarchy structure

•HierarchyLookupSession: a session looking up hiererachies

•HierarchyQuerySession: a session querying hiererachies

•HierarchySearchSession: a session for searching for hierarchies

•HierarchyAdminSession: a session for creating and deleting hierarchies

•HierarchyNotificationSession: a session for subscribing to changes in hierarchies

### **Hierarchy Traversal Methods**

HierarchyManager.hierarchy\_id

Gets the hierarchy Id associated with this session.

Returns the hierarchy Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

HierarchyManager.hierarchy

Gets the hierarchy associated with this session.

Returns the hierarchy associated with this session

Return type osid.hierarchy.Hierarchy

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### HierarchyManager.can\_access\_hierarchy()

Tests if this user can perform hierarchy queries.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations.

**Returns** false if lookup methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### HierarchyManager.roots

Gets the root nodes of this hierarchy.

**Returns** the root nodes

Return type osid.id.IdList

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## HierarchyManager.has\_parents(id\_)

Tests if this Id contains any parents.

Parameters id (osid.id.Id) - the Id to query

Returns true if this Id contains parents, false otherwise

Return type boolean

Raise NotFound - id is not found

Raise NullArgument - id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

### HierarchyManager.is\_parent(id\_, parent\_id)

Tests if an Id is a direct parent of another.

### **Parameters**

- id (osid.id.Id) the Id to query
- parent\_id (osid.id.Id) the Id of a parent

**Returns** true if this parent\_id is a parent of id, false otherwise

Return type boolean

Raise NotFound - id is not found

**Raise** NullArgument - id or parent\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented. implementation notes*: If parent\_id not found return false.

## HierarchyManager.get\_parents(id\_)

Gets the parents of the given id.

Parameters id (osid.id.Id) - the Id to query

Returns the parents of the id

Return type osid.id.IdList

 $Raise \;\; \texttt{NotFound-id} \; is \; not \; found$ 

Raise NullArgument - id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

HierarchyManager.is\_ancestor(id\_, ancestor\_id)

Tests if an Id is an ancestor of another.

#### **Parameters**

- id (osid.id.Id) the Id to query
- ancestor\_id (osid.id.Id) the Id of an ancestor

Returns true if this ancestor\_id is a parent of id, false otherwise

Return type boolean

Raise NotFound - id is not found

Raise NullArgument - id or ancestor\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory* – *This method must be implemented. implementation notes:* If ancestor\_id not found return false.

#### HierarchyManager.has\_children(id\_)

Tests if this Id has any children.

Parameters id (osid.id.Id) - the Id to query

Returns true if this Id has children, false otherwise

Return type boolean

Raise NotFound - id is not found

Raise NullArgument - id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

HierarchyManager.is\_child(id\_, child\_id)

Tests if a node is a direct child of another.

### Parameters

- id (osid.id.Id) the Id to query
- child\_id (osid.id.Id) the Id of a child

Returns true if this child\_id is a child of the Id, false otherwise

Return type boolean

Raise NotFound - id is not found

**Raise** NullArgument - id or child\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented. implementation notes:* If child\_id not found return false.

HierarchyManager.get\_children (*id\_*) Gets the children of the given Id.

Parameters id (osid.id.Id) - the Id to query

Returns the children of the id

Return type osid.id.IdList

**Raise** NotFound – id is not found

 $Raise \; \text{NullArgument} - \text{id} \; is \; \text{null}$ 

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

HierarchyManager.is\_descendant(id\_, descendant\_id)

Tests if a node is a descendant of another.

### Parameters

- id (osid.id.Id) the Id to query
- descendant\_id (osid.id.Id) the Id of a descendant

Returns true if this descendant\_id is a child of the Id, false otherwise

Return type boolean

 $Raise \; \texttt{NotFound}-\texttt{id} \; is \; not \; found$ 

Raise NullArgument - id or descendant is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented. implementation notes:* If not found return false.

HierarchyManager.get\_nodes (id\_, ancestor\_levels, descendant\_levels, include\_siblings)
Gets a portion of the hierarchy for the given Id.

#### **Parameters**

- id (osid.id.Id) the Id to query
- **ancestor\_levels** (cardinal) the maximum number of ancestor levels to include. A value of 0 returns no parents in the node.
- **descendant\_levels** (cardinal) the maximum number of descendant levels to include. A value of 0 returns no children in the node.
- **include\_siblings** (boolean) true to include the siblings of the given node, false to omit the siblings

Returns a node

Return type osid.hierarchy.Node

 $Raise \; \texttt{NotFound}-\texttt{id} \; is \; not \; found$ 

Raise NullArgument - id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

### **Hierarchy Design Methods**

```
HierarchyManager.hierarchy_id
```

Gets the hierarchy Id associated with this session.

Returns the hierarchy Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### HierarchyManager.hierarchy

Gets the hierarchy associated with this session.

Returns the hierarchy associated with this session

Return type osid.hierarchy.Hierarchy

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

### HierarchyManager.can\_modify\_hierarchy()

Tests if this user can change the hierarchy.

A return of true does not guarantee successful authorization. A return of false indicates that it is known performing any update will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer these operations to an unauthorized user.

Returns false if changing this hierarchy is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
HierarchyManager.add_root(id_)
```

Adds a root node.

Parameters id (osid.id.Id) - the Id of the node

Raise AlreadyExists - id is already in hierarchy

Raise NotFound - id not found

Raise NullArgument - id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

HierarchyManager.add\_child(id\_, child\_id)

Adds a child to a Id.

### Parameters

- id (osid.id.Id) the Id of the node
- child\_id (osid.id.Id) the Id of the new child

Raise AlreadyExists - child\_id is already a child of id

Raise NotFound - id or child\_id not found

Raise NullArgument - id or child\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

### HierarchyManager.remove\_root (id\_)

Removes a root node.

Parameters id (osid.id.Id) - the Id of the node

Raise NotFound - id was not found or not in hierarchy

Raise NullArgument - id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

```
HierarchyManager.remove_child(id_, child_id)
```

Removes a childfrom an Id.

#### **Parameters**

- id (osid.id.Id) the Id of the node
- child\_id (osid.id.Id) the Id of the child to remove

Raise NotFound - id or child\_id was not found or child\_id is not a child of id

Raise NullArgument - id or child\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

### HierarchyManager.remove\_children(id\_)

Removes all childrenfrom an Id.

Parameters id (osid.id.Id) - the Id of the node

Raise NotFound - an node identified by the given Id was not found

Raise NullArgument - id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

### **Hierarchy Lookup Methods**

```
HierarchyManager.can_lookup_hierarchies()
Tests if this user can perform Hierarchy lookups.
```

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

Returns false if lookup methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### HierarchyManager.use\_comparative\_hierarchy\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

```
HierarchyManager.use_plenary_hierarchy_view()
```

A complete view of the Hierarchy returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

```
HierarchyManager.get_hierarchy(hierarchy_id)
```

Gets the Hierarchy specified by its Id.

In plenary mode, the exact Id is found or a NotFound results. Otherwise, the returned Hierarchy may have a different Id than requested, such as the case where a duplicate Id was assigned to a Hierarchy and retained for compati

Parameters hierarchy\_id (osid.id.Id) - the Id of the Hierarchy to retrieve

Returns the returned Hierarchy

**Return type** osid.hierarchy.Hierarchy

Raise NotFound - no Hierarchy found with the given Id

**Raise** NullArgument - hierarchy\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

HierarchyManager.get\_hierarchies\_by\_ids(hierarchy\_ids)

Gets a Hierarchy corresponding to the given IdList.

In plenary mode, the returned list contains all of the hierarchies specified in the Id list, in the order of the list, including duplicates, or an error results if an Id in the supplied list is not found or inaccessible. Otherwise, inaccessible Hierarchy objects may be omitted from the list and may present the elements in any order including returning a unique set.

Parameters hierarchy\_ids (osid.id.IdList) - the list of Ids to retrieve

Returns the returned Hierarchy list

Return type osid.hierarchy.HierarchyList

Raise NotFound - an Id was not found

**Raise** NullArgument - hierarchy\_ids is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

HierarchyManager.get\_hierarchies\_by\_genus\_type (hierarchy\_genus\_type)

Gets a HierarchyList corresponding to the given genus Type which does not include hierarchies of types derived from the specified Type.

In plenary mode, the returned list contains all known hierarchies or an error results. Otherwise, the returned list may contain only those hierarchies that are accessible through this session.

Parameters hierarchy\_genus\_type (osid.type.Type) - a hierarchy genus
type

**Returns the returned** Hierarchy list

Return type osid.hierarchy.HierarchyList

Raise NullArgument - hierarchy\_genus\_type is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

HierarchyManager.get\_hierarchies\_by\_parent\_genus\_type (hierarchy\_genus\_type)
Gets a HierarchyList corresponding to the given hierarchy genus Type and include any additional hierarchies with types derived from the specified Type.

In plenary mode, the returned list contains all known hierarchies or an error results. Otherwise, the returned list may contain only those hierarchies that are accessible through this session.

Parameters hierarchy\_genus\_type (osid.type.Type) - a hierarchy genus
type

Returns the returned Hierarchy list

Return type osid.hierarchy.HierarchyList

Raise NullArgument - hierarchy\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

HierarchyManager.get\_hierarchies\_by\_record\_type (*hierarchy\_record\_type*) Gets a HierarchyList corresponding to the given hierarchy record Type.

The set of hierarchies implementing the given record type are returned. In plenary mode, the returned list contains all known hierarchies or an error results. Otherwise, the returned list may contain only those hierarchies that are accessible through this session.

Parameters hierarchy\_record\_type (osid.type.Type) - a hierarchy record
type

Returns the returned Hierarchy list

Return type osid.hierarchy.HierarchyList

Raise NullArgument - hierarchy\_record\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

HierarchyManager.get\_hierarchies\_by\_provider (resource\_id)
Gets a HierarchyList for the given provider "".

The set of hierarchies implementing the given record type are returned. In plenary mode, the returned list contains all known hierarchies or an error results. Otherwise, the returned list may contain only those hierarchies that are accessible through this session.

Parameters resource\_id (osid.id.Id) - a resource Id

Returns the returned Hierarchy list

Return type osid.hierarchy.HierarchyList

**Raise** NullArgument - resource\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

HierarchyManager.hierarchies Gets all hierarchies.

In plenary mode, the returned list contains all known hierarchies or an error results. Otherwise, the returned list may contain only those hierarchies that are accessible through this session.

**Returns** a list of Hierarchies

Return type osid.hierarchy.HierarchyList

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### **Hierarchy Admin Methods**

```
HierarchyManager.can_create_hierarchies()
```

Tests if this user can create Hierarchy objects.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating a Hierarchy will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer create operations to unauthorized users.

Returns false if Hierarchy creation is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

HierarchyManager.can\_create\_hierarchy\_with\_record\_types (*hierarchy\_record\_types*) Tests if this user can create a single Hierarchy using the desired record types.

While HierarchyManager.getHierarchyRecordTypes() can be used to examine which records are supported, this method tests which record(s) are required for creating a specific Hierarchy. Providing an empty array tests if a Hierarchy can be created with no records.

Parameters hierarchy\_record\_types(osid.type.Type[]) - array of hierarchy record types **Returns** true if Hierarchy creation using the specified Types is supported, false otherwise

Return type boolean

Raise NullArgument - hierarchy\_record\_types is null

compliance: mandatory – This method must be implemented.

HierarchyManager.get\_hierarchy\_form\_for\_create(hierarchy\_record\_types)
Gets the hierarchy form for creating new hierarchies.

A new form should be requested for each create transaction. This method is used for creating new hierarchies, where only the Hierarchy Type is known.

**Parameters hierarchy\_record\_types** (osid.type.Type[]) - array of hierarchy record types

**Returns** the hierarchy form

Return type osid.hierarchy.HierarchyForm

Raise NullArgument - hierarchy\_record\_types is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

Raise Unsupported – unable to get form for requested record types

compliance: mandatory – This method must be implemented.

```
HierarchyManager.create_hierarchy(hierarchy_form)
```

Creates a new Hierarchy.

Parameters hierarchy\_form (osid.hierarchy.HierarchyForm) - the form
 for this Hierarchy

**Returns** the new Hierarchy

Return type osid.hierarchy.Hierarchy

Raise IllegalState - hierarchy\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

**Raise** NullArgument - hierarchy\_form is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported - hierarchy\_form did not originate from
 get\_hierarchy\_form\_for\_create()

compliance: mandatory – This method must be implemented.

#### HierarchyManager.can\_update\_hierarchies()

Tests if this user can update Hierarchy objects.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating a Hierarchy will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer update operations to unauthorized users.

Returns false if Hierarchy modification is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

HierarchyManager.get\_hierarchy\_form\_for\_update (*hierarchy\_id*) Gets the hierarchy form for updating an existing hierarchy.

A new hierarchy form should be requested for each update transaction.

Parameters hierarchy\_id (osid.id.Id) - the Id of the Hierarchy

**Returns** the hierarchy form

Return type osid.hierarchy.HierarchyForm

**Raise** NotFound - hierarchy\_id is not found

**Raise** NullArgument - hierarchy\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

HierarchyManager.update\_hierarchy(hierarchy\_form)
Updates on ovisiting hierarchy

Updates an existing hierarchy.

**Parameters hierarchy\_form** (osid.hierarchy.HierarchyForm) – the form containing the elements to be updated

Raise IllegalState - hierarchy\_form already used in an update transaction

**Raise** InvalidArgument – the form contains an invalid value

Raise NullArgument - hierarchy\_id or hierarchy\_form is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

Raise Unsupported - hierarchy\_form did not originate from
 get\_hierarchy\_form\_for\_update()

compliance: mandatory – This method must be implemented.

#### HierarchyManager.can\_delete\_hierarchies()

Tests if this user can delete Hierarchy objects.

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting a Hierarchy will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer delete operations to unauthorized users.

Returns false if Hierarchy deletion is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

HierarchyManager.delete\_hierarchy(hierarchy\_id)

Deletes a Hierarchy.

Parameters hierarchy\_id (osid.id.Id) - the Id of the Hierarchy to remove

**Raise** NotFound - hierarchy\_id not found

**Raise** NullArgument - hierarchy\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

HierarchyManager.can\_manage\_hierarchy\_aliases()

Tests if this user can manage Id aliases for Hierarchy objects.

A return of true does not guarantee successful authorization. A return of false indicates that it is known changing an alias will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer alias operations to an unauthorized user.

**Returns** false if Hierarchy aliasing is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

HierarchyManager.alias\_hierarchy (hierarchy\_id, alias\_id)
Adds an Id to a Hierarchy for the purpose of creating compatibility.

The primary Id of the Hierarchy is determined by the provider. The new Id performs as an alias to the primary Id. If the alias is a pointer to another vault it is reassigned to the given vault Id.

#### Parameters

- hierarchy\_id (osid.id.Id) the Id of an Hierarchy
- alias\_id (osid.id.Id) the alias Id

Raise AlreadyExists - alias\_id is already assigned

Raise NotFound-hierarchy\_id not found

Raise NullArgument - hierarchy\_id or alias\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

### **Hierarchy**

#### Hierarchy

class dlkit.services.hierarchy.Hierarchy(provider\_manager, catalog, runtime, proxy,

\*\*kwargs)

Bases: dlkit.osid.objects.OsidCatalog, dlkit.osid.sessions.OsidSession

A Hierarchy represents an authenticatable identity.

Like all OSID objects, a Hierarchy is identified by its Id and any persisted references should use the Id.

```
get_hierarchy_record (hierarchy_record_type)
```

Gets the hierarchy record corresponding to the given Hierarchy record Type.

This method is used to retrieve an object implementing the requested record. The hierarchy\_record\_type may be the Type returned in get\_record\_types() or any of its parents in a Type hierarchy where has\_record\_type (hierarchy\_record\_type) is true.

**Parameters hierarchy\_record\_type** (osid.type.Type) - the type of the record to retrieve

Returns the hierarchy record

Return type osid.hierarchy.records.HierarchyRecord

**Raise** NullArgument - hierarchy\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type (hierarchyrecord\_type) is false

compliance: mandatory – This method must be implemented.

## **Objects**

### Hierarchy

### :noindex:

get\_hierarchy\_record (hierarchy\_record\_type)
Gets the hierarchy record corresponding to the given Hierarchy record Type.

This method is used to retrieve an object implementing the requested record. The hierarchy\_record\_type may be the Type returned in get\_record\_types() or any of its parents in a Type hierarchy where has\_record\_type (hierarchy\_record\_type) is true.

**Parameters hierarchy\_record\_type** (osid.type.Type) - the type of the record to retrieve

Returns the hierarchy record

Return type osid.hierarchy.records.HierarchyRecord

**Raise** NullArgument - hierarchy\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type (hierarchyrecord\_type) is false

compliance: mandatory – This method must be implemented.

### **Hierarchy Form**

class dlkit.hierarchy.objects.HierarchyForm

Bases: dlkit.osid.objects.OsidCatalogForm

This is the form for creating and updating Hierarchy objects.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the HierarchyAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

```
get_hierarchy_form_record(hierarchy_record_type)
```

Gets the HierarchyFormRecord corresponding to the given hierarchy record Type.

Parameters hierarchy\_record\_type (osid.type.Type) - the hierarchy record type

Returns the hierarchy form record

Return type osid.hierarchy.records.HierarchyFormRecord

Raise NullArgument - hierarchy\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported – has\_record\_type (hierarchy\_record\_type) is false compliance: mandatory – This method must be implemented.

### **Hierarchy List**

class dlkit.hierarchy.objects.HierarchyList

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, HierarchyList provides a means for accessing Id elements sequentially either one at a time or many at a time.

Examples: while (hl.hasNext()) { Hierarchy hierarchy = hl.getNextHierarchy(); }

or

while (hl.hasNext()) { Hierarchy[] hierarchies = hl.getNextHierarchies(hl.available());

}

#### next\_hierarchy

Gets the next Hierarchy in this list.

**Returns** the next Hierarchy in this list. The has\_next() method should be used to test that a next Hierarchy is available before calling this method.

Return type osid.hierarchy.Hierarchy

**Raise** IllegalState – no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

#### get\_next\_hierarchies(n)

Gets the next set of Hierarchy objects in this list.

The specified amount must be less than or equal to the return from available ().

- **Parameters n** (cardinal) the number of Hierarchy elements requested which must be less than or equal to available()
- **Returns** an array of Hierarchy elements. The length of the array is less than or equal to the number specified.

Return type osid.hierarchy.Hierarchy

Raise IllegalState - no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

#### Node

class dlkit.hierarchy.objects.Node

Bases: dlkit.osid.objects.OsidNode

This interface is a container for a partial hierarchy retrieval.

The number of hierarchy levels traversable through this interface depend on the number of levels requested in the hierarchy traversal session.

### parents

Gets the parents of this node.

**Returns** the parents of this node

Return type osid.hierarchy.NodeList

compliance: mandatory – This method must be implemented.

### children

Gets the children of this node.

Returns the children of this node

Return type osid.hierarchy.NodeList

compliance: mandatory – This method must be implemented.

## **Node List**

```
class dlkit.hierarchy.objects.NodeList
```

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, NodeList provides a means for accessing Id elements sequentially either one at a time or many at a time.

Examples: while (nl.hasNext()) { Node node = nl.getNextNode(); }

or

```
while (nl.hasNext()) { Node[] nodes = nl.getNextNodes(nl.available());
```

}

#### next\_node

Gets the next Node in this list.

**Returns** the next Node in this list. The has\_next () method should be used to test that a next Node is available before calling this method.

Return type osid.hierarchy.Node

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

#### get\_next\_nodes (n)

Gets the next set of Node objects in this list.

The specified amount must be less than or equal to the return from available ().

- **Parameters n** (cardinal) the number of Node elements requested which must be less than or equal to available ()
- **Returns** an array of Node elements. The length of the array is less than or equal to the number specified.

Return type osid.hierarchy.Node

**Raise** IllegalState – no more elements available in this list

Raise OperationFailed – unable to complete request

compliance: mandatory - This method must be implemented.

## Queries

### **Hierarchy Query**

class dlkit.hierarchy.queries.HierarchyQuery
Bases: dlkit.osid.queries.OsidCatalogQuery

This is the query for searching hierarchies.

Results are returned if all the specified elements match. Each method match request produces an AND term while multiple invocations of a method produces a nested OR, except for accessing the HierarchyQuery record.

```
match_node_id(id_, match)
```

Matches an Id of a node in this hierarchy.

Multiple nodes can be added to this query which behave as a boolean AND.

#### **Parameters**

- id (osid.id.Id) Id to match
- match (boolean) true if a positive match, false for negative match

Raise NullArgument - id is null

compliance: mandatory – This method must be implemented.

### match\_any\_node\_id(match)

Matches hierarchies with any node.

**Parameters match** (boolean) – true to match hierarchies with any nodes, false to match hierarchies with no nodes

compliance: mandatory – This method must be implemented.

### node\_id\_terms

### get\_hierarchy\_query\_record (hierarchy\_record\_type)

Gets the hierarchy record query corresponding to the given Hierarchy record Type.

Multiple record retrievals of the same type may return the same underlying object and do not result in adding terms to the query. Multiple record retrievals of different types add AND terms to the other elements set in this form.

**Parameters hierarchy\_record\_type** (osid.type.Type) - a hierarchy record type

**Returns** the hierarchy query record

Return type osid.hierarchy.records.HierarchyQueryRecord

**Raise** NullArgument - hierarchy\_record\_type is null

**Raise** OperationFailed – unable to complete request

**Raise** Unsupported - has\_record\_type (hierarchy\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Records**

## **Hierarchy Record**

class dlkit.hierarchy.records.HierarchyRecord Bases: dlkit.osid.records.OsidRecord

A record for a Hierarchy.

The methods specified by the record type are available through the underlying object.

## **Hierarchy Query Record**

```
class dlkit.hierarchy.records.HierarchyQueryRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for a HierarchyQuery.

The methods specified by the record type are available through the underlying object.

## **Hierarchy Form Record**

```
class dlkit.hierarchy.records.HierarchyFormRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for a HierarchyForm.

The methods specified by the record type are available through the underlying object.

## **Hierarchy Search Record**

```
class dlkit.hierarchy.records.HierarchySearchRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for a HierarchySearch.

The methods specified by the record type are available through the underlying object.

# Learning

## Summary

Learning Open Service Interface Definitions learning version 3.0.0

The Learning OSID manages learning objectives. A learning Objective describes measurable learning goals.

Objectives

Objectives describe measurable learning goals. A learning objective may be measured by a related Assessment. Objectives may be mapped to levels, A level is represented by a Grade which is used to indicate a grade level or level of difficulty.

Objectives are hierarchical. An Objective with children represents an objective that is inclusive of all its children. For example, an Objective that represents learning in arithmetic may be composed of objectives that represent learning in both addition and subtraction.

Objectives may also have requisites. A requisite objective is one that should be achieved before an objective is attempted.

### Activities

An Activity describes actions that one can do to meet a learning objective. An Activity includes a list of Assets to read or watch, or a list of Courses to take, or a list of learning Assessments to practice. An Activity may also represent other learning activities such as taking a course or practicing an instrument. An Activity is specific to an Objective where the reusability is achieved based on what the Activity relates.

### Proficiencies

A Proficiency is an OsidRelationship measuring the competence of a Resource with respect to an Objective.

### **Objective Bank Cataloging**

Objectives, Activities, and Proficiencies can be organized into hierarchical ObjectiveBanks for the purposes of categorization and federation.

### **Concept Mapping**

A concept can be modeled as a learning Objective without any related Assessment or Activities. In this scenario, an Objective looks much like the simpler Subject in the Ontology OSID. The Ontology OSID is constrained to qualifying concepts while the relations found in an Objective allow for the quantification of the learning concept and providing paths to self-learning.

The Topology OSID may also be used to construct and view a concept map. While a Topology OSID Provider may be adapted from a Learning OSID or an Ontology OSID, the topology for either would be interpreted from a multi-parented hierarchy of the Objectives and Subjects respectively.

### Courses

The Learning OSID may be used in conjunction with the Course OSID to identify disred learning oitcomes from a course or to align the course activities and syllabus with stated learning objectives. The Course OSID describes learning from a structured curriculum management point of view where the Learning OSID and allows for various objectives to be combined and related without any regard to a prescribed curriculum.

### Sub Packages

The Learning OSID contains a Learning Batch OSID for bulk management of Objectives, Activities, and Proficiencies. Learning Open Service Interface Definitions learning version 3.0.0

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### Sub Packages

The Learning OSID contains a Learning Batch OSID for bulk management of Objectives, Activities, and Proficiencies.

## **Service Managers**

### **Learning Profile**

```
class dlkit.services.learning.LearningProfile
```

Bases: dlkit.osid.managers.OsidProfile

The LearningProfile describes the interoperability among learning services.

### supports\_objective\_lookup()

Tests if an objective lookup service is supported.

An objective lookup service defines methods to access objectives.

**Returns** true if objective lookup is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_objective\_query()

Tests if an objective query service is supported.

**Returns** true if objective query is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_objective\_admin()

Tests if an objective administrative service is supported.

**Returns** true if objective admin is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_objective\_hierarchy()

Tests if an objective hierarchy traversal is supported.

**Returns** true if an objective hierarchy traversal is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_objective\_hierarchy\_design()

Tests if an objective hierarchy design is supported.

Returns true if an objective hierarchy design is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_objective\_sequencing()

Tests if an objective sequencing design is supported.

Returns true if objective sequencing is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_objective\_objective\_bank()

Tests if an objective to objective bank lookup session is available.

**Returns** true if objective objective bank lookup session is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_objective\_objective\_bank\_assignment()

Tests if an objective to objective bank assignment session is available.

Returns true if objective objective bank assignment is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_objective\_requisite()

Tests if an objective requisite service is supported.

Returns true if objective requisite service is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_objective\_requisite\_assignment()

Tests if an objective requisite assignment service is supported.

Returns true if objective requisite assignment service is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

supports\_activity\_lookup()

Tests if an activity lookup service is supported.

Returns true if activity lookup is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_activity\_admin()

Tests if an activity administrative service is supported.

**Returns** true if activity admin is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_activity\_objective\_bank()

Tests if an activity to objective bank lookup session is available.

**Returns** true if activity objective bank lookup session is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_activity\_objective\_bank\_assignment()

Tests if an activity to objective bank assignment session is available.

Returns true if activity objective bank assignment is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_proficiency\_lookup()

Tests if looking up proficiencies is supported.

**Returns** true if proficiency lookup is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_proficiency\_query()

Tests if querying proficiencies is supported.

Returns true if proficiency query is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_proficiency\_admin()

Tests if proficiencyadministrative service is supported.

**Returns** true if proficiency administration is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_objective\_bank\_lookup()

Tests if an objective bank lookup service is supported.

Returns true if objective bank lookup is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_objective\_bank\_admin()

Tests if an objective bank administrative service is supported.

Returns true if objective bank admin is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_objective\_bank\_hierarchy()

Tests if an objective bank hierarchy traversal is supported.

**Returns** true if an objective bank hierarchy traversal is supported, false otherwise

**Return type** boolean

compliance: mandatory – This method must be implemented.

### supports\_objective\_bank\_hierarchy\_design()

Tests if objective bank hierarchy design is supported.

Returns true if an objective bank hierarchy design is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### objective\_record\_types

Gets the supported Objective record types.

Returns a list containing the supported Objective record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### objective\_search\_record\_types

Gets the supported Objective search record types.

**Returns** a list containing the supported Objective search record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### activity\_record\_types

Gets the supported Activity record types.

**Returns** a list containing the supported Activity record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### activity\_search\_record\_types

Gets the supported Activity search record types.

**Returns** a list containing the supported Activity search record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### proficiency\_record\_types

Gets the supported Proficiency record types.

**Returns** a list containing the supported Proficiency record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### proficiency\_search\_record\_types

Gets the supported Proficiency search types.

**Returns** a list containing the supported Proficiency search types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

### objective\_bank\_record\_types

Gets the supported ObjectiveBank record types.

**Returns** a list containing the supported ObjectiveBank record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

### objective\_bank\_search\_record\_types

Gets the supported objective bank search record types.

Returns a list containing the supported ObjectiveBank search record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

### **Learning Manager**

```
class dlkit.services.learning.LearningManager(proxy=None)
```

```
Bases: dlkit.osid.managers.OsidManager, dlkit.osid.sessions.OsidSession, dlkit.services.learning.LearningProfile
```

The learning manager provides access to learning sessions and provides interoperability tests for various aspects of this service.

The sessions included in this manager are:

•ObjectiveLookupSession: a session to look up objectives

•ObjectiveLookupSession: a session to query objectives None

- •ObjectiveSearchSession: a session to search objectives
- •ObjectiveAdminSession: a session to create, modify and delete objectives None
- •ObjectiveNotificationSession: a session to receive messages pertaining to objective "" changes
- •ObjectiveHierarchySession: a session to traverse objective hierarchies
- •ObjectiveHierarchyDesignSession: a session to design objective hierarchies
- •ObjectiveSequencingSession: a session to sequence objectives
- •ObjectiveObjectiveBankSession: a session for retriieving objective and objective bank mappings

•ObjectiveObjectiveBankAssignmentSession: a session for managing objective and objective bank mappings

•ObjectiveSmartObjectiveBankSession: a session for managing dynamic objective banks

•ObjectiveRequisiteSession: a session to examine objective requisites

•ObjectiveRequisiteAssignmentSession: a session to manage objective requisites

•ActivityLookupSession: a session to look up activities

•ActivityQuerySession: a session to query activities None

•ActivitySearchSession: a session to search activities

•ActivityAdminSession: a session to create, modify and delete activities None

•ActivityNotificationSession: a session to receive messages pertaining to activity "" changes

•ActivityObjectiveBankSession: a session for retriieving activity and objective bank mappings

•ActivityObjectiveBankAssignmentSession: a session for managing activity and objective bank mappings

•ActivitySmartObjectiveBankSession: a session for managing dynamic objective banks of activities

•ProficiencyLookupSession: a session to retrieve proficiencies

•ProficiencyQuerySession: a session to query proficiencies

•ProficiencySearchSession: a session to search for proficiencies

•ProficiencyAdminSession: a session to create, update, and delete proficiencies

•ProficiencyNotificationSession: a session to receive notifications pertaining to proficiency changes

•ProficiencyObjectiveBankSession: a session to look up proficiency to objective bank mappings

•ProficiencyObjectiveBankAssignmentSession: a session to manage proficiency to objective bank mappings

•ProficiencySmartObjectiveBankSession: a session to manage smart objective banks of proficiencies

•MyLearningPathSession: a session to examine learning paths of objectives

•LearningPathSession: a session to examine learning paths of objectives

•ObjectiveBankLookupSession: a session to lookup objective banks

•ObjectiveBankQuerySession: a session to query objective banks

•ObjectiveBankSearchSession: a session to search objective banks

•ObjectiveBankAdminSession : a session to create, modify and delete objective banks

•ObjectiveBankNotificationSession: a session to receive messages pertaining to objective bank changes

•ObjectiveBankHierarchySession: a session to traverse the objective bank hierarchy

•ObjectiveBankHierarchyDesignSession: a session to manage the objective bank hierarchy

#### learning\_batch\_manager

 $Gets \ a \ {\tt LearningBatchManager}.$ 

**Returns** a LearningBatchManager

Return type osid.learning.batch.LearningBatchManager

Raise OperationFailed - unable to complete request

**Raise** Unimplemented - supports\_learning\_batch() is false

compliance: optional – This method must be implemented if ''supports\_learning\_batch()'' is true.

# **Objective Bank Lookup Methods**

```
LearningManager.can_lookup_objective_banks()
```

Tests if this user can perform ObjectiveBank lookups.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

**Returns** false if lookup methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
LearningManager.use_comparative_objective_bank_view()
```

The returns from the objective bank methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

```
LearningManager.use_plenary_objective_bank_view()
```

A complete view of the Hierarchy returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

```
LearningManager.get_objective_bank(objective_bank_id)
```

Gets the ObjectiveBank specified by its Id.

In plenary mode, the exact Id is found or a NotFound results. Otherwise, the returned ObjectiveBank may have a different Id than requested, such as the case where a duplicate Id was assigned to a ObjectiveBank and retained for compatility.

Parameters objective\_bank\_id (osid.id.Id) - Id of the ObjectiveBank

Returns the objective bank

Return type osid.learning.ObjectiveBank

Raise NotFound-objective\_bank\_id not found

Raise NullArgument - objective\_bank\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory - This method is must be implemented.

```
LearningManager.get_objective_banks_by_ids (objective_bank_ids)
Gets a ObjectiveBankList corresponding to the given IdList.
```

In plenary mode, the returned list contains all of the objective banks specified in the Id list, in the order of the list, including duplicates, or an error results if an Id in the supplied list is not found or

inaccessible. Otherwise, inaccessible ObjectiveBank objects may be omitted from the list and may present the elements in any order including returning a unique set.

Parameters objective\_bank\_ids (osid.id.IdList) - the list of Ids to retrieve

Returns the returned ObjectiveBank list

Return type osid.learning.ObjectiveBankList

Raise NotFound - an Id was not found

Raise NullArgument - objective\_bank\_ids is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

LearningManager.get\_objective\_banks\_by\_genus\_type (*objective\_bank\_genus\_type*) Gets a ObjectiveBankList corresponding to the given objective bank genus Type which does not include objective banks of types derived from the specified Type.

In plenary mode, the returned list contains all known objective banks or an error results. Otherwise, the returned list may contain only those objective banks that are accessible through this session.

Parameters objective\_bank\_genus\_type (osid.type.Type) - an objective bank genus type

Returns the returned ObjectiveBank list

Return type osid.learning.ObjectiveBankList

**Raise** NullArgument - objective\_bank\_genus\_type is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

LearningManager.get\_objective\_banks\_by\_parent\_genus\_type (*objective\_bank\_genus\_type*) Gets a ObjectiveBankList corresponding to the given objective bank genus Type and include any additional objective banks with genus types derived from the specified Type.

In plenary mode, the returned list contains all known objective banks or an error results. Otherwise, the returned list may contain only those objective banks that are accessible through this session.

**Parameters objective\_bank\_genus\_type** (osid.type.Type) - an objective bank genus type

**Returns** the returned ObjectiveBank list

Return type osid.learning.ObjectiveBankList

Raise NullArgument - objective\_bank\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

LearningManager.get\_objective\_banks\_by\_record\_type (*objective\_bank\_record\_type*) Gets a ObjectiveBankList containing the given objective bank record Type. In plenary mode, the returned list contains all known objective banks or an error results. Otherwise, the returned list may contain only those objective banks that are accessible through this session.

**Parameters objective\_bank\_record\_type** (osid.type.Type) - an objective bank record type

Returns the returned ObjectiveBank list

Return type osid.learning.ObjectiveBankList

Raise NullArgument - objective\_bank\_record\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

LearningManager.get\_objective\_banks\_by\_provider(*resource\_id*) Gets a ObjectiveBankList for the given provider.

In plenary mode, the returned list contains all known objective banks or an error results. Otherwise, the returned list may contain only those objective banks that are accessible through this session.

**Parameters resource\_id** (osid.id.Id) - a resource Id

Returns the returned ObjectiveBank list

Return type osid.learning.ObjectiveBankList

Raise NullArgument - resource\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

### LearningManager.objective\_banks

Gets all ObjectiveBanks.

In plenary mode, the returned list contains all known objective banks or an error results. Otherwise, the returned list may contain only those objective banks that are accessible through this session.

Returns a ObjectiveBankList

Return type osid.learning.ObjectiveBankList

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

### **Objective Bank Admin Methods**

LearningManager.can\_create\_objective\_banks()

Tests if this user can create ObjectiveBanks.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating an ObjectiveBank will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer create operations to unauthorized users.

Returns false if ObjectiveBank creation is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

LearningManager.can\_create\_objective\_bank\_with\_record\_types (*objective\_bank\_record\_types*) Tests if this user can create a single ObjectiveBank using the desired record types.

While LearningManager.getObjectiveBankRecordTypes() can be used to examine which records are supported, this method tests which record(s) are required for creating a specific ObjectiveBank. Providing an empty array tests if an ObjectiveBank can be created with no records.

**Parameters objective\_bank\_record\_types** (osid.type.Type[]) - array of objective bank record types

**Returns** true if ObjectiveBank creation using the specified Types is supported, false otherwise

Return type boolean

**Raise** NullArgument - objective\_bank\_record\_types is null

compliance: mandatory – This method must be implemented.

LearningManager.get\_objective\_bank\_form\_for\_create(*objective\_bank\_record\_types*) Gets the objective bank form for creating new objective banks.

A new form should be requested for each create transaction.

**Parameters objective\_bank\_record\_types** (osid.type.Type[]) - array of objective bank record types

**Returns** the objective bank form

Return type osid.learning.ObjectiveBankForm

Raise NullArgument - objective\_bank\_record\_types is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported – unable to get form for requested record types.

compliance: mandatory – This method must be implemented.

```
LearningManager.create_objective_bank(objective_bank_form)
```

Creates a new ObjectiveBank.

Parameters objective\_bank\_form

ObjectiveBankForm) - the form for this ObjectiveBank

Returns the new ObjectiveBank

Return type osid.learning.ObjectiveBank

**Raise** IllegalState - objective\_bank\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

**Raise** NullArgument - objective\_bank\_form is null

Raise OperationFailed - unable to complete request

 $Raise \ {\tt PermissionDenied-authorization\ failure}$ 

Raise Unsupported - objective\_bank\_form did not originate from
 get\_objective\_bank\_form\_for\_create()

(osid.learning.

compliance: mandatory – This method must be implemented.

LearningManager.can\_update\_objective\_banks()

Tests if this user can update ObjectiveBanks.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating an ObjectiveBank will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer update operations to unauthorized users.

Returns false if ObjectiveBank modification is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
LearningManager.get_objective_bank_form_for_update (objective_bank_id)
Gets the objective bank form for updating an existing objective bank.
```

A new objective bank form should be requested for each update transaction.

Parameters objective\_bank\_id (osid.id.Id) - the Id of the
 ObjectiveBank

**Returns** the objective bank form

Return type osid.learning.ObjectiveBankForm

**Raise** NotFound - objective\_bank\_id is not found

Raise NullArgument - objective\_bank\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

LearningManager.update\_objective\_bank (*objective\_bank\_form*) Updates an existing objective bank.

Parameters objective\_bank\_form(osid.learning.ObjectiveBankForm) - the form containing the elements to be updated

objecciveBanki ork) ale form containing die clements to be updated

**Raise** IllegalState-objective\_bank\_form already used in an update transaction

**Raise** InvalidArgument – the form contains an invalid value

**Raise** NullArgument - objective\_bank\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported - objective\_bank\_form did not originate from
 get\_objective\_bank\_form\_for\_update()

compliance: mandatory – This method must be implemented.

#### LearningManager.can\_delete\_objective\_banks()

Tests if this user can delete objective banks.

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting an ObjectiveBank will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer delete operations to unauthorized users.

Returns false if ObjectiveBank deletion is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

LearningManager.delete\_objective\_bank(objective\_bank\_id)

Deletes an ObjectiveBank.

**Parameters objective\_bank\_id** (osid.id.Id) - the Id of the ObjectiveBank to remove

**Raise** NotFound - objective\_bank\_id not found

Raise NullArgument - objective\_bank\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

```
LearningManager.can_manage_objective_bank_aliases()
```

Tests if this user can manage Id aliases for ObjectiveBanks.

A return of true does not guarantee successful authorization. A return of false indicates that it is known changing an alias will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer alias operations to an unauthorized user.

Returns false if ObjectiveBank aliasing is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
LearningManager.alias_objective_bank (objective_bank_id, alias_id)
Adds an Id to an ObjectiveBank for the purpose of creating compatibility.
```

The primary Id of the ObjectiveBank is determined by the provider. The new Id performs as an alias to the primary Id. If the alias is a pointer to another objective bank, it is reassigned to the given objective bank Id.

# Parameters

- objective\_bank\_id (osid.id.Id) the Id of an ObjectiveBank
- alias\_id (osid.id.Id) the alias Id

Raise AlreadyExists - alias\_id is already assigned

Raise NotFound - objective\_bank\_id not found

Raise NullArgument - objective\_bank\_id or alias\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### **Objective Bank Hierarchy Methods**

LearningManager.objective\_bank\_hierarchy\_id Gets the hierarchy Id associated with this session.

Returns the hierarchy Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

LearningManager.objective\_bank\_hierarchy Gets the hierarchy associated with this session.

**Returns** the hierarchy associated with this session

**Return type** osid.hierarchy.Hierarchy

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

```
LearningManager.can_access_objective_bank_hierarchy()
```

Tests if this user can perform hierarchy queries.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an an application that may not offer traversal functions to unauthorized users.

Returns false if hierarchy traversal methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### LearningManager.use\_comparative\_objective\_bank\_view()

The returns from the objective bank methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

```
LearningManager.use_plenary_objective_bank_view()
```

A complete view of the Hierarchy returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

# LearningManager.root\_objective\_bank\_ids

Gets the root objective bank Ids in this hierarchy.

Returns the root objective bank  ${\tt Ids}$ 

Return type osid.id.IdList

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### LearningManager.root\_objective\_banks

Gets the root objective banks in this objective bank hierarchy.

Returns the root objective banks

Return type osid.learning.ObjectiveBankList

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method is must be implemented.

LearningManager.has\_parent\_objective\_banks (*objective\_bank\_id*) Tests if the ObjectiveBank has any parents.

Parameters objective\_bank\_id (osid.id.Id) - the Id of an objective bank

**Returns** true if the objective bank has parents, false otherwise

Return type boolean

Raise NotFound - objective\_bank\_id is not found

Raise NullArgument - objective\_bank\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

LearningManager.**is\_parent\_of\_objective\_bank** (*id\_, objective\_bank\_id*) Tests if an Id is a direct parent of an objective bank.

#### **Parameters**

- id (osid.id.Id) an Id
- objective\_bank\_id (osid.id.Id) the Id of an objective bank

Returns true if this id is a parent of objective\_bank\_id, false otherwise

Return type boolean

Raise NotFound - objective\_bank\_id is not found

Raise NullArgument - id or objective\_bank\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented. implementation notes*: If id not found return false.

LearningManager.get\_parent\_objective\_bank\_ids (*objective\_bank\_id*) Gets the parent Ids of the given objective bank.

Parameters objective\_bank\_id (osid.id.Id) - the Id of an objective bank

Returns the parent Ids of the objective bank

Return type osid.id.IdList

**Raise** NotFound - objective\_bank\_id is not found

Raise NullArgument - objective\_bank\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

LearningManager.get\_parent\_objective\_banks(objective\_bank\_id)

Gets the parents of the given objective bank.

Parameters objective\_bank\_id (osid.id.Id) - the Id of an objective bank

**Returns** the parents of the objective bank

Return type osid.learning.ObjectiveBankList

**Raise** NotFound - objective\_bank\_id is not found

Raise NullArgument - objective\_bank\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

LearningManager.**is\_ancestor\_of\_objective\_bank** (*id\_, objective\_bank\_id*) Tests if an Id is an ancestor of an objective bank.

#### **Parameters**

- id (osid.id.Id) an Id
- **objective\_bank\_id** (osid.id.Id) the Id of an objective bank

**Returns** true if this id is an ancestor of objective\_bank\_id, false otherwise

Return type boolean

Raise NotFound - objective\_bank\_id is not found

Raise NullArgument - id or objective\_bank\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented. implementation notes*: If id not found return false.

# LearningManager.has\_child\_objective\_banks(objective\_bank\_id)

Tests if an objective bank has any children.

**Parameters objective\_bank\_id** (osid.id.Id) - the Id of an objective bank

Returns true if the objective\_bank\_id has children, false otherwise

Return type boolean

Raise NotFound - objective\_bank\_id is not found

**Raise** NullArgument - objective\_bank\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

LearningManager.**is\_child\_of\_objective\_bank** (*id\_, objective\_bank\_id*) Tests if an objective bank is a direct child of another.

### **Parameters**

- id (osid.id.Id) an Id
- objective\_bank\_id (osid.id.Id) the Id of an objective bank

Returns true if the id is a child of objective\_bank\_id, false otherwise

Return type boolean

Raise NotFound - objective\_bank\_id is not found

**Raise** NullArgument - id or objective\_bank\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented. implementation notes*: If id not found return false.

LearningManager.get\_child\_objective\_bank\_ids (*objective\_bank\_id*) Gets the child Ids of the given objective bank.

Parameters objective\_bank\_id (osid.id.Id) - the Id to query

**Returns** the children of the objective bank

Return type osid.id.IdList

Raise NotFound - objective\_bank\_id is not found

Raise NullArgument - objective\_bank\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

# LearningManager.get\_child\_objective\_banks(objective\_bank\_id)

Gets the children of the given objective bank.

Parameters objective\_bank\_id (osid.id.Id) - the Id to query

**Returns** the children of the objective bank

Return type osid.learning.ObjectiveBankList

Raise NotFound-objective\_bank\_id is not found

**Raise** NullArgument - objective\_bank\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

LearningManager.**is\_descendant\_of\_objective\_bank** (*id\_, objective\_bank\_id*) Tests if an Id is a descendant of an objective bank.

# **Parameters**

- id (osid.id.Id) an Id
- objective\_bank\_id (osid.id.Id) the Id of an objective bank
- **Returns** true if the id is a descendant of the objective\_bank\_id, false otherwise

Return type boolean

Raise NotFound - objective\_bank\_id is not found

Raise NullArgument - id or objective\_bank\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

*compliance: mandatory – This method must be implemented. implementation notes*: If id is not found return false.

```
LearningManager.get_objective_bank_node_ids (objective_bank_id, ances-
tor_levels, descendant_levels,
include_siblings)
```

Gets a portion of the hierarchy for the given objective bank.

#### **Parameters**

- objective\_bank\_id (osid.id.Id) the Id to query
- **ancestor\_levels** (cardinal) the maximum number of ancestor levels to include. A value of 0 returns no parents in the node.
- **descendant\_levels** (cardinal) the maximum number of descendant levels to include. A value of 0 returns no children in the node.
- include\_siblings (boolean) true to include the siblings of the given node, false to omit the siblings

# Returns a catalog node

Return type osid.hierarchy.Node

**Raise** NotFound - objective\_bank\_id not found

**Raise** NullArgument - objective\_bank\_id is null

 $Raise \ {\tt OperationFailed-unable to \ complete \ request}$ 

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

LearningManager.get\_objective\_bank\_nodes (objective\_bank\_id, ancestor\_levels, descendant\_levels, include\_siblings) Gets a portion of the hierarchy for the given objective bank.

#### **Parameters**

- objective\_bank\_id (osid.id.Id) the Id to query
- **ancestor\_levels** (cardinal) the maximum number of ancestor levels to include. A value of 0 returns no parents in the node.
- **descendant\_levels** (cardinal) the maximum number of descendant levels to include. A value of 0 returns no children in the node.
- **include\_siblings** (boolean) true to include the siblings of the given node, false to omit the siblings

Returns an objective bank node

Return type osid.learning.ObjectiveBankNode

Raise NotFound - objective\_bank\_id not found

**Raise** NullArgument - objective\_bank\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

# **Objective Bank Hierarchy Design Methods**

LearningManager.objective\_bank\_hierarchy\_id Gets the hierarchy Id associated with this session.

Returns the hierarchy Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

LearningManager.objective\_bank\_hierarchy

Gets the hierarchy associated with this session.

Returns the hierarchy associated with this session

Return type osid.hierarchy.Hierarchy

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

LearningManager.can\_modify\_objective\_bank\_hierarchy() Tests if this user can change the hierarchy.

A return of true does not guarantee successful authorization. A return of false indicates that it is known performing any update will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer these operations to an unauthorized user.

**Returns** false if changing this hierarchy is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

LearningManager.add\_root\_objective\_bank (*objective\_bank\_id*) Adds a root objective bank.

Parameters objective\_bank\_id (osid.id.Id) - the Id of an objective bank

Raise AlreadyExists - objective\_bank\_id is already in hierarchy

Raise NotFound-objective\_bank\_id not found

Raise NullArgument - objective\_bank\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

LearningManager.remove\_root\_objective\_bank(objective\_bank\_id)

Removes a root objective bank.

Parameters objective\_bank\_id (osid.id.Id) - the Id of an objective bank

**Raise** NotFound - objective\_bank\_id is not a root

Raise NullArgument - objective\_bank\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

LearningManager.add\_child\_objective\_bank (*objective\_bank\_id*, *child\_id*) Adds a child to an objective bank.

### **Parameters**

- objective\_bank\_id (osid.id.Id) the Id of an objective bank
- child\_id (osid.id.Id) the Id of the new child

**Raise** AlreadyExists - objective\_bank\_id is already a parent of child\_id

**Raise** NotFound - objective\_bank\_id or child\_id not found

**Raise** NullArgument - objective\_bank\_id or child\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

LearningManager.remove\_child\_objective\_bank (*objective\_bank\_id*, *child\_id*) Removes a child from an objective bank.

#### Parameters

• objective\_bank\_id (osid.id.Id) - the Id of an objective bank

• child\_id (osid.id.Id) - the Id of the child

Raise NotFound - objective\_bank\_id not a parent of child\_id

**Raise** NullArgument - objective\_bank\_id or child\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

LearningManager.**remove\_child\_objective\_banks** (*objective\_bank\_id*) Removes all children from an objective bank.

Parameters objective\_bank\_id (osid.id.Id) - the Id of an objective bank

Raise NotFound - objective\_bank\_id not in hierarchy

**Raise** NullArgument - objective\_bank\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

# **Objective Bank**

# **Objective Bank**

an objective bank defines a collection of objectives.

# get\_objective\_bank\_record (objective\_bank\_record\_type)

Gets the objective bank record corresponding to the given ObjectiveBank record Type.

This method is used to retrieve an object implementing the requested record. The objective\_bank\_record\_type may be the Type returned in get\_record\_types() or any of its parents in a Type hierarchy where has\_record\_type(objective\_bank\_record\_type) is true.

**Parameters objective\_bank\_record\_type** (osid.type.Type) - an objective bank record type

**Returns** the objective bank record

Return type osid.learning.records.ObjectiveBankRecord

Raise NullArgument - objective\_bank\_record\_type is null

Raise OperationFailed - unable to complete request

Raise Unsupported - has\_record\_type(objective\_bank\_record\_type) is
false

compliance: mandatory – This method must be implemented.

# **Objective Lookup Methods**

# ObjectiveBank.objective\_bank\_id

Gets the ObjectiveBank Id associated with this session.

Returns the ObjectiveBank Id associated with this session

**Return type** osid.id.Id

compliance: mandatory – This method must be implemented.

### ObjectiveBank.objective\_bank

Gets the ObjectiveBank associated with this session.

**Returns** the objective bank

**Return type** osid.learning.ObjectiveBank

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

## ObjectiveBank.can\_lookup\_objectives()

Tests if this user can perform Objective lookups.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

Returns false if lookup methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### ObjectiveBank.use\_comparative\_objective\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

ObjectiveBank.use\_plenary\_objective\_view()

A complete view of the Objective returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

```
ObjectiveBank.use_federated_objective_bank_view()
Federates the view for methods in this session.
```

A federated view will include proficiencies in objective banks which are children of this objective bank in the objective bank hierarchy.

compliance: mandatory – This method is must be implemented.

```
ObjectiveBank.use_isolated_objective_bank_view()
Isolates the view for methods in this session.
```

An isolated view restricts lookups to this objective bank only.

compliance: mandatory - This method is must be implemented.

```
ObjectiveBank.get_objective(objective_id)
```

Gets the Objective specified by its Id.

In plenary mode, the exact Id is found or a NotFound results. Otherwise, the returned Objective may have a different Id than requested, such as the case where a duplicate Id was assigned to an Objective and retained for compatibility.

Parameters objective\_id (osid.id.Id) - Id of the Objective

**Returns** the objective

Return type osid.learning.Objective

**Raise** NotFound - objective\_id not found

Raise NullArgument - objective\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method is must be implemented.

ObjectiveBank.get\_objectives\_by\_ids(objective\_ids)

Gets an <code>ObjectiveList</code> corresponding to the given <code>IdList</code>.

In plenary mode, the returned list contains all of the objectives specified in the Id list, in the order of the list, including duplicates, or an error results if an Id in the supplied list is not found or inaccessible. Otherwise, inaccessible Objectives may be omitted from the list and may present the elements in any order including returning a unique set.

Parameters objective\_ids (osid.id.IdList) - the list of Ids to retrieve

Returns the returned Objective list

Return type osid.learning.ObjectiveList

Raise NotFound - an Id was not found

**Raise** NullArgument - objective\_ids is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_objectives\_by\_genus\_type(objective\_genus\_type)

Gets an ObjectiveList corresponding to the given objective genus Type which does not include objectives of genus types derived from the specified Type.

In plenary mode, the returned list contains all known objectives or an error results. Otherwise, the returned list may contain only those objectives that are accessible through this session.

Parameters objective\_genus\_type (osid.type.Type) - an objective genus
type

**Returns** the returned Objective list

Return type osid.learning.ObjectiveList

**Raise** NullArgument - objective\_genus\_type is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_objectives\_by\_parent\_genus\_type (objective\_genus\_type)

Gets an ObjectiveList corresponding to the given objective genus Type and include any additional objective with genus types derived from the specified Type.

In plenary mode, the returned list contains all known objectives or an error results. Otherwise, the returned list may contain only those objectives that are accessible through this session

Parameters objective\_genus\_type (osid.type.Type) - an objective genus
type

Returns the returned Objective list

Return type osid.learning.ObjectiveList

Raise NullArgument - objective\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_objectives\_by\_record\_type (*objective\_record\_type*) Gets an ObjectiveList containing the given objective record Type.

In plenary mode, the returned list contains all known objectives or an error results. Otherwise, the returned list may contain only those objectives that are accessible through this session.

**Parameters objective\_record\_type** (osid.type.Type) - an objective record type

Returns the returned Objective list

Return type osid.learning.ObjectiveList

Raise NullArgument - objective\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.objectives Gets all Objectives.

In plenary mode, the returned list contains all known objectives or an error results. Otherwise, the returned list may contain only those objectives that are accessible through this session.

Returns an ObjectiveList

Return type osid.learning.ObjectiveList

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

# **Objective Query Methods**

ObjectiveBank.objective\_bank\_id

Gets the ObjectiveBank Id associated with this session.

Returns the ObjectiveBank Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

## ObjectiveBank.objective\_bank

Gets the ObjectiveBank associated with this session.

**Returns** the objective bank

**Return type** osid.learning.ObjectiveBank

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

### ObjectiveBank.can\_search\_objectives()

Tests if this user can perform Objectives searches.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer search operations to unauthorized users.

Returns false if search methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# ObjectiveBank.use\_federated\_objective\_bank\_view()

Federates the view for methods in this session.

A federated view will include proficiencies in objective banks which are children of this objective bank in the obective bank hierarchy.

compliance: mandatory – This method is must be implemented.

## ObjectiveBank.use\_isolated\_objective\_bank\_view() Isolates the view for methods in this session.

An isolated view restricts lookups to this objective bank only.

compliance: mandatory – This method is must be implemented.

ObjectiveBank.objective\_query Gets an objective query.

**Returns** the objective query

Return type osid.learning.ObjectiveQuery

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_objectives\_by\_query (*objective\_query*) Gets a list of Objectives matching the given objective query.

> Parameters objective\_query (osid.learning.ObjectiveQuery) - the objective query

Returns the returned ObjectiveList

**Return type** osid.learning.ObjectiveList

Raise NullArgument - objective\_query is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported - objective\_query is not of this service

*compliance: mandatory – This method must be implemented.* 

## **Objective Admin Methods**

ObjectiveBank.objective\_bank\_id

Gets the ObjectiveBank Id associated with this session.

Returns the ObjectiveBank Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

ObjectiveBank.objective\_bank

Gets the ObjectiveBank associated with this session.

Returns the obective bank

Return type osid.learning.ObjectiveBank

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

# ObjectiveBank.can\_create\_objectives()

Tests if this user can create Objectives.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating an Objective will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer create operations to an unauthorized user.

Returns false if Objective creation is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

ObjectiveBank.can\_create\_objective\_with\_record\_types (*objective\_record\_types*) Tests if this user can create a single Objective using the desired record types.

While LearningManager.getObjectiveRecordTypes() can be used to examine which records are supported, this method tests which record(s) are required for creating a specific Objective. Providing an empty array tests if an Objective can be created with no records.

**Parameters objective\_record\_types** (osid.type.Type[]) - array of objective record types

**Returns** true if Objective creation using the specified record Types is supported, false otherwise

Return type boolean

**Raise** NullArgument - objective\_record\_types is null

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_objective\_form\_for\_create(*objective\_record\_types*) Gets the objective form for creating new objectives.

A new form should be requested for each create transaction.

Parameters objective\_record\_types (osid.type.Type[]) - array of objective record types

**Returns** the objective form

Return type osid.learning.ObjectiveForm

Raise NullArgument - objective\_record\_types is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

**Raise** Unsupported – unable to get form for requested record types

compliance: mandatory – This method must be implemented.

ObjectiveBank.create\_objective(objective\_form)

Creates a new Objective.

Parameters objective\_form (osid.learning.ObjectiveForm) - the form
for this Objective

**Returns** the new Objective

Return type osid.learning.Objective

Raise IllegalState - objective\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

Raise NullArgument - objective\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

**Raise** Unsupported - objective\_form did not originate from get\_objective\_form\_for\_create()

compliance: mandatory – This method must be implemented.

```
ObjectiveBank.can_update_objectives()
```

Tests if this user can update Objectives.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating an Objective will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer update operations to an unauthorized user.

Returns false if objective modification is not authorized, true otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

ObjectiveBank.get\_objective\_form\_for\_update (*objective\_id*) Gets the objective form for updating an existing objective.

A new objective form should be requested for each update transaction.

Parameters objective\_id (osid.id.Id) - the Id of the Objective

Returns the objective form

Return type osid.learning.ObjectiveForm

Raise NotFound-objective\_id is not found

**Raise** NullArgument - objective\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# ObjectiveBank.update\_objective(objective\_form)

Updates an existing objective.

```
Parameters objective_form (osid.learning.ObjectiveForm) – the form containing the elements to be updated
```

**Raise** IllegalState - objective\_form already used in an update transaction

Raise InvalidArgument - the form contains an invalid value

**Raise** NullArgument - objective\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported - objective\_form did not originate from
 get\_objective\_form\_for\_update()

compliance: mandatory – This method must be implemented.

ObjectiveBank.can\_delete\_objectives()

Tests if this user can delete Objectives.

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting an Objective will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer delete operations to an unauthorized user.

**Returns** false if Objective deletion is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

ObjectiveBank.delete\_objective(*objective\_id*) Deletes the Objective identified by the given Id.

Parameters objective\_id (osid.id.Id) - the Id of the Objective to delete

Raise NotFound - an Objective was not found identified by the given Id

**Raise** NullArgument - objective\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

### ObjectiveBank.can\_manage\_objective\_aliases()

Tests if this user can manage Id aliases for Objectives.

A return of true does not guarantee successful authorization. A return of false indicates that it is known changing an alias will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer alias operations to an unauthorized user.

Returns false if Objective aliasing is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

ObjectiveBank.**alias\_objective** (*objective\_id, alias\_id*) Adds an Id to an Objective for the purpose of creating compatibility.

The primary Id of the Objective is determined by the provider. The new Id performs as an alias to the primary Id. If the alias is a pointer to another objective, it is reassigned to the given objective Id.

# Parameters

- objective\_id (osid.id.Id) the Id of an Objective
- alias\_id (osid.id.Id) the alias Id

Raise AlreadyExists - alias\_id is already assigned

**Raise** NotFound - objective\_id not found

Raise NullArgument - objective\_id or alias\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# **Objective Hierarchy Methods**

ObjectiveBank.objective\_hierarchy\_id

Gets the hierarchy  ${\tt Id}$  associated with this session.

Returns the hierarchy Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

### ObjectiveBank.objective\_hierarchy

Gets the hierarchy associated with this session.

Returns the hierarchy associated with this session

Return type osid.hierarchy.Hierarchy

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# ObjectiveBank.can\_access\_objective\_hierarchy()

Tests if this user can perform hierarchy queries.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an an application that may not offer traversal functions to unauthorized users.

**Returns** false if hierarchy traversal methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# ObjectiveBank.use\_comparative\_objective\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

# ObjectiveBank.use\_plenary\_objective\_view()

A complete view of the Objective returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

## ObjectiveBank.root\_objective\_ids

Gets the root objective Ids in this hierarchy.

**Returns** the root objective Ids

Return type osid.id.IdList

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

### ObjectiveBank.root\_objectives

Gets the root objective in this objective hierarchy.

Returns the root objective

Return type osid.learning.ObjectiveList

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method is must be implemented.

ObjectiveBank.has\_parent\_objectives (*objective\_id*) Tests if the Objective has any parents.

Parameters objective\_id (osid.id.Id) - the Id of an objective

Returns true if the objective has parents, false otherwise

Return type boolean

**Raise** NotFound - objective\_id is not found

Raise NullArgument - objective\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.is\_parent\_of\_objective(id\_, objective\_id)

Tests if an Id is a direct parent of an objective.

#### Parameters

• id (osid.id.Id) - an Id

• objective\_id (osid.id.Id) - the Id of an objective

Returns true if this id is a parent of objective\_id, false otherwise

Return type boolean

**Raise** NotFound - objective\_id is not found

Raise NullArgument - id or objective\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented. implementation notes:* If id not found return false.

#### ObjectiveBank.get\_parent\_objective\_ids (objective\_id)

Gets the parent Ids of the given objective.

Parameters objective\_id (osid.id.Id) - the Id of an objective

Returns the parent Ids of the objective

Return type osid.id.IdList

Raise NotFound - objective\_id is not found

**Raise** NullArgument - objective\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# ObjectiveBank.get\_parent\_objectives(objective\_id)

Gets the parents of the given objective.

Parameters objective\_id (osid.id.Id) - the Id of an objective

Returns the parents of the objective

Return type osid.learning.ObjectiveList

**Raise** NotFound - objective\_id is not found

Raise NullArgument - objective\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.is\_ancestor\_of\_objective(*id\_*, *objective\_id*) Tests if an Id is an ancestor of an objective.

# **Parameters**

- id (osid.id.Id) an Id
- objective\_id (osid.id.Id) the Id of an objective

**Returns** true if this id is an ancestor of objective\_id, false otherwise

Return type boolean

**Raise** NotFound - objective\_id is not found

Raise NullArgument - id or objective\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

*compliance: mandatory – This method must be implemented. implementation notes*: If id not found return false.

#### ObjectiveBank.has\_child\_objectives (objective\_id)

Tests if an objective has any children.

Parameters objective\_id (osid.id.Id) - the Id of an objective

**Returns** true if the objective\_id has children, false otherwise

Return type boolean

**Raise** NotFound-objective\_id is not found

Raise NullArgument - objective\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.**is\_child\_of\_objective** (*id\_, objective\_id*) Tests if an objective is a direct child of another.

# **Parameters**

- id (osid.id.Id) an Id
- objective\_id (osid.id.Id) the Id of an objective

Returns true if the id is a child of objective\_id, false otherwise

Return type boolean

**Raise** NotFound - objective\_id is not found

Raise NullArgument - id or objective\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented. implementation notes*: If id not found return false.

ObjectiveBank.get\_child\_objective\_ids (objective\_id)

Gets the child Ids of the given objective.

Parameters objective\_id (osid.id.Id) - the Id to query

**Returns** the children of the objective

Return type osid.id.IdList

**Raise** NotFound - objective\_id is not found

**Raise** NullArgument - objective\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_child\_objectives(objective\_id)

Gets the children of the given objective.

Parameters objective\_id (osid.id.Id) - the Id to query

**Returns** the children of the objective

Return type osid.learning.ObjectiveList

**Raise** NotFound - objective\_id is not found

**Raise** NullArgument - objective\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.**is\_descendant\_of\_objective** (*id\_*, *objective\_id*) Tests if an Id is a descendant of an objective.

#### **Parameters**

• id (osid.id.Id) - an Id

• objective\_id (osid.id.Id) - the Id of an objective

**Returns** true if the id is a descendant of the objective\_id, false otherwise

Return type boolean

**Raise** NotFound - objective\_id is not found

Raise NullArgument - id or objective\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented. implementation notes*: If id is not found return false.

ObjectiveBank.get\_objective\_node\_ids(objective\_id, ancestor\_levels, descendant\_levels, include\_siblings)

Gets a portion of the hierarchy for the given objective.

# Parameters

- objective\_id (osid.id.Id) the Id to query
- **ancestor\_levels** (cardinal) the maximum number of ancestor levels to include. A value of 0 returns no parents in the node.
- **descendant\_levels** (cardinal) the maximum number of descendant levels to include. A value of 0 returns no children in the node.
- include\_siblings (boolean) true to include the siblings of the given node, false to omit the siblings

Returns a catalog node

Return type osid.hierarchy.Node

**Raise** NotFound-objective\_id not found

**Raise** NullArgument - objective\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_objective\_nodes(objective\_id, ancestor\_levels, descendant\_levels, include\_siblings)

Gets a portion of the hierarchy for the given objective.

# Parameters

- objective\_id (osid.id.Id) the Id to query
- **ancestor\_levels** (cardinal) the maximum number of ancestor levels to include. A value of 0 returns no parents in the node.
- **descendant\_levels** (cardinal) the maximum number of descendant levels to include. A value of 0 returns no children in the node.
- **include\_siblings** (boolean) true to include the siblings of the given node, false to omit the siblings

Returns an objective node

Return type osid.learning.ObjectiveNode

**Raise** NotFound - objective\_id not found

**Raise** NullArgument - objective\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# **Objective Hierarchy Design Methods**

```
ObjectiveBank.objective_hierarchy_id
Gets the hierarchy Id associated with this session.
```

Returns the hierarchy Id associated with this session

**Return type** osid.id.Id

compliance: mandatory – This method must be implemented.

# ObjectiveBank.objective\_hierarchy

Gets the hierarchy associated with this session.

**Returns** the hierarchy associated with this session

Return type osid.hierarchy.Hierarchy

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.can\_modify\_objective\_hierarchy()

Tests if this user can change the hierarchy.

A return of true does not guarantee successful authorization. A return of false indicates that it is known performing any update will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer these operations to an unauthorized user.

**Returns** false if changing this hierarchy is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

ObjectiveBank.add\_root\_objective(objective\_id) Adds a root objective.

Parameters objective\_id (osid.id.Id) - the Id of an objective

**Raise** AlreadyExists - objective\_id is already in hierarchy

Raise NotFound - objective\_id not found

**Raise** NullArgument - objective\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.remove\_root\_objective(objective\_id)

Removes a root objective.

Parameters objective\_id (osid.id.Id) - the Id of an objective

**Raise** NotFound – objective\_id not found

**Raise** NullArgument - objective\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.add\_child\_objective(*objective\_id*, *child\_id*) Adds a child to an objective.

**Parameters** 

• objective\_id (osid.id.Id) - the Id of an objective

• child\_id (osid.id.Id) - the Id of the new child

Raise AlreadyExists - objective\_id is already a parent of child\_id

Raise NotFound - objective\_id or child\_id not found

Raise NullArgument - objective\_id or child\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.remove\_child\_objective(*objective\_id*, *child\_id*) Removes a child from an objective.

### **Parameters**

• **objective\_id** (osid.id.Id) – the Id of an objective

• child\_id (osid.id.Id) - the Id of the new child

**Raise** NotFound – objective\_id not a parent of child\_id

Raise NullArgument - objective\_id or child\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.**remove\_child\_objectives** (*objective\_id*) Removes all children from an objective.

**Parameters objective\_id** (osid.id.Id) - the Id of an objective

Raise NotFound - objective\_id not found

Raise NullArgument - objective\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

### **Objective Sequencing Methods**

# ObjectiveBank.objective\_hierarchy\_id

Gets the hierarchy Id associated with this session.

Returns the hierarchy Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

ObjectiveBank.objective\_hierarchy

Gets the hierarchy associated with this session.

Returns the hierarchy associated with this session

Return type osid.hierarchy.Hierarchy

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

```
ObjectiveBank.can_sequence_objectives()
```

Tests if this user can sequence objectives.

A return of true does not guarantee successful authorization. A return of false indicates that it is known performing any update will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer these operations to an unauthorized user.

**Returns** false if sequencing objectives is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Moves an objective ahead of a refrence objective under the given parent.

#### **Parameters**

- parent\_objective\_id (osid.id.Id) the Id of the parent objective
- reference\_objective\_id (osid.id.Id) the Id of the objective
- **objective\_id** (osid.id.Id) the Id of the objective to move ahead of reference\_objective\_id

**Raise** NotFound-parent\_objective\_id, reference\_objective\_id, or objective\_id not found, or reference\_objective\_id or objective\_id is not a child of parent\_objective\_id

Raise NullArgument - parent\_objective\_id, reference\_objective\_id, or id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.move\_objective\_behind(parent\_objective\_id, reference\_objective\_id,

*objective\_id*)

Moves an objective behind a refrence objective under the given parent.

### **Parameters**

- parent\_objective\_id (osid.id.Id) the Id of the parent objective
- reference\_objective\_id (osid.id.Id) the Id of the objective
- objective\_id (osid.id.Id) the Id of the objective to move behind reference\_objective\_id

Raise NotFound-parent\_objective\_id, reference\_objective\_id, or objective\_id not found, or reference\_objective\_id or objective\_id is not a child of parent\_objective\_id

Raise NullArgument - parent\_objective\_id, reference\_objective\_id, or id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented.* 

ObjectiveBank.sequence\_objectives (parent\_objective\_id, objective\_ids)

Sequences a set of objectives under a parent.

#### **Parameters**

- parent\_objective\_id (osid.id.Id) the Id of the parent objective
- **objective\_ids** (osid.id.Id[]) the Id of the objectives

**Raise** NotFound - parent\_id or an objective\_id not found, or an objective\_id is not a child of parent\_objective\_id

Raise NullArgument - paren\_objectivet\_id or objective\_ids is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# **Objective Objective Bank Methods**

ObjectiveBank.can\_lookup\_objective\_objective\_bank\_mappings()

Tests if this user can perform lookups of objective/objective bank mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known lookup methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

Returns false if looking up mappings is not authorized, true otherwise

Return type boolean

compliance: mandatory - This method must be implemented.

ObjectiveBank.use\_comparative\_objective\_bank\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

ObjectiveBank.use\_plenary\_objective\_bank\_view() A complete view of the Activity and ObjectiveBank returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

ObjectiveBank.get\_objective\_ids\_by\_objective\_bank(objective\_bank\_id) Gets the list of Objective Ids associated with an ObjectiveBank.

Parameters objective\_bank\_id (osid.id.Id) - Id of the ObjectiveBank

**Returns** list of related objectives

Return type osid.id.IdList

Raise NotFound - objective\_bank\_id is not found

**Raise** NullArgument - objective\_bank\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_objectives\_by\_objective\_bank (*objective\_bank\_id*) Gets the list of Objectives associated with an ObjectiveBank.

Parameters objective\_bank\_id (osid.id.Id) - Id of the ObjectiveBank

Returns list of related objective Ids

Return type osid.learning.ObjectiveList

Raise NotFound - objective\_bank\_id is not found

Raise NullArgument - objective\_bank\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_objective\_ids\_by\_objective\_banks (*objective\_bank\_ids*) Gets the list of Objective Ids corresponding to a list of ObjectiveBanks.

**Parameters objective\_bank\_ids** (osid.id.IdList) - list of objective bank Ids

Returns list of objective Ids

Return type osid.id.IdList

Raise NullArgument - objective\_bank\_ids is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_objectives\_by\_objective\_banks (*objective\_bank\_ids*) Gets the list of Objectives corresponding to a list of ObjectiveBanks.

**Parameters objective\_bank\_ids** (osid.id.IdList) - list of objective bank Ids

**Returns** list of objectives

Return type osid.learning.ObjectiveList

**Raise** NullArgument - objective\_bank\_ids is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_objective\_bank\_ids\_by\_objective(*objective\_id*) Gets the list of ObjectiveBank Ids mapped to an Objective.

**Parameters objective\_id** (osid.id.Id) - Id of an Objective

Returns list of objective bank Ids

Return type osid.id.IdList

**Raise** NotFound - objective\_id is not found

**Raise** NullArgument - objective\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_objective\_banks\_by\_objective(*objective\_id*) Gets the list of ObjectiveBanks mapped to an Objective.

Parameters objective\_id (osid.id.Id) - Id of an Objective

Returns list of objective banks

Return type osid.learning.ObjectiveBankList

**Raise** NotFound-objective\_id is not found

Raise NullArgument - objective\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

# **Objective Objective Bank Assignment Methods**

### ObjectiveBank.can\_assign\_objectives()

Tests if this user can alter objective/objective bank mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known mapping methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer assignment operations to unauthorized users.

**Returns** false if mapping is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
ObjectiveBank.can_assign_objectives_to_objective_bank(objective_bank_id)
Tests if this user can alter objective/objective bank mappings.
```

A return of true does not guarantee successful authorization. A return of false indicates that it is known mapping methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer assignment operations to unauthorized users.

**Parameters objective\_bank\_id** (osid.id.Id) - the Id of the ObjectiveBank

**Returns** false if mapping is not authorized, true otherwise

Return type boolean

Raise NullArgument - objective\_bank\_id is null

compliance: mandatory – This method must be implemented.

```
ObjectiveBank.get_assignable_objective_bank_ids (objective_bank_id)
Gets a list of objective banks including and under the given objective bank node in which any activity
can be assigned.
```

**Parameters objective\_bank\_id** (osid.id.Id) - the Id of the ObjectiveBank

Returns list of assignable objective bank Ids

Return type osid.id.IdList

**Raise** NullArgument - objective\_bank\_id is null

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

```
ObjectiveBank.get_assignable_objective_bank_ids_for_objective (objective_bank_id,
```

objective id)

Gets a list of objective banks including and under the given objective bank node in which a specific objective can be assigned.

#### **Parameters**

- objective\_bank\_id (osid.id.Id) the Id of the ObjectiveBank
- objective\_id (osid.id.Id) the Id of the Objective

Returns list of assignable objective bank Ids

Return type osid.id.IdList

Raise NullArgument - objective\_id or objective\_bank\_id is null

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

```
ObjectiveBank.assign_objective_to_objective_bank (objective_id, objec-
```

Adds an existing Objective to an ObjectiveBank.

#### **Parameters**

- objective\_id (osid.id.Id) the Id of the Objective
- objective\_bank\_id (osid.id.Id) the Id of the ObjectiveBank
- Raise AlreadyExists objective\_id already mapped to objective\_bank\_id
- Raise NotFound objective\_id or objective\_bank\_id not found
- Raise NullArgument objective\_id or objective\_bank\_id is null

 $Raise \ {\tt OperationFailed-unable to \ complete \ request}$ 

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

Removes an Objective from an ObjectiveBank.

ObjectiveBank.unassign\_objective\_from\_objective\_bank(objective\_id, objec-

tive\_bank\_id)

tive bank id)

#### **Parameters**

• objective\_id (osid.id.Id) - the Id of the Objective

• objective\_bank\_id (osid.id.Id) - the Id of the ObjectiveBank

**Raise** NotFound - objective\_id or objective\_bank\_id not found or objective\_id not mapped to objective\_bank\_id

Raise NullArgument - objective\_id or objective\_bank\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.reassign\_proficiency\_to\_objective\_bank(objective\_id,

from\_objective\_bank\_id,
to\_objective\_bank\_id)

Moves an Objective from one ObjectiveBank to another.

Mappings to other ObjectiveBanks are unaffected.

#### **Parameters**

- objective\_id (osid.id.Id) the Id of the Objective
- from\_objective\_bank\_id (osid.id.Id) the Id of the current ObjectiveBank
- to\_objective\_bank\_id (osid.id.Id) the Id of the destination ObjectiveBank
- Raise NotFound objective\_id, from\_objective\_bank\_id, or to\_objective\_bank\_id not found or objective\_id not mapped to from\_objective\_bank\_id
- Raise NullArgument objective\_id, from\_objective\_bank\_id, or to\_objective\_bank\_id is null
- **Raise** OperationFailed unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# **Objective Requisite Methods**

```
ObjectiveBank.objective_bank_id
```

Gets the ObjectiveBank Id associated with this session.

Returns the ObjectiveBank Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

### ObjectiveBank.objective\_bank

Gets the ObjectiveBank associated with this session.

**Returns** the objective bank

Return type osid.learning.ObjectiveBank

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# ObjectiveBank.can\_lookup\_objective\_prerequisites()

Tests if this user can perform Objective lookups.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

Returns false if lookup methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## ObjectiveBank.use\_comparative\_objective\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory - This method is must be implemented.

```
ObjectiveBank.use_plenary_objective_view()
```

A complete view of the Objective returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory - This method is must be implemented.

ObjectiveBank.use\_federated\_objective\_bank\_view() Federates the view for methods in this session.

A federated view will include proficiencies in objective banks which are children of this objective bank in the obective bank hierarchy.

compliance: mandatory – This method is must be implemented.

ObjectiveBank.use\_isolated\_objective\_bank\_view() Isolates the view for methods in this session.

An isolated view restricts lookups to this objective bank only.

compliance: mandatory – This method is must be implemented.

```
ObjectiveBank.get_requisite_objectives(objective_id)
```

Gets a list of Objectives that are the immediate requisites for the given Objective.

In plenary mode, the returned list contains all of the immediate requisites, or an error results if an Objective is not found or inaccessible. Otherwise, inaccessible Objectives may be omitted from the list and may present the elements in any order including returning a unique set.

**Parameters objective\_id** (osid.id.Id) - Id of the Objective

Returns the returned requisite Objectives

Return type osid.learning.ObjectiveList

Raise NotFound - objective\_id not found

**Raise** NullArgument - objective\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory - This method is must be implemented.

ObjectiveBank.get\_all\_requisite\_objectives(objective\_id)

Gets a list of Objectives that are the requisites for the given Objective including the requistes of the requisites, and so on.

In plenary mode, the returned list contains all of the immediate requisites, or an error results if an Objective is not found or inaccessible. Otherwise, inaccessible Objectives may be omitted from the list and may present the elements in any order including returning a unique set.

**Parameters objective\_id** (osid.id.Id) - Id of the Objective

Returns the returned Objective list

**Return type** osid.learning.ObjectiveList

Raise NotFound - objective\_id not found

Raise NullArgument - objective\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

```
ObjectiveBank.get_dependent_objectives (objective_id)
Gets a list of Objectives that require the given Objective.
```

In plenary mode, the returned list contains all of the immediate requisites, or an error results if an Objective is not found or inaccessible. Otherwise, inaccessible Objectives may be omitted from the list and may present the elements in any order including returning a unique set.

Parameters objective\_id (osid.id.Id) - Id of the Objective

**Returns** the returned Objective list

Return type osid.learning.ObjectiveList

Raise NotFound - objective\_id not found

Raise NullArgument - objective\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.**is\_objective\_required** (*objective\_id*, *required\_objective\_id*) Tests if an objective is required before proceeding with an objective.

One objective may indirectly depend on another objective by way of one or more other objectives.

### Parameters

- objective\_id (osid.id.Id) Id of the dependent Objective
- required\_objective\_id (osid.id.Id) Id of the required Objective

**Returns** true if objective\_id depends on required\_objective\_id, false otherwise

Return type boolean

**Raise** NotFound-objective\_id not found

Raise NullArgument - objective\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_equivalent\_objectives(objective\_id)

Gets a list of Objectives that are equivalent to the given Objective for the purpose of requisites.

An equivalent objective can satisfy the given objective. In plenary mode, the returned list contains all of the equivalent requisites, or an error results if an Objective is not found or inaccessible. Otherwise, inaccessible Objectives may be omitted from the list and may present the elements in any order including returning a unique set.

Parameters objective\_id (osid.id.Id) - Id of the Objective

**Returns** the returned Objective list

Return type osid.learning.ObjectiveList

**Raise** NotFound - objective\_id not found

**Raise** NullArgument - objective\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## **Objective Requisite Assignment Methods**

ObjectiveBank.objective\_bank\_id

Gets the ObjectiveBank Id associated with this session.

Returns the ObjectiveBank Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

ObjectiveBank.objective\_bank

Gets the ObjectiveBank associated with this session.

**Returns** the objective bank

Return type osid.learning.ObjectiveBank

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.can\_assign\_requisites()

Tests if this user can manage objective requisites.

A return of true does not guarantee successful authorization. A return of false indicates that it is known mapping methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer assignment operations to unauthorized users.

**Returns** false if mapping is not authorized, true otherwise

Return type boolean

ObjectiveBank.assign\_objective\_requisite (objective\_id, requisite\_objective\_id) Creates a requirement dependency between two Objectives.

#### **Parameters**

- objective\_id (osid.id.Id) the Id of the dependent Objective
- requisite objective id (osid.id.Id) the Id of the required Objective
- **Raise** AlreadyExists objective id already mapped to \_ requisite\_objective\_id

**Raise** NotFound - objective\_id or requisite\_objective\_id not found

**Raise** NullArgument-objective\_id or requisite\_objective\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

```
ObjectiveBank.unassign_objective_requisite (objective_id,
```

requi-

site objective id) Removes an Objective requisite from an Objective.

### **Parameters**

- objective\_id (osid.id.Id) the Id of the Objective
- requisite objective id (osid.id.Id) the Id of the required Objective

Raise NotFound - objective\_id or requisite\_objective\_id not found or objective\_id not mapped to requisite\_objective\_id

Raise NullArgument-objective\_idor requisite\_objective\_idis null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

```
ObjectiveBank.assign_equivalent_objective(objective_id,
                                                                          equiva-
                                                  lent objective id)
```

Makes an objective equivalent to another objective for the purposes of satisfying a requisite.

#### **Parameters**

- objective\_id (osid.id.Id) the Id of the principal Objective
- equivalent\_objective\_id (osid.id.Id) the Id of the equivalent Objective
- **Raise** AlreadyExists \_ objective id already mapped to equiavelnt\_objective\_id

**Raise** NotFound - objective\_id or equivalent\_objective\_id not found

Raise NullArgument - objective\_id or equivalent\_objective\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

*lent* objective *id*)

compliance: mandatory – This method must be implemented.

ObjectiveBank.unassign\_equivalent\_objective(objective\_id, equiva-

Removes an Objective requisite from an Objective.

#### **Parameters**

- objective\_id (osid.id.Id) the Id of the principal Objective
- equivalent\_objective\_id (osid.id.Id) the Id of the equivalent Objective
- Raise NotFound-objective\_id or equivalent\_objective\_id not found or objective\_id is already equivalent to equivalent\_objective\_id
- **Raise** NullArgument objective\_id or equivalent\_objective\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# **Activity Lookup Methods**

```
ObjectiveBank.objective_bank_id
```

Gets the ObjectiveBank Id associated with this session.

Returns the ObjectiveBank Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### ObjectiveBank.objective bank

Gets the ObjectiveBank associated with this session.

**Returns** the objective bank

Return type osid.learning.ObjectiveBank

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

## ObjectiveBank.can\_lookup\_activities()

Tests if this user can perform Activity lookups.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

Returns false if lookup methods are not authorized, true otherwise

**Return type** boolean

compliance: mandatory – This method must be implemented.

## ObjectiveBank.use\_comparative\_activity\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

ObjectiveBank.use\_plenary\_activity\_view() A complete view of the Activity returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

```
ObjectiveBank.use_federated_objective_bank_view()
Federates the view for methods in this session.
```

A federated view will include proficiencies in objective banks which are children of this objective bank in the objective bank hierarchy.

compliance: mandatory – This method is must be implemented.

```
ObjectiveBank.use_isolated_objective_bank_view()
Isolates the view for methods in this session.
```

An isolated view restricts lookups to this objective bank only.

compliance: mandatory - This method is must be implemented.

ObjectiveBank.get\_activity (activity\_id)

Gets the Activity specified by its Id.

In plenary mode, the exact Id is found or a NotFound results. Otherwise, the returned Activity may have a different Id than requested, such as the case where a duplicate Id was assigned to a Activity and retained for compatibility.

Parameters activity\_id (osid.id.Id) - Id of the Activity

**Returns** the activity

Return type osid.learning.Activity

Raise NotFound - activity\_id not found

Raise NullArgument - activity\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method is must be implemented.

ObjectiveBank.get\_activities\_by\_ids (activity\_ids) Gets an ActivityList corresponding to the given IdList.

In plenary mode, the returned list contains all of the activities specified in the Id list, in the order of the list, including duplicates, or an error results if an Id in the supplied list is not found or inaccessible. Otherwise, inaccessible Activities may be omitted from the list and may present the elements in any order including returning a unique set.

Parameters activity\_ids (osid.id.IdList) - the list of Ids to retrieve

Returns the returned Activity list

Return type osid.learning.ActivityList

Raise NotFound - an Id was not found

Raise NullArgument - activity\_ids is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_activities\_by\_genus\_type (activity\_genus\_type)

Gets an ActivityList corresponding to the given activity genus Type which does not include activities of genus types derived from the specified Type.

In plenary mode, the returned list contains all known activities or an error results. Otherwise, the returned list may contain only those activities that are accessible through this session.

**Parameters activity\_genus\_type** (osid.type.Type) – an activity genus type

Returns the returned Activity list

Return type osid.learning.ActivityList

**Raise** NullArgument - activity\_genus\_type is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_activities\_by\_parent\_genus\_type (activity\_genus\_type)

Gets an ActivityList corresponding to the given activity genus Type and include any additional activity with genus types derived from the specified Type.

In plenary mode, the returned list contains all known activities or an error results. Otherwise, the returned list may contain only those activities that are accessible through this session.

**Parameters activity\_genus\_type** (osid.type.Type) – an activity genus type

Returns the returned Activity list

**Return type** osid.learning.ActivityList

**Raise** NullArgument - activity\_genus\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented.* 

ObjectiveBank.get\_activities\_by\_record\_type (activity\_record\_type) Gets a ActivityList containing the given activity record Type.

In plenary mode, the returned list contains all known activities or an error results. Otherwise, the returned list may contain only those activities that are accessible through this session.

Parameters activity\_record\_type (osid.type.Type) - an activity record
type

Returns the returned Activity list

Return type osid.learning.ActivityList

Raise NullArgument - activity\_record\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

```
ObjectiveBank.get_activities_for_objective(objective_id)
Gets the activities for the given objective.
```

In plenary mode, the returned list contains all of the activities mapped to the objective Id or an error results if an Id in the supplied list is not found or inaccessible. Otherwise, inaccessible Activities may be omitted from the list and may present the elements in any order including returning a unique set.

Parameters objective\_id (osid.id.Id) - Id of the Objective

Returns list of enrollments

Return type osid.learning.ActivityList

Raise NotFound-objective\_id not found

**Raise** NullArgument - objective\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method is must be implemented.

```
ObjectiveBank.get_activities_for_objectives(objective_ids)
```

Gets the activities for the given objectives.

In plenary mode, the returned list contains all of the activities specified in the objective Id list, in the order of the list, including duplicates, or an error results if a course offering Id in the supplied list is not found or inaccessible. Otherwise, inaccessible Activities may be omitted from the list and may present the elements in any order including returning a unique set.

```
Parameters objective_ids (osid.id.IdList) - list of objective Ids
```

Returns list of activities

Return type osid.learning.ActivityList

**Raise** NotFound - an objective\_id not found

**Raise** NullArgument - objective\_id\_list is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method is must be implemented.

```
ObjectiveBank.get_activities_by_asset(asset_id)
```

Gets the activities for the given asset.

In plenary mode, the returned list contains all of the activities mapped to the asset Id or an error results if an Id in the supplied list is not found or inaccessible. Otherwise, inaccessible Activities may be omitted from the list and may present the elements in any order including returning a unique set.

Parameters asset\_id (osid.id.Id) - Id of an Asset

Returns list of activities

Return type osid.learning.ActivityList

**Raise** NotFound-asset\_id not found

**Raise** NullArgument - asset\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method is must be implemented.

ObjectiveBank.get\_activities\_by\_assets (*asset\_ids*) Gets the activities for the given asset.

In plenary mode, the returned list contains all of the activities mapped to the asset Id or an error results if an Id in the supplied list is not found or inaccessible. Otherwise, inaccessible Activities may be omitted from the list and may present the elements in any order including returning a unique set.

Parameters asset\_ids (osid.id.IdList) - Ids of Assets

**Returns** list of activities

**Return type** osid.learning.ActivityList

**Raise** NotFound – an asset\_id not found

**Raise** NullArgument - asset\_id\_list is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method is must be implemented.

# ObjectiveBank.activities

Gets all Activities.

In plenary mode, the returned list contains all known activities or an error results. Otherwise, the returned list may contain only those activities that are accessible through this session.

Returns a ActivityList

Return type osid.learning.ActivityList

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# **Activity Admin Methods**

```
ObjectiveBank.objective_bank_id
```

Gets the ObjectiveBank Id associated with this session.

Returns the ObjectiveBank Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### ObjectiveBank.objective\_bank

Gets the ObjectiveBank associated with this session.

**Returns** the obective bank

Return type osid.learning.ObjectiveBank

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

#### ObjectiveBank.can\_create\_activities()

Tests if this user can create Activities.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating an Activity will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer create operations to an unauthorized user.

**Returns** false if Activity creation is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

ObjectiveBank.can\_create\_activity\_with\_record\_types (activity\_record\_types) Tests if this user can create a single Activity using the desired record types.

While LearningManager.getActivityRecordTypes() can be used to examine which records are supported, this method tests which record(s) are required for creating a specific Activity. Providing an empty array tests if an Activity can be created with no records.

**Parameters activity\_record\_types** (osid.type.Type[]) - array of activity record types

**Returns** true if Activity creation using the specified record Types is supported, false otherwise

Return type boolean

**Raise** NullArgument - activity\_record\_types is null

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_activity\_form\_for\_create(objective\_id,

*ity\_record\_types*)

activ-

Gets the activity form for creating new activities.

A new form should be requested for each create transaction.

# Parameters

- objective\_id (osid.id.Id) the Id of the Objective
- activity\_record\_types (osid.type.Type[]) array of activity record types

Returns the activity form

Return type osid.learning.ActivityForm

Raise NotFound-objective\_id is not found

Raise NullArgument - objective\_id or activity\_record\_types is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported – unable to get form for requested record types

compliance: mandatory – This method must be implemented.

# ObjectiveBank.create\_activity(activity\_form)

Creates a new Activity.

Parameters activity\_form (osid.learning.ActivityForm) - the form for
 this Activity

**Returns** the new Activity

Return type osid.learning.Activity

**Raise** IllegalState – activity\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

Raise NullArgument - activity\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported - activity\_form did not originate from
 get\_activity\_form\_for\_create()

compliance: mandatory – This method must be implemented.

#### ObjectiveBank.can\_update\_activities()

Tests if this user can update Activities.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating an Activity will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer update operations to an unauthorized user.

**Returns** false if activity modification is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
ObjectiveBank.get_activity_form_for_update (activity_id)
Gets the activity form for updating an existing activity.
```

A new activity form should be requested for each update transaction.

Parameters activity\_id (osid.id.Id) - the Id of the Activity

**Returns** the activity form

Return type osid.learning.ActivityForm

Raise NotFound - activity\_id is not found

Raise NullArgument - activity\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.update\_activity (activity\_form)

Updates an existing activity,.

Parameters activity\_form(osid.learning.ActivityForm) - the form containing the elements to be updated

Raise IllegalState - activity\_form already used in an update transaction

Raise InvalidArgument - the form contains an invalid value

Raise NullArgument - activity\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported - activity\_form did not originate from
get\_activity\_form\_for\_update()

```
ObjectiveBank.can_delete_activities()
```

Tests if this user can delete Activities.

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting an Activity will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer delete operations to an unauthorized user.

**Returns** false if Activity deletion is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
ObjectiveBank.delete_activity (activity_id)
```

Deletes the Activity identified by the given Id.

Parameters activity\_id (osid.id.Id) - the Id of the Activity to delete

Raise NotFound - an Activity was not found identified by the given Id

Raise NullArgument - activity\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

# ObjectiveBank.can\_manage\_activity\_aliases()

Tests if this user can manage Id aliases for activities.

A return of true does not guarantee successful authorization. A return of false indicates that it is known changing an alias will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer alias operations to an unauthorized user.

**Returns** false if Activity aliasing is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

ObjectiveBank.alias\_activity (*activity\_id*, *alias\_id*) Adds an Id to an Activity for the purpose of creating compatibility.

The primary Id of the Activity is determined by the provider. The new Id performs as an alias to the primary Id. If the alias is a pointer to another activity, it is reassigned to the given activity Id.

#### **Parameters**

- activity\_id (osid.id.Id) the Id of an Activity
- alias\_id (osid.id.Id) the alias Id

Raise AlreadyExists - alias\_id is already assigned

Raise NotFound - activity\_id not found

Raise NullArgument - activity\_id or alias\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

# **Activity Objective Bank Methods**

## ObjectiveBank.can\_lookup\_activity\_objective\_bank\_mappings()

Tests if this user can perform lookups of activity/objective bank mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known lookup methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

Returns false if looking up mappings is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
ObjectiveBank.use_comparative_objective_bank_view()
```

The returns from the lookup methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

```
ObjectiveBank.use_plenary_objective_bank_view()
```

A complete view of the Activity and ObjectiveBank returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

ObjectiveBank.get\_activity\_ids\_by\_objective\_bank(objective\_bank\_id) Gets the list of Activity Ids associated with an ObjectiveBank.

Parameters objective\_bank\_id (osid.id.Id) - Id of the ObjectiveBank

Returns list of related activity Ids

Return type osid.id.IdList

**Raise** NotFound - objective\_bank\_id is not found

**Raise** NullArgument - objective\_bank\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_activities\_by\_objective\_bank(objective\_bank\_id) Gets the list of Activities associated with an ObjectiveBank.

Parameters objective\_bank\_id (osid.id.Id) - Id of the ObjectiveBank

**Returns** list of related activities

Return type osid.learning.ActivityList

**Raise** NotFound - objective\_bank\_id is not found

Raise NullArgument - objective\_bank\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

ObjectiveBank.get\_activity\_ids\_by\_objective\_banks (*objective\_bank\_ids*) Gets the list of Activity Ids corresponding to a list of ObjectiveBanks.

**Parameters objective\_bank\_ids** (osid.id.IdList) - list of objective bank Ids

Returns list of activity Ids

Return type osid.id.IdList

Raise NullArgument - objective\_bank\_ids is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_activities\_by\_objective\_banks (*objective\_bank\_ids*) Gets the list of Activities corresponding to a list of ObjectiveBanks.

Parameters objective\_bank\_ids (osid.id.IdList) - list of objective bank Ids

Returns list of activities

Return type osid.learning.ActivityList

Raise NullArgument - objective\_bank\_ids is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_objective\_bank\_ids\_by\_activity (activity\_id) Gets the list of ObjectiveBank Ids mapped to a Activity.

Parameters activity\_id (osid.id.Id) - Id of a Activity

Returns list of objective bank Ids

Return type osid.id.IdList

**Raise** NotFound – activity\_id is not found

**Raise** NullArgument - activity\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_objective\_banks\_by\_activity (activity\_id) Gets the list of ObjectiveBanks mapped to a Activity.

Parameters activity\_id(osid.id.Id) - Id of a Activity

Returns list of objective bank Ids

Return type osid.learning.ObjectiveBankList

**Raise** NotFound - activity\_id is not found

Raise NullArgument - activity\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## Activity Objective Bank Assignment Methods

```
ObjectiveBank.can_assign_activities()
```

Tests if this user can alter activity/objective bank mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known mapping methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer assignment operations to unauthorized users.

**Returns** false if mapping is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

ObjectiveBank.can\_assign\_activities\_to\_objective\_bank(*objective\_bank\_id*) Tests if this user can alter activity/objective bank mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known mapping methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer assignment operations to unauthorized users.

**Parameters objective\_bank\_id** (osid.id.Id) - the Id of the ObjectiveBank

**Returns** false if mapping is not authorized, true otherwise

Return type boolean

Raise NullArgument - objective\_bank\_id is null

compliance: mandatory - This method must be implemented.

# ObjectiveBank.get\_assignable\_objective\_bank\_ids(objective\_bank\_id)

Gets a list of objective banks including and under the given objective bank node in which any activity can be assigned.

**Parameters objective\_bank\_id** (osid.id.Id) - the Id of the ObjectiveBank

**Returns** list of assignable objective bank Ids

Return type osid.id.IdList

**Raise** NullArgument - objective\_bank\_id is null

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_assignable\_objective\_bank\_ids\_for\_activity (objective\_bank\_id,

activity\_id)

Gets a list of objective banks including and under the given objective bank node in which a specific activity can be assigned.

# Parameters

- objective\_bank\_id (osid.id.Id) the Id of the ObjectiveBank
- **activity\_id** (osid.id.Id) the Id of the Activity

**Returns** list of assignable objective bank Ids

Return type osid.id.IdList

**Raise** NullArgument - activity\_id or objective\_bank\_id is null

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

```
ObjectiveBank.assign_activity_to_objective_bank(activity_id,
```

objec-

Adds an existing Activity to a ObjectiveBank.

## Parameters

• activity\_id (osid.id.Id) - the Id of the Activity

• **objective\_bank\_id** (osid.id.Id) - the Id of the ObjectiveBank

Raise AlreadyExists - activity\_id already mapped to objective\_bank\_id

Raise NotFound - activity\_id or objective\_bank\_id not found

**Raise** NullArgument - activity\_id or objective\_bank\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.unassign\_activity\_from\_objective\_bank(activity\_id, objec-

tive\_bank\_id)

*tive bank id*)

Removes a Activity from a ObjectiveBank.

# Parameters

• activity\_id (osid.id.Id) - the Id of the Activity

- **objective\_bank\_id** (osid.id.Id) the Id of the ObjectiveBank

**Raise** NullArgument - activity\_id or objective\_bank\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.reassign\_activity\_to\_objective\_bank (activity\_id,

from\_objective\_bank\_id,
to\_objective\_bank\_id)

Moves an Activity from one ObjectiveBank to another.

Mappings to other ObjectiveBanks are unaffected.

## Parameters

- activity\_id (osid.id.Id) the Id of the Activity
- from\_objective\_bank\_id (osid.id.Id) the Id of the current ObjectiveBank
- to\_objective\_bank\_id (osid.id.Id) the Id of the destination ObjectiveBank

Raise NotFound - activity\_id, from\_objective\_bank\_id, or to\_objective\_bank\_id not found or activity\_id not mapped to from\_objective\_bank\_id

Raise NullArgument - activity\_id, from\_objective\_bank\_id, or to\_objective\_bank\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# **Proficiency Lookup Methods**

ObjectiveBank.objective\_bank\_id

Gets the ObjectiveBank Id associated with this session.

Returns the ObjectiveBank Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

ObjectiveBank.objective\_bank

Gets the ObjectiveBank associated with this session.

Returns the obective bank

Return type osid.learning.ObjectiveBank

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.can\_lookup\_proficiencies()

Tests if this user can perform Proficiency lookups.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may not offer lookup operations to unauthorized users.

**Returns** false if lookup methods are not authorized, true otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

ObjectiveBank.use\_comparative\_proficiency\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

ObjectiveBank.use\_plenary\_proficiency\_view()

A complete view of the Proficiency returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

```
ObjectiveBank.use_federated_objective_bank_view()
Federates the view for methods in this session.
```

A federated view will include proficiencies in objective banks which are children of this objective bank in the objective bank hierarchy.

compliance: mandatory – This method is must be implemented.

ObjectiveBank.use\_isolated\_objective\_bank\_view() Isolates the view for methods in this session.

An isolated view restricts lookups to this objective bank only.

compliance: mandatory – This method is must be implemented.

ObjectiveBank.use\_effective\_proficiency\_view() Only proficiencies whose effective dates are current are returned by methods in this session.

compliance: mandatory – This method is must be implemented.

ObjectiveBank.use\_any\_effective\_proficiency\_view() All proficienies of any effective dates are returned by methods in this session.

compliance: mandatory – This method is must be implemented.

ObjectiveBank.get\_proficiency (*proficiency\_id*) Gets the Proficiency specified by its Id.

Parameters proficiency\_id (osid.id.Id) - the Id of the Proficiency to retrieve

Returns the returned Proficiency

Return type osid.learning.Proficiency

Raise NotFound - no Proficiency found with the given Id

**Raise** NullArgument - proficiency\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

```
ObjectiveBank.get_proficiencies_by_ids (proficiency_ids)
```

Gets a ProficiencyList corresponding to the given IdList.

Parameters proficiency\_ids (osid.id.IdList) - the list of Ids to retrieve

**Returns** the returned Proficiency list

Return type osid.learning.ProficiencyList

Raise NotFound - an Id was not found

Raise NullArgument - proficiency\_ids is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_proficiencies\_by\_genus\_type (proficiency\_genus\_type) Gets a ProficiencyList corresponding to the given proficiency genus Type which does not include proficiencies of types derived from the specified Type. Parameters proficiency\_genus\_type (osid.type.Type) - a proficiency
genus type

Returns the returned Proficiency list

Return type osid.learning.ProficiencyList

Raise NullArgument - proficiency\_genus\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_proficiencies\_by\_parent\_genus\_type (*proficiency\_genus\_type*) Gets a ProficiencyList corresponding to the given proficiency genus Type and include any additional proficiencies with genus types derived from the specified Type.

**Parameters proficiency\_genus\_type** (osid.type.Type) - a proficiency genus type

**Returns** the returned Proficiency list

Return type osid.learning.ProficiencyList

Raise NullArgument - proficiency\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_proficiencies\_by\_record\_type (proficiency\_record\_type) Gets a ProficiencyList containing the given proficiency record Type.

Parameters proficiency\_record\_type (osid.type.Type) - a proficiency
record type

Returns the returned Proficiency list

Return type osid.learning.ProficiencyList

**Raise** NullArgument - proficiency\_record\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_proficiencies\_on\_date (from\_, to)

Gets a ProficiencyList effective during the entire given date range inclusive but not confined to the date range.

## **Parameters**

- from (osid.calendaring.DateTime) starting date
- to (osid.calendaring.DateTime) ending date

Returns the returned Proficiency list

Return type osid.learning.ProficiencyList

Raise InvalidArgument - from is greater than to

**Raise** NullArgument – from or to is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_proficiencies\_by\_genus\_type\_on\_date (proficiency\_genus\_type,

Gets a ProficiencyList of the given proficiency genus type effective during the entire given date range inclusive but not confined to the date range.

#### Parameters

- proficiency\_genus\_type (osid.type.Type) a proficiency genus type
- from (osid.calendaring.DateTime) starting date
- to (osid.calendaring.DateTime) ending date

Returns the returned Proficiency list

Return type osid.learning.ProficiencyList

Raise InvalidArgument - from is greater than to

Raise NullArgument - proficiency\_genus\_type, from, or to is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_proficiencies\_for\_objective(objective\_id)

Gets a ProficiencyList relating to the given objective.

Parameters objective\_id (osid.id.Id) - an objective Id

Returns the returned Proficiency list

Return type osid.learning.ProficiencyList

**Raise** NullArgument - objective\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

```
ObjectiveBank.get_proficiencies_for_objective_on_date (objective_id,
```

from\_, to)

from, to)

Gets a ProficiencyList relating to the given objective effective during the entire given date range inclusive but not confined to the date range.

## Parameters

- objective\_id (osid.id.Id) an objective Id
- from (osid.calendaring.DateTime) starting date
- to (osid.calendaring.DateTime) ending date

Returns the returned Proficiency list

Return type osid.learning.ProficiencyList

**Raise** InvalidArgument – from is greater than to

Raise NullArgument - objective\_id, from or to is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_proficiencies\_by\_genus\_type\_for\_objective(objective\_id,

proficiency\_genus\_type)

Gets a ProficiencyList relating to the given objective and proficiency genus Type.

### Parameters

• objective\_id (osid.id.Id) - an objective Id

• proficiency\_genus\_type (osid.type.Type) - a proficiency genus type

Returns the returned Proficiency list

Return type osid.learning.ProficiencyList

Raise NullArgument-objective\_id or proficiency\_genus\_type is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_proficiencies\_by\_genus\_type\_for\_objective\_on\_date (objective\_id,

pro-		
fi-		
ciency_	genus_	_type,
from_,		

to)

Gets a ProficiencyList of the given proficiency genus type relating to the given objective effective during the entire given date range inclusive but not confined to the date range.

# Parameters

- objective\_id (osid.id.Id) an objective Id
- proficiency\_genus\_type (osid.type.Type) a proficiency genus type
- from (osid.calendaring.DateTime) starting date
- to (osid.calendaring.DateTime) ending date

Returns the returned Proficiency list

Return type osid.learning.ProficiencyList

**Raise** InvalidArgument – from is greater than to

Raise NullArgument - objective\_id, proficiency\_genus\_type,
from, or to is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_proficiencies\_for\_objectives(*objective\_ids*) Gets a ProficiencyList relating to the given objectives.

**Parameters objective\_ids** (osid.id.IdList) - the objective Ids

Returns the returned Proficiency list

Return type osid.learning.ProficiencyList

Raise NullArgument - objective\_ids is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_proficiencies\_for\_resource (resource\_id) Gets a ProficiencyList relating to the given resource.

Parameters resource\_id (osid.id.Id) - a resource Id

Returns the returned Proficiency list

Return type osid.learning.ProficiencyList

**Raise** NullArgument - resource\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_proficiencies\_for\_resource\_on\_date (resource\_id, from\_,

Gets a ProficiencyList relating to the given resource effective during the entire given date range inclusive but not confined to the date range.

#### **Parameters**

- resource\_id (osid.id.Id) a resource Id
- from (osid.calendaring.DateTime) starting date
- to (osid.calendaring.DateTime) ending date

**Returns** the returned Proficiency list

Return type osid.learning.ProficiencyList

Raise InvalidArgument - from is greater than to

Raise NullArgument - resource\_id, from or to is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_proficiencies\_by\_genus\_type\_for\_resource (resource\_id,

profi-

ciency\_genus\_type)

Gets a ProficiencyList relating to the given resource and proficiency genus Type.

### Parameters

- resource\_id (osid.id.Id) a resource Id
- proficiency\_genus\_type (osid.type.Type) a proficiency genus type

Returns the returned Proficiency list

Return type osid.learning.ProficiencyList

Raise NullArgument - resource\_id or proficiency\_genus\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_proficiencies\_by\_genus\_type\_for\_resource\_on\_date(resource\_id,

proficiency\_genus\_type, from\_, to)

Gets a ProficiencyList of the given proficiency genus type relating to the given resource effective during the entire given date range inclusive but not confined to the date range.

# Parameters

- resource\_id (osid.id.Id) a resource Id
- proficiency\_genus\_type (osid.type.Type) a proficiency genus type
- from (osid.calendaring.DateTime) starting date
- to (osid.calendaring.DateTime) ending date

**Returns** the returned Proficiency list

Return type osid.learning.ProficiencyList

Raise InvalidArgument - from is greater than to

Raise NullArgument - resource\_id, proficiency\_genus\_type, from
 or to is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_proficiencies\_for\_resources (*resource\_ids*) Gets a ProficiencyList relating to the given resources.

Parameters resource\_ids (osid.id.IdList) - the resource Ids

**Returns** the returned Proficiency list

Return type osid.learning.ProficiencyList

Raise NullArgument - resource\_ids is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_proficiencies\_for\_objective\_and\_resource(objective\_id,

resource\_id)

Gets a ProficiencyList relating to the given objective and resource "....

## **Parameters**

• objective\_id (osid.id.Id) - an objective Id

• resource\_id (osid.id.Id) - a resource Id

Returns the returned Proficiency list

Return type osid.learning.ProficiencyList

Raise NullArgument - objective\_id or resource\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_proficiencies\_for\_objective\_and\_resource\_on\_date (objective\_id,

source\_id,

from\_,

re-

Gets a ProficiencyList relating to the given resource and objective effective during the entire given date range inclusive but not confined to the date range.

# **Parameters**

- objective\_id (osid.id.Id) an objective Id
- resource\_id (osid.id.Id) a resource Id
- from (osid.calendaring.DateTime) starting date
- to (osid.calendaring.DateTime) ending date

Returns the returned Proficiency list

Return type osid.learning.ProficiencyList

**Raise** InvalidArgument – from is greater than to

Raise NullArgument - objective\_id, resource\_id, from or to is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_proficiencies\_by\_genus\_type\_for\_objective\_and\_resource (objective\_id,

re-
source_id,
pro-
fi-
ciency_genus_type

Gets a ProficiencyList of the given genus type relating to the given objective and resource

## **Parameters**

- objective\_id (osid.id.Id) an objective Id
- resource\_id (osid.id.Id) a resource Id
- proficiency\_genus\_type (osid.type.Type) a proficiency genus type

**Returns** the returned Proficiency list

Return type osid.learning.ProficiencyList

Raise NullArgument - objective\_id, resource\_id or
proficiency\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_proficiencies\_by\_genus\_type\_for\_objective\_and\_resource\_on\_date (objectiv

resource\_ proficiency\_ from\_, to)

Gets a ProficiencyList of the given genus type relating to the given resource and objective effective during the entire given date range inclusive but not confined to the date range.

### **Parameters**

- objective\_id (osid.id.Id) an objective Id
- resource\_id (osid.id.Id) a resource Id
- proficiency\_genus\_type (osid.type.Type) a proficiency genus type
- from (osid.calendaring.DateTime) starting date
- to (osid.calendaring.DateTime) ending date

**Returns** the returned Proficiency list

Return type osid.learning.ProficiencyList

Raise InvalidArgument - from is greater than to

Raise NullArgument - objective\_id, resource\_id,
proficiency\_genus\_type, from or to is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## ObjectiveBank.proficiencies

Gets all Proficiencies.

Returns a list of Proficiencies

Return type osid.learning.ProficiencyList

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

# **Proficiency Query Methods**

```
ObjectiveBank.objective_bank_id
```

Gets the ObjectiveBank Id associated with this session.

Returns the ObjectiveBank Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

### ObjectiveBank.objective\_bank

Gets the ObjectiveBank associated with this session.

**Returns** the objective bank

Return type osid.learning.ObjectiveBank

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# ObjectiveBank.can\_search\_proficiencies()

Tests if this user can perform Proficiency lookups.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may not offer lookup operations to unauthorized users.

Returns false if search methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
ObjectiveBank.use_federated_objective_bank_view()
Federates the view for methods in this session.
```

A federated view will include proficiencies in objective banks which are children of this objective bank in the obective bank hierarchy.

compliance: mandatory – This method is must be implemented.

```
ObjectiveBank.use_isolated_objective_bank_view()
Isolates the view for methods in this session.
```

An isolated view restricts lookups to this objective bank only.

compliance: mandatory – This method is must be implemented.

## ObjectiveBank.proficiency\_query

Gets a proficiency query.

**Returns** the proficiency query

Return type osid.learning.ProficiencyQuery

compliance: mandatory – This method must be implemented.

ObjectiveBank.get\_proficiencies\_by\_query (*proficiency\_query*) Gets a list of Proficiencies matching the given proficiency query.

Parameters proficiency\_query (osid.learning.ProficiencyQuery) the proficiency query

Returns the returned ProficiencyList

Return type osid.learning.ProficiencyList

Raise NullArgument - proficiency\_query is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported - proficiency\_query is not of this service

compliance: mandatory – This method must be implemented.

# **Proficiency Admin Methods**

ObjectiveBank.objective\_bank\_id

Gets the ObjectiveBank Id associated with this session.

Returns the ObjectiveBank Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

### ObjectiveBank.objective\_bank

Gets the ObjectiveBank associated with this session.

Returns the obective bank

Return type osid.learning.ObjectiveBank

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

### ObjectiveBank.can\_create\_proficiencies()

Tests if this user can create Proficiencies.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating a Proficiency will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer create operations to an unauthorized user.

Returns false if Proficiency creation is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

ObjectiveBank.can\_create\_proficiency\_with\_record\_types (*proficiency\_record\_types*) Tests if this user can create a single Proficiency using the desired record types.

While LearningManager.getProficiencyRecordTypes() can be used to examine which records are supported, this method tests which record(s) are required for creating a specific Proficiency. Providing an empty array tests if a Proficiency can be created with no records.

Parameters proficiency\_record\_types (osid.type.Type[]) - array of proficiency record types

**Returns** true if Proficiency creation using the specified record Types is supported, false otherwise

Return type boolean

Raise NullArgument - proficiency\_record\_types is null

```
ObjectiveBank.get_proficiency_form_for_create(objective_id, resource_id, pro-
```

ficiency\_record\_types)

Gets the proficiency form for creating new proficiencies.

A new form should be requested for each create transaction.

#### **Parameters**

- objective\_id (osid.id.Id) the Id of the Objective
- resource\_id (osid.id.Id) the Id of the Resource
- proficiency\_record\_types (osid.type.Type[]) array of proficiency record types

# Returns the proficiency form

Return type osid.learning.ProficiencyForm

```
Raise NotFound - objective_id or resource_id is not found
```

Raise NullArgument - objective\_id, resource\_id, or proficieny\_record\_types is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

Raise Unsupported – unable to get form for requested record types

compliance: mandatory – This method must be implemented.

```
ObjectiveBank.create_proficiency(proficiency_form)
```

Creates a new Proficiency.

A new form should be requested for each create transaction.

```
Parameters proficiency_form (osid.learning.ProficiencyForm) - the
    form for this Proficiency
```

Returns the new Proficiency

Return type osid.learning.Proficiency

Raise IllegalState - proficiency\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

**Raise** NullArgument - proficiency\_form is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

**Raise** Unsupported – proficiency\_form did not originate from get\_proficiency\_form\_for\_create()

compliance: mandatory – This method must be implemented.

```
ObjectiveBank.can_update_proficiencies()
```

Tests if this user can update Proficiencies.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating a Proficiency will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer update operations to an unauthorized user.

Returns false if Proficiency modification is not authorized, true otherwise

Return type boolean

ObjectiveBank.get\_proficiency\_form\_for\_update (*proficiency\_id*) Gets the proficiency form for updating an existing proficiency.

Parameters proficiency\_id (osid.id.Id) - the Id of the Proficiency

**Returns** the proficiency form

Return type osid.learning.ProficiencyForm

Raise NotFound - proficiency\_id is not found

Raise NullArgument - proficiency\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.update\_proficiency (proficiency\_form)

Updates an existing proficiency.

**Parameters proficiency\_form** (osid.learning.ProficiencyForm) – the form containing the elements to be updated

Raise IllegalState - proficiency\_form already used in an update transaction

Raise InvalidArgument - the form contains an invalid value

**Raise** NullArgument - proficiency\_form is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

**Raise** Unsupported – proficiency\_form did not originate from get\_proficiency\_form\_for\_update()

compliance: mandatory – This method must be implemented.

# ObjectiveBank.can\_delete\_proficiencies()

Tests if this user can delete Proficiencies.

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting a Proficiency will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer delete operations to an unauthorized user.

**Returns** false if Proficiency deletion is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

ObjectiveBank.delete\_proficiency (proficiency\_id)

Deletes a Proficiency.

Parameters proficiency\_id (osid.id.Id) - the Id of the Proficiency to remove

**Raise** NotFound - proficiency\_id not found

Raise NullArgument - proficiency\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

ObjectiveBank.delete\_proficiencies()

Deletes all proficiencies in this ObjectiveBank.

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ObjectiveBank.can\_manage\_proficiency\_aliases() Tests if this user can manage Id aliases for proficiency entries.

A return of true does not guarantee successful authorization. A return of false indicates that it is known changing an alias will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer alias operations to an unauthorized user.

**Returns** false if Proficiency aliasing is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

ObjectiveBank.alias\_proficiency (*proficiency\_id*, *alias\_id*) Adds an Id to a Proficiency for the purpose of creating compatibility.

The primary Id of the Proficiency is determined by the provider. The new Id performs as an alias to the primary Id. If the alias is a pointer to another proficiency, it is reassigned to the given proficiency Id.

## **Parameters**

• proficiency\_id (osid.id.Id) - the Id of a Proficiency

• alias\_id (osid.id.Id) - the alias Id

Raise AlreadyExists - alias\_id is already assigned

Raise NotFound - proficiency\_id not found

Raise NullArgument - proficiency\_id or alias\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

# Objects

### Objective

```
class dlkit.learning.objects.Objective
Bases: dlkit.osid.objects.OsidObject, dlkit.osid.markers.Federateable
```

An Objective is a statable learning objective.

```
has_assessment()
```

Tests if an assessment is associated with this objective.

**Returns** true if an assessment exists, false otherwise

Return type boolean

#### assessment\_id

Gets the assessment Id associated with this learning objective.

Returns the assessment Id

Return type osid.id.Id

**Raise** IllegalState - has\_assessment() is false

compliance: mandatory – This method must be implemented.

# assessment

Gets the assessment associated with this learning objective.

**Returns** the assessment

Return type osid.assessment.Assessment

**Raise** IllegalState - has\_assessment() is false

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

## has\_knowledge\_category()

Tests if this objective has a knowledge dimension.

Returns true if a knowledge category exists, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# knowledge\_category\_id

Gets the grade Id associated with the knowledge dimension.

Returns the grade Id

Return type osid.id.Id

Raise IllegalState - has\_knowledge\_category() is false

compliance: mandatory – This method must be implemented.

### knowledge\_category

Gets the grade associated with the knowledge dimension.

Returns the grade

Return type osid.grading.Grade

Raise IllegalState - has\_knowledge\_category() is false

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

## has\_cognitive\_process()

Tests if this objective has a cognitive process type.

**Returns** true if a cognitive process exists, false otherwise

Return type boolean

#### cognitive\_process\_id

Gets the grade Id associated with the cognitive process.

Returns the grade Id

Return type osid.id.Id

**Raise** IllegalState - has\_cognitive\_process() is false

compliance: mandatory – This method must be implemented.

# cognitive\_process

Gets the grade associated with the cognitive process.

**Returns** the grade

Return type osid.grading.Grade

Raise IllegalState - has\_cognitive\_process() is false

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

### get\_objective\_record(objective\_record\_type)

Gets the objective bank record corresponding to the given Objective record Type.

This method is used to retrieve an object implementing the requested record. The objective\_record\_type may be the Type returned in get\_record\_types() or any of its parents in a Type hierarchy where has\_record\_type(objective\_record\_type) is true.

#### Parameters objective\_record\_type (osid.type.Type) - an objective record type

**Returns** the objective record

Return type osid.learning.records.ObjectiveRecord

**Raise** NullArgument - objective\_record\_type is null

**Raise** OperationFailed – unable to complete request

**Raise** Unsupported - has\_record\_type (objective\_record\_type) is false

compliance: mandatory – This method must be implemented.

# **Objective Form**

class dlkit.learning.objects.ObjectiveForm

Bases: dlkit.osid.objects.OsidObjectForm, OsidFederateableForm

dlkit.osid.objects.

This is the form for creating and updating Objectives.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the ObjectiveAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

# assessment\_metadata

Gets the metadata for an assessment.

Returns metadata for the assessment

Return type osid.Metadata

assessment

#### knowledge\_category\_metadata

Gets the metadata for a knowledge category.

Returns metadata for the knowledge category

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

knowledge\_category

## cognitive\_process\_metadata

Gets the metadata for a cognitive process.

**Returns** metadata for the cognitive process

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

## cognitive\_process

#### get\_objective\_form\_record (objective\_record\_type)

Gets the ObjectiveFormRecord corresponding to the given objective record Type.

Parameters objective\_record\_type (osid.type.Type) - the objective record type

Returns the objective form record

Return type osid.learning.records.ObjectiveFormRecord

**Raise** NullArgument - objective\_record\_type is null

**Raise** OperationFailed – unable to complete request

**Raise** Unsupported - has\_record\_type (objective\_record\_type) is false

compliance: mandatory – This method must be implemented.

# **Objective List**

class dlkit.learning.objects.ObjectiveList

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, ObjectiveList provides a means for accessing Objective elements sequentially either one at a time or many at a time.

Examples: while (ol.hasNext()) { Objective objective = ol.getNextObjective(); }

or

while (ol.hasNext()) { Objective[] objectives = ol.getNextObjectives(ol.available());

}

## next\_objective

Gets the next Objective in this list.

**Returns** the next Objective in this list. The has\_next() method should be used to test that a next Objective is available before calling this method.

Return type osid.learning.Objective

Raise IllegalState - no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

### get\_next\_objectives(n)

Gets the next set of Objective elements in this list which must be less than or equal to the number returned from available().

- **Parameters n** (cardinal) the number of Objective elements requested which should be less than or equal to available()
- **Returns** an array of Objective elements. The length of the array is less than or equal to the number specified.

Return type osid.learning.Objective

**Raise** IllegalState – no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

# **Objective Node**

class dlkit.learning.objects.ObjectiveNode
 Bases: dlkit.osid.objects.OsidNode

Dases. arkit.0510.00 jects.0510000e

This interface is a container for a partial hierarchy retrieval.

The number of hierarchy levels traversable through this interface depend on the number of levels requested in the ObjectiveHierarchySession.

### objective

Gets the Objective at this node.

**Returns** the objective represented by this node

Return type osid.learning.Objective

compliance: mandatory – This method must be implemented.

## parent\_objective\_nodes

Gets the parents of this objective.

Returns the parents of the id

Return type osid.learning.ObjectiveNodeList

compliance: mandatory – This method must be implemented.

# child\_objective\_nodes

Gets the children of this objective.

Returns the children of this objective

Return type osid.learning.ObjectiveNodeList

compliance: mandatory – This method must be implemented.

## **Objective Node List**

class dlkit.learning.objects.ObjectiveNodeList
 Bases: dlkit.osid.objects.OsidList

Like all OsidLists, ObjectiveNodeList provides a means for accessing ObjectiveNode elements sequentially either one at a time or many at a time.

Examples: while (onl.hasNext()) { ObjectiveNode node = onl.getNextObjectiveNode(); }

or

while (onl.hasNext()) { ObjectiveNode[] nodes = onl.getNextObjectiveNodes(onl.available());

}

next\_objective\_node

Gets the next ObjectiveNode in this list.

**Returns** the next ObjectiveNode in this list. The has\_next() method should be used to test that a next ObjectiveNode is available before calling this method.

Return type osid.learning.ObjectiveNode

Raise IllegalState - no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

# get\_next\_objective\_nodes(n)

Gets the next set of ObjectiveNode elements in this list which must be less than or equal to the number returned from available().

**Parameters n** (cardinal) - the number of ObjectiveNode elements requested which should be less than or equal to available()

**Returns** an array of ObjectiveNode elements. The length of the array is less than or equal to the number specified.

Return type osid.learning.ObjectiveNode

**Raise** IllegalState – no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

# Activity

class dlkit.learning.objects.Activity

Bases: dlkit.osid.objects.OsidObject, dlkit.osid.markers.Subjugateable

An Activity represents learning material or other learning activities to meet an objective.

An Activity has may relate to a set of Asssts for self learning, recommended Courses to take, or a learning Assessment. The learning Assessment differs from the Objective Assessment in that the latter used to test for proficiency in the Objective.

Generally, an Activity should focus on one of assets, courses, assessments, or some other specific activity related to the objective described or related in the ActivityRecord.

#### objective\_id

Gets the Id of the related objective.

**Returns** the objective Id

Return type osid.id.Id

## objective

Gets the related objective.

**Returns** the related objective

Return type osid.learning.Objective

Raise OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

# is\_asset\_based\_activity()

Tests if this is an asset based activity.

**Returns** true if this activity is based on assets, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## asset\_ids

Gets the Ids of any assets associated with this activity.

Returns list of asset Ids

Return type osid.id.IdList

Raise IllegalState - is\_asset\_based\_activity() is false

compliance: mandatory – This method must be implemented.

#### assets

Gets any assets associated with this activity.

Returns list of assets

Return type osid.repository.AssetList

**Raise** IllegalState - is\_asset\_based\_activity() is false

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

### is\_course\_based\_activity()

Tests if this is a course based activity.

Returns true if this activity is based on courses, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### course\_ids

Gets the Ids of any courses associated with this activity.

Returns list of course Ids

Return type osid.id.IdList

**Raise** IllegalState - is\_course\_based\_activity() is false

compliance: mandatory – This method must be implemented.

#### courses

Gets any courses associated with this activity.

Returns list of courses

Return type osid.course.CourseList

**Raise** IllegalState - is\_course\_based\_activity() is false

Raise OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

## is\_assessment\_based\_activity()

Tests if this is an assessment based activity.

These assessments are for learning the objective and not for assessing prodiciency in the objective.

Returns true if this activity is based on assessments, false otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

#### assessment\_ids

Gets the Ids of any assessments associated with this activity.

Returns list of assessment Ids

Return type osid.id.IdList

Raise IllegalState - is\_assessment\_based\_activity() is false

compliance: mandatory – This method must be implemented.

#### assessments

Gets any assessments associated with this activity.

Returns list of assessments

Return type osid.assessment.AssessmentList

Raise IllegalState - is\_assessment\_based\_activity() is false

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

## get\_activity\_record(activity\_record\_type)

Gets the activity record corresponding to the given Activity record Type.

This method is used to retrieve an object implementing the requested record. The activity\_record\_type may be the Type returned in get\_record\_types() or any of its parents in a Type hierarchy where has\_record\_type (activity\_record\_type) is true.

Parameters activity\_record\_type (osid.type.Type) - the type of the record to retrieve

**Returns** the activity record

Return type osid.learning.records.ActivityRecord

**Raise** NullArgument - activity\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type (activity\_record\_type) is false

# **Activity Form**

class dlkit.learning.objects.ActivityForm

Bases: dlkit.osid.objects.OsidObjectForm, OsidSubjugateableForm

dlkit.osid.objects.

This is the form for creating and updating Activities.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the ActivityAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

#### assets\_metadata

Gets the metadata for the assets.

**Returns** metadata for the assets

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

#### assets

## courses\_metadata

Gets the metadata for the courses.

Returns metadata for the courses

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

### courses

## assessments\_metadata

Gets the metadata for the assessments.

**Returns** metadata for the assessments

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

### assessments

get\_activity\_form\_record (activity\_record\_type)

Gets the ActivityFormRecord corresponding to the given activity record Type.

Parameters activity\_record\_type (osid.type.Type) - the activity record type

Returns the activity form record

Return type osid.learning.records.ActivityFormRecord

Raise NullArgument - activity\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type (activity\_record\_type) is false

## **Activity List**

```
class dlkit.learning.objects.ActivityList
```

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, ActivityList provides a means for accessing Activity elements sequentially either one at a time or many at a time.

Examples: while (al.hasNext()) { Activity activity = al.getNextActivity(); }

## or

while (al.hasNext()) { Activity[] activities = al.getNextActivities(al.available());

## }

## next\_activity

Gets the next Activity in this list.

**Returns** the next Activity in this list. The has\_next() method should be used to test that a next Activity is available before calling this method.

Return type osid.learning.Activity

Raise IllegalState - no more elements available in this list

 $Raise \ {\tt OperationFailed-unable to \ complete \ request}$ 

compliance: mandatory – This method must be implemented.

## get\_next\_activities(n)

Gets the next set of Activity elements in this list which must be less than or equal to the number returned from available().

- **Parameters n** (cardinal) the number of Activity elements requested which should be less than or equal to available()
- **Returns** an array of Activity elements. The length of the array is less than or equal to the number specified.

Return type osid.learning.Activity

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

## Proficiency

class dlkit.learning.objects.Proficiency

Bases: dlkit.osid.objects.OsidRelationship

A Proficiency represents a competency of a leraning objective.

## resource\_id

Gets the resource Id to whom this proficiency applies.

Returns the resource Id

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### resource

Gets the resource to whom this proficiency applies.

**Returns** the resource

Return type osid.resource.Resource

**Raise** OperationFailed – unable to complete request

*compliance: mandatory – This method must be implemented.* 

## objective\_id

Gets the objective Id to whom this proficiency applies.

Returns the objective Id

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

## objective

Gets the objective to whom this proficiency applies.

**Returns** the objective

Return type osid.learning.Objective

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

### completion

Gets the completion of this objective as a percentage 0-100.

**Returns** the completion

Return type decimal

compliance: mandatory – This method must be implemented.

### has\_level()

Tests if a proficiency level is available.

Returns true if a level is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## level\_id

Gets the proficiency level expressed as a grade.

Returns the grade Id

Return type osid.id.Id

**Raise** IllegalState - has\_level() is false

compliance: mandatory – This method must be implemented.

### level

Gets the proficiency level expressed as a grade.

Returns the grade

Return type osid.grading.Grade

Raise IllegalState - has\_level() is false

Raise OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

get\_proficiency\_record (proficiency\_record\_type)

Gets the proficiency record corresponding to the given Proficiency record Type.

This method is used to retrieve an object implementing the requested record. The proficiency\_record\_type may be the Type returned in get\_record\_types() or any of its parents in a Type hierarchy where has\_record\_type(proficiency\_record\_type) is true.

**Parameters** proficiency\_record\_type (osid.type.Type) - the type of proficiency record to retrieve

Returns the proficiency record

Return type osid.learning.records.ProficiencyRecord

Raise NullArgument - proficiency\_record\_type is null

Raise OperationFailed - unable to complete request

Raise Unsupported - has\_record\_type (proficiency\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Proficiency Form**

class dlkit.learning.objects.ProficiencyForm

Bases: dlkit.osid.objects.OsidRelationshipForm

This is the form for creating and updating Proficiencies.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the ProficiencyAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

#### completion\_metadata

Gets the metadata for completion percentage.

Returns metadata for the completion percentage

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

#### completion

### level\_metadata

Gets the metadata for a level.

Returns metadata for the grade level

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

### level

## get\_proficiency\_form\_record (proficiency\_record\_type)

Gets the ProficiencyFormRecord corresponding to the given proficiency record Type.

Parameters proficiency\_record\_type (osid.type.Type) - a proficiency record
 type

Returns the proficiency form record

Return type osid.learning.records.ProficiencyFormRecord

**Raise** NullArgument - proficiency\_record\_type is null

Raise OperationFailed - unable to complete request

Raise Unsupported - has\_record\_type (proficiency\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Proficiency List**

class dlkit.learning.objects.ProficiencyList

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, ProficiencyList provides a means for accessing Proficiency elements sequentially either one at a time or many at a time.

Examples: while (pl.hasNext()) { Proficiency proficiency = pl.getNextProficiency(); }

#### or

while (pl.hasNext()) { Proficiency[] proficiencies = pl.getNextProficiencies(pl.available());

### }

### next\_proficiency

Gets the next Proficiency in this list.

**Returns** the next Proficiency in this list. The has\_next() method should be used to test that a next Proficiency is available before calling this method.

Return type osid.learning.Proficiency

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

### get\_next\_proficiencies(n)

Gets the next set of Proficiency elements in this list.

The specified amount must be less than or equal to the return from available().

- Parameters n (cardinal) the number of Proficiency elements requested which must be less than or equal to available()
- **Returns** an array of Proficiency elements. The length of the array is less than or equal to the number specified.

Return type osid.learning.Proficiency

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

#### compliance: mandatory – This method must be implemented.

## **Objective Bank**

```
class dlkit.learning.objects.ObjectiveBank (abc_learning_objects.ObjectiveBank,
```

:noindex:

### get\_objective\_bank\_record (objective\_bank\_record\_type)

Gets the objective bank record corresponding to the given ObjectiveBank record Type.

This method is used to retrieve an object implementing the requested record. The objective\_bank\_record\_type may be the Type returned in get\_record\_types() or any of its parents in a Type hierarchy where has\_record\_type(objective\_bank\_record\_type) is true.

*osid\_objects.OsidCatalog*)

**Parameters objective\_bank\_record\_type** (osid.type.Type) - an objective bank record type

Returns the objective bank record

Return type osid.learning.records.ObjectiveBankRecord

Raise NullArgument - objective\_bank\_record\_type is null

Raise OperationFailed – unable to complete request

**Raise** Unsupported - has\_record\_type(objective\_bank\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Objective Bank Form**

```
class dlkit.learning.objects.ObjectiveBankForm
Bases: dlkit.osid.objects.OsidCatalogForm
```

This is the form for creating and updating objective banks.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the ObjectiveBankAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

## get\_objective\_bank\_form\_record(objective\_bank\_record\_type)

Gets the ObjectiveBankFormRecord corresponding to the given objective bank record Type.

**Parameters objective\_bank\_record\_type** (osid.type.Type) - an objective bank record type

**Returns** the objective bank form record

Return type osid.learning.records.ObjectiveBankFormRecord

**Raise** NullArgument - objective\_bank\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type(objective\_bank\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Objective Bank List**

```
class dlkit.learning.objects.ObjectiveBankList
```

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, ObjectiveBankList provides a means for accessing ObjectiveBank elements sequentially either one at a time or many at a time.

Examples: while (obl.hasNext()) { ObjectiveBank objectiveBanks = obl.getNextObjectiveBank(); }

## or

while (obl.hasNext()) { ObjectiveBank[] objectivBanks = obl.getNextObjectiveBanks(obl.available());

### }

### next\_objective\_bank

Gets the next ObjectiveBank in this list.

**Returns** the next ObjectiveBank in this list. The has\_next() method should be used to test that a next ObjectiveBank is available before calling this method.

Return type osid.learning.ObjectiveBank

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

### get\_next\_objective\_banks(n)

Gets the next set of ObjectiveBank elements in this list which must be less than or equal to the return from available().

Parameters n (cardinal) - the number of ObjectiveBank elements requested which
 must be less than or equal to available()

**Returns** an array of ObjectiveBank elements. The length of the array is less than or equal to the number specified.

Return type osid.learning.ObjectiveBank

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

## **Objective Bank Node**

class dlkit.learning.objects.ObjectiveBankNode

Bases: dlkit.osid.objects.OsidNode

This interface is a container for a partial hierarchy retrieval.

The number of hierarchy levels traversable through this interface depend on the number of levels requested in the ObjectiveBankHierarchySession.

## objective\_bank

Gets the ObjectiveBank at this node.

**Returns** the objective bank represented by this node

Return type osid.learning.ObjectiveBank

compliance: mandatory – This method must be implemented.

## parent\_objective\_bank\_nodes

Gets the parents of this objective bank.

Returns the parents of the id

Return type osid.learning.ObjectiveBankNodeList

compliance: mandatory – This method must be implemented.

child\_objective\_bank\_nodes

Gets the children of this objective bank.

**Returns** the children of this objective bank

Return type osid.learning.ObjectiveBankNodeList

compliance: mandatory – This method must be implemented.

## **Objective Bank Node List**

class dlkit.learning.objects.ObjectiveBankNodeList
 Bases: dlkit.osid.objects.OsidList

Like all OsidLists, ObjectiveBankNodeList provides a means for accessing ObjectiveBankNode elements sequentially either one at a time or many at a time.

Examples: while (obnl.hasNext()) { ObjectiveBankNode node bank = obnl.getNextObjectiveBankNode(); }

or

while (obnl.hasNext()) { ObjectiveBankNode[] nodes = obnl.getNextObjectiveBankNodes(obnl.available());

### next\_objective\_bank\_node

Gets the next ObjectiveBankNode in this list.

**Returns** the next ObjectiveBankNode in this list. The has\_next() method should be used to test that a next ObjectiveBankNode is available before calling this method.

Return type osid.learning.ObjectiveBankNode

**Raise** IllegalState – no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

## get\_next\_objective\_bank\_nodes(n)

Gets the next set of ObjectiveBankNode elements in this list which must be less than or equal to the return from available().

**Parameters n** (cardinal) – the number of ObjectiveBankNode elements requested which must be less than or equal to available ()

**Returns** an array of ObjectiveBankNode elements. The length of the array is less than or equal to the number specified.

Return type osid.learning.ObjectiveBankNode

**Raise** IllegalState – no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

## Queries

## **Objective Query**

class dlkit.learning.queries.ObjectiveQuery

```
Bases:
              dlkit.osid.queries.OsidObjectQuery, dlkit.osid.queries.
OsidFederateableQuery
```

This is the query for searching objectives.

Each method match request produces an AND term while multiple invocations of a method produces a nested OR.

match\_assessment\_id(assessment\_id, match)

Sets the assessment Id for this query.

#### **Parameters**

- assessment id (osid.id.Id) an assessment Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - assessment\_id is null

compliance: mandatory – This method must be implemented.

#### assessment\_id\_terms

### supports\_assessment\_query()

Tests if an AssessmentQuery is available for querying activities.

**Returns** true if an assessment query is available, false otherwise

**Return type** boolean

compliance: mandatory – This method must be implemented.

## assessment\_query

Gets the query for an assessment.

Multiple retrievals produce a nested OR term.

**Returns** the assessment query

Return type osid.assessment.AssessmentQuery

Raise Unimplemented - supports\_assessment\_query() is false

compliance: optional – This method must be implemented if "supports\_assessment\_query()" is "true".

## match\_any\_assessment (match)

Matches an objective that has any assessment assigned.

**Parameters match** (boolean) – true to match objectives with any assessment, false to match objectives with no assessment

compliance: mandatory – This method must be implemented.

### assessment\_terms

```
match_knowledge_category_id(grade_id, match)
    Sets the knowledge category Id for this query.
```

## **Parameters**

- grade\_id (osid.id.Id) a grade Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - grade\_id is null

compliance: mandatory – This method must be implemented.

### knowledge\_category\_id\_terms

## supports\_knowledge\_category\_query()

Tests if a GradeQuery is available for querying knowledge categories.

**Returns** true if a grade query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## knowledge\_category\_query

Gets the query for a knowledge category.

Multiple retrievals produce a nested OR term.

Returns the grade query

Return type osid.grading.GradeQuery

Raise Unimplemented - supports\_knowledge\_category\_query() is false

compliance: optional – This method must be implemented if ''supports\_knowledge\_category\_query()'' is ''true''.

### match\_any\_knowledge\_category (match)

Matches an objective that has any knowledge category.

**Parameters match** (boolean) – true to match objectives with any knowledge category, false to match objectives with no knowledge category

compliance: mandatory – This method must be implemented.

### knowledge\_category\_terms

match\_cognitive\_process\_id (grade\_id, match)

Sets the cognitive process Id for this query.

### Parameters

- grade\_id (osid.id.Id) a grade Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - grade\_id is null

compliance: mandatory – This method must be implemented.

## cognitive\_process\_id\_terms

#### supports\_cognitive\_process\_query()

Tests if a GradeQuery is available for querying cognitive processes.

Returns true if a grade query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### cognitive\_process\_query

Gets the query for a cognitive process.

Multiple retrievals produce a nested OR term.

**Returns** the grade query

Return type osid.grading.GradeQuery

Raise Unimplemented - supports\_cognitive\_process\_query() is false

compliance: optional – This method must be implemented if ''supports\_cognitive\_process\_query()'' is ''true''.

#### match\_any\_cognitive\_process(match)

Matches an objective that has any cognitive process.

**Parameters match** (boolean) – true to match objectives with any cognitive process, false to match objectives with no cognitive process

compliance: mandatory – This method must be implemented.

### cognitive\_process\_terms

match\_activity\_id (activity\_id, match)

Sets the activity  ${\tt Id}$  for this query.

## Parameters

- activity\_id (osid.id.Id) an activity Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - activity\_id is null

compliance: mandatory – This method must be implemented.

### activity\_id\_terms

#### supports\_activity\_query()

Tests if an ActivityQuery is available for querying activities.

**Returns** true if an activity query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## activity\_query

Gets the query for an activity.

Multiple retrievals produce a nested OR term.

**Returns** the activity query

Return type osid.learning.ActivityQuery

Raise Unimplemented - supports\_activity\_query() is false

compliance: optional – This method must be implemented if ''supports\_activity\_query()'' is ''true''.

### match\_any\_activity (match)

Matches an objective that has any related activity.

**Parameters match** (boolean) - true to match objectives with any activity, false to match objectives with no activity

compliance: mandatory – This method must be implemented.

## activity\_terms

match\_requisite\_objective\_id (requisite\_objective\_id, match)

Sets the requisite objective Id for this query.

### **Parameters**

- requisite\_objective\_id (osid.id.Id) a requisite objective Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - requisite\_objective\_id is null

compliance: mandatory – This method must be implemented.

### requisite\_objective\_id\_terms

#### supports\_requisite\_objective\_query()

Tests if an ObjectiveQuery is available for querying requisite objectives.

Returns true if an objective query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## requisite\_objective\_query

Gets the query for a requisite objective.

Multiple retrievals produce a nested OR term.

**Returns** the objective query

Return type osid.learning.ObjectiveQuery

Raise Unimplemented - supports\_requisite\_objective\_query() is false

compliance: optional – This method must be implemented if ''supports\_requisite\_objective\_query()'' is ''true''.

### match\_any\_requisite\_objective (match)

Matches an objective that has any related requisite.

**Parameters match** (boolean) – true to match objectives with any requisite, false to match objectives with no requisite

compliance: mandatory – This method must be implemented.

## requisite\_objective\_terms

match\_dependent\_objective\_id (dependent\_objective\_id, match)

Sets the dependent objective Id to query objectives dependent on the given objective.

### Parameters

- dependent\_objective\_id(osid.id.Id) a dependent objective Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - dependent\_objective\_id is null

compliance: mandatory – This method must be implemented.

## dependent\_objective\_id\_terms

### supports\_depndent\_objective\_query()

Tests if an ObjectiveQuery is available for querying dependent objectives.

**Returns** true if an objective query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### dependent\_objective\_query

Gets the query for a dependent objective.

Multiple retrievals produce a nested OR term.

**Returns** the objective query

Return type osid.learning.ObjectiveQuery

**Raise** Unimplemented - supports\_dependent\_objective\_query() is false

compliance: optional – This method must be implemented if 'supports\_dependent\_query()' is 'true'.

### match\_any\_dependent\_objective (match)

Matches an objective that has any related dependents.

**Parameters match** (boolean) – true to match objectives with any dependent, false to match objectives with no dependents

compliance: mandatory – This method must be implemented.

## dependent\_objective\_terms

match\_equivalent\_objective\_id (equivalent\_objective\_id, match)

Sets the equivalent objective Id to query equivalents.

### Parameters

- equivalent\_objective\_id (osid.id.Id) an equivalent objective Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - equivalent\_objective\_id is null

compliance: mandatory – This method must be implemented.

### equivalent\_objective\_id\_terms

## supports\_equivalent\_objective\_query()

Tests if an ObjectiveQuery is available for querying equivalent objectives.

Returns true if an objective query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### equivalent\_objective\_query

Gets the query for an equivalent objective.

Multiple retrievals produce a nested OR term.

**Returns** the objective query

Return type osid.learning.ObjectiveQuery

Raise Unimplemented - supports\_equivalent\_objective\_query() is false

compliance: optional – This method must be implemented if 'supports\_equivalent\_query()' is 'true'.

### match\_any\_equivalent\_objective(match)

Matches an objective that has any related equivalents.

**Parameters match** (boolean) – true to match objectives with any equivalent, false to match objectives with no equivalents

compliance: mandatory – This method must be implemented.

### equivalent\_objective\_terms

match\_ancestor\_objective\_id(objective\_id, match)

Sets the objective Id for this query to match objectives that have the specified objective as an ancestor.

#### **Parameters**

- objective\_id (osid.id.Id) an objective Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - objective\_id is null

compliance: mandatory – This method must be implemented.

#### ancestor\_objective\_id\_terms

### supports\_ancestor\_objective\_query()

Tests if an ObjectiveQuery is available.

**Returns** true if an objective query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## ancestor\_objective\_query

Gets the query for an objective.

Multiple retrievals produce a nested OR term.

**Returns** the objective query

Return type osid.learning.ObjectiveQuery

Raise Unimplemented - supports\_ancestor\_objective\_query() is false

compliance: optional – This method must be implemented if "supports\_ancestor\_objective\_query()" is "true".

### match\_any\_ancestor\_objective(match)

Matches objectives that have any ancestor.

**Parameters match** (boolean) - true to match objective with any ancestor, false to match root objectives

compliance: mandatory – This method must be implemented.

#### ancestor\_objective\_terms

match\_descendant\_objective\_id(objective\_id, match)

Sets the objective Id for this query to match objectives that have the specified objective as a descendant.

Parameters

- objective\_id (osid.id.Id) an objective Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - objective\_id is null

compliance: mandatory – This method must be implemented.

#### descendant\_objective\_id\_terms

### supports\_descendant\_objective\_query()

Tests if an ObjectiveQuery is available.

**Returns** true if an objective query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## descendant\_objective\_query

Gets the query for an objective.

Multiple retrievals produce a nested OR term.

Returns the objective query

Return type osid.learning.ObjectiveQuery

**Raise** Unimplemented - supports\_descendant\_objective\_query() is false

compliance: optional – This method must be implemented if ''supports\_descendant\_objective\_query()'' is ''true''.

## match\_any\_descendant\_objective(match)

Matches objectives that have any ancestor.

**Parameters match** (boolean) – true to match objectives with any ancestor, false to match leaf objectives

compliance: mandatory – This method must be implemented.

### descendant\_objective\_terms

**match\_objective\_bank\_id** (*objective\_bank\_id*, *match*) Sets the objective bank Id for this query.

#### **Parameters**

- objective\_bank\_id (osid.id.Id) an objective bank Id
- match (boolean) true for a positive match, false for a negative match
- **Raise** NullArgument objective\_bank\_id is null

compliance: mandatory – This method must be implemented.

### objective\_bank\_id\_terms

#### supports\_objective\_bank\_query()

Tests if a ObjectiveBankQuery is available for querying objective banks.

Returns true if an objective bank query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### objective\_bank\_query

Gets the query for an objective bank.

Multiple retrievals produce a nested OR term.

**Returns** the objective bank query

Return type osid.learning.ObjectiveBankQuery

Raise Unimplemented - supports\_objective\_bank\_query() is false

compliance: optional – This method must be implemented if ''supports\_objective\_bank\_query()'' is ''true''.

objective\_bank\_terms

get\_objective\_query\_record(objective\_record\_type)

Gets the objective query record corresponding to the given Objective record Type.

Multiple retrievals produce a nested OR term.

**Parameters objective\_record\_type** (osid.type.Type) - an objective query record type

Returns the objective query record

Return type osid.learning.records.ObjectiveQueryRecord

Raise NullArgument - objective\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type (objective\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Activity Query**

class dlkit.learning.queries.ActivityQuery

Bases: dlkit.osid.queries.OsidObjectQuery, dlkit.osid.queries. OsidSubjugateableQuery

This is the query for searching activities.

Each method match request produces an AND term while multiple invocations of a method produces a nested OR.

match\_objective\_id (objective\_id, match)
Sets the objective Id for this query.

#### **Parameters**

- objective\_id (osid.id.Id) an objective Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - objective\_id is null

compliance: mandatory – This method must be implemented.

## objective\_id\_terms

#### supports\_objective\_query()

Tests if an ObjectiveQuery is available for querying objectives.

Returns true if an objective query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### objective\_query

Gets the query for an objective.

Multiple retrievals produce a nested OR term.

Returns the objective query

Return type osid.learning.ObjectiveQuery

Raise Unimplemented-supports\_objective\_query() is false

compliance: optional – This method must be implemented if "supports\_objective\_query()" is "true".

### objective\_terms

match\_asset\_id (asset\_id, match)

Sets the asset Id for this query.

## Parameters

- asset\_id (osid.id.Id) an asset Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - asset\_id is null

compliance: mandatory – This method must be implemented.

### asset\_id\_terms

#### supports\_asset\_query()

Tests if an AssetQuery is available for querying objectives.

Returns true if an robjective query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### asset\_query

Gets the query for an asset.

Multiple retrievals produce a nested OR term.

**Returns** the asset query

**Return type** osid.repository.AssetQuery

Raise Unimplemented - supports\_asset\_query() is false

compliance: optional – This method must be implemented if "supports\_objective\_query()" is "true".

#### match\_any\_asset (match)

Matches an activity that has any objective assigned.

**Parameters match** (boolean) - true to match activities with any asset, false to match activities with no asset

compliance: mandatory – This method must be implemented.

### asset\_terms

### match\_course\_id(course\_id, match)

Sets the course Id for this query.

## Parameters

- course\_id(osid.id.Id) a course Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - course\_id is null

compliance: mandatory – This method must be implemented.

### course\_id\_terms

### supports\_course\_query()

Tests if a CourseQuery is available for querying courses.

**Returns** true if a course query is available, false otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

### course\_query

Gets the query for a course.

Multiple retrievals produce a nested OR term.

**Returns** the course query

Return type osid.course.CourseQuery

Raise Unimplemented-supports\_course\_query() is false

compliance: optional – This method must be implemented if "supports\_course\_query()" is "true".

#### match\_any\_course(match)

Matches an activity that has any course assigned.

**Parameters match** (boolean) – true to match activities with any courses, false to match activities with no courses

compliance: mandatory – This method must be implemented.

## course\_terms

match\_assessment\_id(assessment\_id, match)

Sets the assessment Id for this query.

### Parameters

- assessment\_id (osid.id.Id) an assessment Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - assessment\_id is null

compliance: mandatory – This method must be implemented.

### assessment\_id\_terms

#### supports\_assessment\_query()

Tests if an AssessmentQuery is available for querying assessments.

Returns true if an assessment query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### assessment\_query

Gets the query for a assessment.

Multiple retrievals produce a nested OR term.

Returns the assessment query

Return type osid.assessment.AssessmentQuery

Raise Unimplemented - supports\_assessment\_query() is false

compliance: optional – This method must be implemented if "supports\_assessment\_query()" is "true".

### match\_any\_assessment (match)

Matches an activity that has any assessment assigned.

**Parameters match** (boolean) – true to match activities with any assessments, false to match activities with no assessments

compliance: mandatory – This method must be implemented.

#### assessment\_terms

match\_objective\_bank\_id (objective\_bank\_id, match)
 Sets the objective bank Id for this query.

### **Parameters**

- objective\_bank\_id (osid.id.Id) an objective bank Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - objective\_bank\_id is null

*compliance: mandatory – This method must be implemented.* 

### objective\_bank\_id\_terms

## supports\_objective\_bank\_query()

Tests if a ObjectiveBankQuery is available for querying resources.

Returns true if an objective bank query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## objective\_bank\_query

Gets the query for an objective bank.

Multiple retrievals produce a nested OR term.

Returns the objective bank query

Return type osid.learning.ObjectiveBankQuery

Raise Unimplemented - supports\_objective\_bank\_query() is false

compliance: optional – This method must be implemented if 'supports\_objective\_bank\_query()'' is ''true''.

## objective\_bank\_terms

### get\_activity\_query\_record (activity\_record\_type)

Gets the activity query record corresponding to the given Activity record Type.

Multiple retrievals produce a nested OR term.

Parameters activity\_record\_type (osid.type.Type) - an activity query record
 type

Returns the activity query record

Return type osid.learning.records.ActivityQueryRecord

Raise NullArgument - activity\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type (activity\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Proficiency Query**

```
class dlkit.learning.queries.ProficiencyQuery
```

Bases: dlkit.osid.queries.OsidRelationshipQuery

This is the query for searching proficiencies.

Each method match specifies an AND term while multiple invocations of the same method produce a nested OR.

match\_resource\_id (resource\_id, match)
Sets the resource Id for this query.

Parameters

- resource\_id (osid.id.Id) a resource Id
- match (boolean) true if a positive match, false for a negative match

**Raise** NullArgument - resource\_id is null

compliance: mandatory – This method must be implemented.

### resource\_id\_terms

### supports\_resource\_query()

Tests if a ResourceQuery is available.

Returns true if a resource query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## resource\_query

Gets the query for a resource.

Multiple retrievals produce a nested OR term.

**Returns** the resource query

Return type osid.resource.ResourceQuery

**Raise** Unimplemented - supports\_resource\_query() is false

compliance: optional – This method must be implemented if "supports\_resource\_query()" is "true".

### resource\_terms

match\_objective\_id (objective\_id, match)

Sets the objective Id for this query.

## Parameters

- objective\_id (osid.id.Id) an objective Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - objective\_id is null

compliance: mandatory – This method must be implemented.

### objective\_id\_terms

## supports\_objective\_query()

Tests if an ObjectiveQuery is available for querying objectives.

**Returns** true if an robjective query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### objective\_query

Gets the query for an objective.

Multiple retrievals produce a nested OR term.

**Returns** the objective query

Return type osid.learning.ObjectiveQuery

Raise Unimplemented - supports\_objective\_query() is false

compliance: optional – This method must be implemented if "supports\_objective\_query()" is "true".

#### match\_any\_objective(match)

Matches an activity that has any objective assigned.

**Parameters match** (boolean) - true to match activities with any objective, false to match activities with no objective

compliance: mandatory – This method must be implemented.

## objective\_terms

match\_completion (start, end, match)

Sets the completion for this query to match completion percentages between the given range inclusive.

#### **Parameters**

- start (decimal) start of range
- end (decimal) end of range
- match (boolean) true for a positive match, false for a negative match

Raise InvalidArgument - end is less than start

compliance: mandatory – This method must be implemented.

## completion\_terms

match\_minimum\_completion(completion, match)

Sets the minimum completion for this query.

## Parameters

- completion (decimal) completion percentage
- match (boolean) true for a positive match, false for a negative match

compliance: mandatory – This method must be implemented.

#### minimum\_completion\_terms

match\_level\_id (grade\_id, match)
 Sets the level grade Id for this query.

#### **Parameters**

- grade\_id (osid.id.Id) a grade Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - grade\_id is null

compliance: mandatory – This method must be implemented.

level\_id\_terms

supports\_level\_query()

Tests if a GradeQuery is available.

**Returns** true if a grade query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## level\_query

Gets the query for a grade.

Multiple retrievals produce a nested OR term.

**Returns** the grade query

Return type osid.grading.GradeQuery

Raise Unimplemented - supports\_level\_query() is false

compliance: optional – This method must be implemented if ''supports\_level\_query()'' is ''true''.

## match\_any\_level (match)

Matches an assessment offered that has any level assigned.

**Parameters match** (boolean) – true to match offerings with any level, false to match offerings with no levsls

compliance: mandatory – This method must be implemented.

### level\_terms

match\_objective\_bank\_id (objective\_bank\_id, match)
 Sets the objective bank Id for this query.

## **Parameters**

- objective\_bank\_id (osid.id.Id) an objective bank Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - objective\_bank\_id is null

compliance: mandatory – This method must be implemented.

### objective\_bank\_id\_terms

### supports\_objective\_bank\_query()

Tests if a ObjectiveBankQuery is available for querying resources.

Returns true if an objective bank query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### objective\_bank\_query

Gets the query for an objective bank.

Multiple retrievals produce a nested OR term.

**Returns** the objective bank query

Return type osid.learning.ObjectiveBankQuery

Raise Unimplemented - supports\_objective\_bank\_query() is false

compliance: optional – This method must be implemented if ''supports\_objective\_bank\_query()'' is ''true''.

### objective\_bank\_terms

#### get\_proficiency\_query\_record (proficiency\_record\_type)

Gets the proficiency query record corresponding to the given Proficiency record Type.

Multiple retrievals produce a nested OR term.

**Parameters proficiency\_record\_type** (osid.type.Type) - a proficiency offered record type

Returns the proficiency offered query record

Return type osid.learning.records.ProficiencyQueryRecord

Raise NullArgument - proficiency\_offered\_record\_type is null

**Raise** OperationFailed – unable to complete request

Raise Unsupported-has\_record\_type(proficiency\_offered\_record\_type)
is false

compliance: mandatory – This method must be implemented.

## **Objective Bank Query**

```
class dlkit.learning.queries.ObjectiveBankQuery
```

Bases: dlkit.osid.queries.OsidCatalogQuery

This is the query for searching objective banks.

Each method specifies an AND term while multiple invocations of the same method produce a nested OR.

**match\_objective\_id** (*objective\_id*, *match*) Sets the objective Id for this query.

Parameters

- objective\_id (osid.id.Id) an objective Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - objective\_id is null

compliance: mandatory – This method must be implemented.

## objective\_id\_terms

#### supports\_objective\_query()

Tests if an ObjectiveQuery is available.

Returns true if an objective query is available, false otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

### objective\_query

Gets the query for an objective.

Multiple retrievals produce a nested OR term.

Returns the objective query

Return type osid.learning.ObjectiveQuery

Raise Unimplemented-supports\_objective\_query() is false

compliance: optional – This method must be implemented if "supports\_objective\_query()" is "true".

#### match\_any\_objective(match)

Matches an objective bank that has any objective assigned.

**Parameters match** (boolean) – true to match objective banks with any objective, false to match objective banks with no objectives

compliance: mandatory – This method must be implemented.

### objective\_terms

match\_activity\_id (activity\_id, match)
Sets the activity Id for this query.

**Parameters** 

• activity\_id (osid.id.Id) - an activity Id

• match (boolean) - true for a positive match, false for a negative match

**Raise** NullArgument - activity\_id is null

compliance: mandatory – This method must be implemented.

## activity\_id\_terms

## supports\_activity\_query()

Tests if a ActivityQuery is available for querying activities.

**Returns** true if an activity query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### activity\_query

Gets the query for an activity.

Multiple retrievals produce a nested OR term.

**Returns** the activity query

**Return type** osid.learning.ActivityQuery

Raise Unimplemented - supports\_activity\_query() is false

compliance: optional – This method must be implemented if "supports\_activity\_query()" is "true".

### match\_any\_activity (match)

Matches an objective bank that has any activity assigned.

**Parameters match** (boolean) – true to match objective banks with any activity, false to match objective banks with no activities

compliance: mandatory – This method must be implemented.

### activity\_terms

#### match\_ancestor\_objective\_bank\_id(objective\_bank\_id, match)

Sets the objective bank Id for this query to match objective banks that have the specified objective bank as an ancestor.

## Parameters

- objective\_bank\_id (osid.id.Id) an objective bank Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - objective\_bank\_id is null

compliance: mandatory – This method must be implemented.

### ancestor\_objective\_bank\_id\_terms

### supports\_ancestor\_objective\_bank\_query()

Tests if a ObjectiveBankQuery is available for querying ancestor objective banks.

**Returns** true if an objective bank query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## ancestor\_objective\_bank\_query

Gets the query for an objective bank.

Multiple retrievals produce a nested OR term.

Returns the objective bank query

Return type osid.learning.ObjectiveBankQuery

Raise Unimplemented - supports\_ancestor\_objective\_bank\_query() is
false

compliance: optional – This method must be implemented if ''supports\_ancestor\_calndar\_query()'' is ''true''.

## match\_any\_ancestor\_objective\_bank (match)

Matches an objective bank that has any ancestor.

**Parameters match** (boolean) - true to match objective banks with any ancestor, false to match root objective banks

compliance: mandatory – This method must be implemented.

#### ancestor\_objective\_bank\_terms

## match\_descendant\_objective\_bank\_id(objective\_bank\_id, match)

Sets the objective bank Id for this query to match objective banks that have the specified objective bank as a descendant.

**Parameters** 

- objective\_bank\_id (osid.id.Id) an objective bank Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - objective\_bank\_id is null

compliance: mandatory – This method must be implemented.

## descendant\_objective\_bank\_id\_terms

### supports\_descendant\_objective\_bank\_query()

Tests if a ObjectiveBankQuery is available for querying descendant objective banks.

Returns true if an objective bank query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### descendant\_objective\_bank\_query

Gets the query for an objective bank.

Multiple retrievals produce a nested OR term.

**Returns** the objective bank query

Return type osid.learning.ObjectiveBankQuery

Raise Unimplemented - supports\_descendant\_objective\_bank\_query() is
false

compliance: optional – This method must be implemented if ''supports\_descendant\_calndar\_query()'' is ''true''.

## match\_any\_descendant\_objective\_bank(match)

Matches an objective bank that has any descendant.

**Parameters match** (boolean) - true to match objective banks with any descendant, false to match leaf objective banks

compliance: mandatory – This method must be implemented.

### descendant\_objective\_bank\_terms

get\_objective\_bank\_query\_record(objective\_bank\_record\_type)

Gets the objective bank query record corresponding to the given ObjectiveBank record Type.

Multiple record retrievals produce a nested OR term.

**Parameters objective\_bank\_record\_type** (osid.type.Type) - an objective bank record type

**Returns** the objective bank query record

Return type osid.learning.records.ObjectiveBankQueryRecord

Raise NullArgument - objective\_bank\_record\_type is null

**Raise** OperationFailed – unable to complete request

**Raise** Unsupported - has\_record\_type(objective\_bank\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Records**

## **Objective Record**

class dlkit.learning.records.ObjectiveRecord Bases: dlkit.osid.records.OsidRecord

A record for an Objective.

The methods specified by the record type are available through the underlying object.

## **Objective Query Record**

class dlkit.learning.records.ObjectiveQueryRecord
 Bases: dlkit.osid.records.OsidRecord

A record for an ObjectiveQuery.

The methods specified by the record type are available through the underlying object.

## **Objective Form Record**

class dlkit.learning.records.ObjectiveFormRecord Bases: dlkit.osid.records.OsidRecord

A record for an ObjectiveForm.

The methods specified by the record type are available through the underlying object.

## **Objective Search Record**

class dlkit.learning.records.ObjectiveSearchRecord Bases: dlkit.osid.records.OsidRecord

A record for an ObjectiveSearch.

The methods specified by the record type are available through the underlying object.

## **Activity Record**

class dlkit.learning.records.ActivityRecord Bases: dlkit.osid.records.OsidRecord

A record for a Activity.

The methods specified by the record type are available through the underlying object.

## **Activity Query Record**

class dlkit.learning.records.ActivityQueryRecord
 Bases: dlkit.osid.records.OsidRecord

A record for an ActivityQuery.

The methods specified by the record type are available through the underlying object.

## **Activity Form Record**

class dlkit.learning.records.ActivityFormRecord Bases: dlkit.osid.records.OsidRecord

A record for a ActivityForm.

The methods specified by the record type are available through the underlying object.

## **Activity Search Record**

class dlkit.learning.records.ActivitySearchRecord Bases: dlkit.osid.records.OsidRecord

A record for an ActivitySearch.

The methods specified by the record type are available through the underlying object.

## **Proficiency Record**

class dlkit.learning.records.ProficiencyRecord Bases: dlkit.osid.records.OsidRecord

A record for a Proficiency.

The methods specified by the record type are available through the underlying object.

## **Proficiency Query Record**

class dlkit.learning.records.ProficiencyQueryRecord Bases: dlkit.osid.records.OsidRecord

A record for a ProficiencyQuery.

The methods specified by the record type are available through the underlying object.

## **Proficiency Form Record**

```
class dlkit.learning.records.ProficiencyFormRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for a ProficiencyForm.

The methods specified by the record type are available through the underlying object.

## **Proficiency Search Record**

class dlkit.learning.records.ProficiencySearchRecord Bases: dlkit.osid.records.OsidRecord

A record for a ProficiencySearch.

The methods specified by the record type are available through the underlying object.

## **Objective Bank Record**

class dlkit.learning.records.ObjectiveBankRecord
Bases: dlkit.osid.records.OsidRecord

A record for a ObjectiveBank.

The methods specified by the record type are available through the underlying object.

## **Objective Bank Query Record**

class dlkit.learning.records.ObjectiveBankQueryRecord Bases: dlkit.osid.records.OsidRecord

A record for an ObjectiveBankQuery.

The methods specified by the record type are available through the underlying object.

## **Objective Bank Form Record**

class dlkit.learning.records.ObjectiveBankFormRecord Bases: dlkit.osid.records.OsidRecord

A record for a ObjectiveBankForm.

The methods specified by the record type are available through the underlying object.

## **Objective Bank Search Record**

class dlkit.learning.records.ObjectiveBankSearchRecord Bases: dlkit.osid.records.OsidRecord

A record for a ObjectiveBankSearch.

The methods specified by the record type are available through the underlying object.

# Osid

## Summary

Core Service Interface Definitions osid version 3.0.0

The Open Service Interface Definitions (OSIDs) is a service-based architecture to promote software interoperability. The OSIDs are a large suite of interface contract specifications that describe the integration points among services and system components for the purpose of creating choice among a variety of different and independently developed applications and systems, allowing independent evolution of software components within a complex system, and federated service providers.

The OSIDs were initially developed in 2001 as part of the MIT Open Knowledge Initiative Project funded by the Andrew W. Mellon Foundation to provide an architecture for higher education learning systems. OSID 3K development began in 2006 to redesign the capabilities of the specifications to apply to a much broader range of service domains and integration challenges among both small and large-scale enterprise systems.

The osid package defines the building blocks for the OSIDs which are defined in packages for their respective services. This package defines the top-level interfaces used by all the OSIDs as well as specification metadata and the OSID Runtime interface.

Meta Interfaces and Enumerations

- OSID: an enumeration listing the OSIDs defined in the specification.
- Syntax: an enumeration listing primitive types
- Metadata: an interface for describing data constraints on a data element

### Interface Behavioral Markers

Interface behavioral markers are used to tag a behavioral pattern of the interface used to construct other object interfaces.

- OsidPrimitive: marks an OSID interface used as a primitive. OSID primitives may take the form interfaces if not bound to a language primitive. Interfaces used as primitives are marked to indicate that the underlying objects may be constructed by an OSID Consumer and an OSID Provider must honor any OSID primitive regardless of its origin.
- Identifiable: Marks an interface identifiable by an OSID Id.

- Extensible: Marks an interface as extensible through OsidRecords.
- Browsable: Marks an interface as providing Property inspection for its OsidRecords.
- Suppliable: Marks an interface as accepting data from an OSID Consumer.
- Temporal: Marks an interface that has a lifetime with begin an end dates.
- Subjugateable: Mars an interface that is dependent on another object.
- Aggregateable: Marks an interface that contains other objects normally related through other services.
- Containable: Marks an interface that contains a recursive reference to itself.
- Sourceable: Marks an interface as having a provider.
- Federateable: Marks an interface that can be federated using the OSID Hierarchy pattern.
- Operable: Marks an interface as responsible for performing operatons or tasks. Operables may be enabled or disabled.

Abstract service Interfaces

- OsidProfile: Defines interoperability methods used by OsidManagers.
- OsidManager: The entry point into an OSID and provides access to OsidSessions.
- OsidProxyManager: Another entry point into an OSID providing a means for proxying data from a middle tier application server to an underlying OSID Provider.
- OsidSession : A service interface accessible from an OsidManager that defines a set of methods for an aspect of a service.

Object-like interfaces are generally defined along lines of interoperability separating issues of data access from data management and searching. These interfaces may also implement any of the abstract behavioral interfaces listed above. The OSIDs do not adhere to a DAO/DTO model in its service definitions in that there are service methods defined on the objects (although they can be implemented using DTOs if desired). For the sake of an outline, we'll pretend they are data objects.

- OsidObject: Defines object data. OsidObjects are accessed from OsidSessions. OsidObjects are part of an interface hierarchy whose interfaces include the behavioral markers and a variety of common OsidObjects. All OsidObjects are Identifiable, Extensible, and have a Type. There are several variants of OsidObjects that indicate a more precise behavior.
- OsidObjectQuery: Defines a set of methods to query an OSID for its OsidObjects. An OsidQuery is accessed from an OsidSession.
- OsidObjectQueryInspector: Defines a set of methods to examine an OsidQuery.
- OsidObjectForm: Defines a set of methods to create and update data. OsidForms are accessed from OsidSessions.
- OsidObjectSearchOrder: Defines a set of methods to order search results. OsidSearchOrders are accessed from OsidSessions.

Most objects are or are derived from OsidObjects. Some object interfaces may not implement OsidObject but instead derive directly from interface behavioral markers. Other OsidObjects may include interface behavioral markers to indicate functionality beyond a plain object. Several categories of OsidObjects have been defined to cluster behaviors to semantically distinguish their function in the OSIDs.

• OsidCatalog: At the basic level, a catalog represents a collection of other OsidObjects. The collection may be physical or virtual and may be federated to build larger OsidCatalogs using hierarchy services. OsidCatalogs may serve as a control point to filter or constrain the OsidObjects that may be visible or created. Each OsidCatalog may have its own provider identify apart from the service provider.

- OsidRelationship: Relates two OsidObjects. The OsidRelationship represents the edge in a graph that may have its own relationship type and data. OsidRelationships are Temporal in that they have a time in which the relationship came into being and a time when the relationship ends.
- OsidRule: Defines an injection point for logic. An OsidRule may represent some constraint, evaluation, or execution. While authoring of OsidRules is outside the scope of the OSIDs, an OsidRule provides the mean to identify the rule and map it to certain OsidObjects to effect behavior of a service.

The most basic operations of an OSID center on retrieval, search, create & update, and notifications on changes to an OsidObject. The more advanced OSIDs model a system behavior where a variety of implicit relationships, constraints and rules come into play.

- OsidGovernator: Implies an activity or operation exists in the OSID Provider acting as an Operable point for a set of rules governing related OsidObjects. The OsidGovernator represents an engine of sorts in an OSID Provider and may have its own provider identity.
- OsidCompendium : OsidObjects which are reports or summaries based on transactional data managed elsewhere.

Managing data governing rules occurs in a separate set of interfaces from the effected OsidObjects (and often in a separate package). This allows for a normalized set of rules managing a small set of control points in a potentially large service.

- OsidEnabler: A managed control point to enable or disable the operation or effectiveness of another OsidObject. Enablers create a dynamic environment where behaviors and relationships can come and go based on rule evaluations.
- OsidConstrainer: A managed control point to configure the constraints on the behavior of another OsidObject.
- OsidProcessor: A managed control point to configure the behavior of another OsidObject where some kins of processing is implied.

## Other Abstract Interfaces

- OsidSearch: Defines set of methods to manage search options for performing searches.
- OsidSearchResults: Defines a set of methods to examine search results.
- OsidReceiver: Defines a set of methods invoked for asynchronous notification.
- OsidList: Defines a set of methods to sequentially access a set of objects.
- OsidNode: An interface used by hierarchy nodes.
- OsidCondition: An input or "statement of fact" into an OsidRule evaluation.
- OsidInput: An input of source data into an OsidRule processor.
- OsidResult: The output from processing an OsidRule.
- OsidRecord: An interface marker for an extension to another interface. OsidRecord are negotiated using OSID Types.
- Property: Maps a name to a value. Properties are available in OSID objects to provide a simplified view of data that may exist within a typed interface.
- PropertyList: A list of properties.

## Runtime

- OsidRuntimeProfile: The OsidProfile for the runtime OsidManager.
- OsidRuntimeManager: The OSID Runtime service.

## Abstract Flow

Generally, these definitions are abstract and not accessed directly. They are used as building blocks to define interfaces in the OSIDs themselves. OSIDs derive most of their definitions from a definition in the osid package. The methods that are defined at this abstract level versus the methods defined directly in a specific OSID is determined by the typing in the method signatures. The osid package interfaces are a means of ensuring consistency of common methods and not designed to facilitate object polymorphism among different OSIDs. A language binder may elect to alter the interface hierarchy presented in this specification and a provider need not parallel these interfaces in their implementations.

The flow of control through any OSID can be described in terms of these definitions. An OsidManager or OsidProxyManager is retrieved from the OsidRuntimeManager for a given service. Both types of managers share an interface for describing what they support in the OsidProfile.

OsidSessions are created from the OsidManager. OsidSessions tend to be organized along clusters of likefunctionality. Lookup- oriented sessions retrieve OsidObjects. Return of multiple OsidObjects is done via the OsidList. Search-oriented sessions retrieve OsidObjects through searches provided through the OsidQuery and OsidSearch interfaces.

Administrative-oriented sessions create and update OsidObjects using the OsidForm interface. The OsidForm makes available Metadata to help define its rules for setting and changing various data elements.

OsidObjects can be organized within OsidCatalogs. An OsidCatalog is hierarchical and can be traversed through an OsidNode. An OsidQuery or an OsidSearchOrder may be mapped to a dynamic OsidCatalog. Such a query may be examined using an OsidQueryInspector.

A notification session provides a means for subscribing to events, "a new object has been created", for example, and these events are received from an OsidReceiver.

## Meta OSID Specification

The OSID Specification framework defines the interace and method structures as well as the language primitives and errors used throughout the OSIDs. The OSID Specifications are defined completely in terms of interfaces and the elements specified in the meta specification.

## Language Primitives

Ths meta OSID Specification enumerates the allowable language primitives that can be used in OSID method signatures. Parameters and returns in OSID methods may be specified in terms of other OSID interfaces or using one of these primitives. An OSID Binder translates these language primitives into an appropriate language primitive counterpart.

An OSID Primitive differs from a language primitive. An OSID Primitive is an interface used to describe a more complex structure than a simple language primitive can support. Both OSID Primitives and language primitives have the same behavior in the OSIDs in that an there is no service encapsulation present allowing OSID Primitives to be consructed by an OSID Consumer.

## Errors

OSID methods are required to return a value, if specified, or return one of the errors specified in the method signature. The meta package defines the set of errors that a method signature may use.

Errors should result when the contract of the interface as been violated or cannot be fulfilled and it is necessary to disrupt the flow of control for a consumer. Different errors are specified where it is forseen that a consumer may wish to execute a different action without violating the encapsulation of internal provider operations. Such actions do not include debugging or other detailed information which is the responsibility of the provider to manage. As such, the number of errors defined across all the interfaces is kept to a minimum and the context of the error may vary from method to method in accordance with the specification.

Errors are categorized to convey the audience to which the error pertains.

- User Errors: Errors which may be the result of a user operation intended for the user.
- Operational Errors: Errors which may be the result of a system or some other problem intended for the user.

- Consumer Contract Errors: Software errors resulting in the use of the OSIDs by an OSID Consumer intended for the application programmer. These also include integration problems where the OSID Consumer bypassed a method to test for support of a service or type.
- Provider Contract Errors: Software errors in the use of an OSID by an OSID Provider intended for an implementation programmer.

## Compliance

OSID methods include a compliance statement indicating whether a method is required or optional to implement. An optional OSID method is one that defines an UNIMPLEMENTED error and there is a corresponding method to test for the existence of an implementation.

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- University of Wisconsin, Madison, O.K.I. Core Collaborator

Core Service Interface Definitions osid version 3.0.0

The Open Service Interface Definitions (OSIDs) is a service-based architecture to promote software interoperability. The OSIDs are a large suite of interface contract specifications that describe the integration points among services and system components for the purpose of creating choice among a variety of different and independently developed applications and systems, allowing independent evolution of software components within a complex system, and federated service providers.

The OSIDs were initially developed in 2001 as part of the MIT Open Knowledge Initiative Project funded by the Andrew W. Mellon Foundation to provide an architecture for higher education learning systems. OSID 3K development began in 2006 to redesign the capabilities of the specifications to apply to a much broader range of service domains and integration challenges among both small and large-scale enterprise systems.

The osid package defines the building blocks for the OSIDs which are defined in packages for their respective services. This package defines the top-level interfaces used by all the OSIDs as well as specification metadata and the OSID Runtime interface.

Meta Interfaces and Enumerations

- OSID: an enumeration listing the OSIDs defined in the specification.
- Syntax: an enumeration listing primitive types
- Metadata: an interface for describing data constraints on a data element

## Interface Behavioral Markers

Interface behavioral markers are used to tag a behavioral pattern of the interface used to construct other object interfaces.

- OsidPrimitive: marks an OSID interface used as a primitive. OSID primitives may take the form interfaces if not bound to a language primitive. Interfaces used as primitives are marked to indicate that the underlying objects may be constructed by an OSID Consumer and an OSID Provider must honor any OSID primitive regardless of its origin.
- Identifiable: Marks an interface identifiable by an OSID Id.
- Extensible: Marks an interface as extensible through OsidRecords.
- Browsable: Marks an interface as providing Property inspection for its OsidRecords.
- Suppliable: Marks an interface as accepting data from an OSID Consumer.
- Temporal: Marks an interface that has a lifetime with begin an end dates.
- Subjugateable: Mars an interface that is dependent on another object.
- Aggregateable: Marks an interface that contains other objects normally related through other services.
- Containable: Marks an interface that contains a recursive reference to itself.
- Sourceable: Marks an interface as having a provider.
- Federateable: Marks an interface that can be federated using the OSID Hierarchy pattern.
- Operable: Marks an interface as responsible for performing operatons or tasks. Operables may be enabled or disabled.

## Abstract service Interfaces

- OsidProfile: Defines interoperability methods used by OsidManagers.
- OsidManager: The entry point into an OSID and provides access to OsidSessions.
- OsidProxyManager: Another entry point into an OSID providing a means for proxying data from a middle tier application server to an underlying OSID Provider.
- OsidSession : A service interface accessible from an OsidManager that defines a set of methods for an aspect of a service.

Object-like interfaces are generally defined along lines of interoperability separating issues of data access from data management and searching. These interfaces may also implement any of the abstract behavioral interfaces listed above. The OSIDs do not adhere to a DAO/DTO model in its service definitions in that there are service methods defined on the objects (although they can be implemented using DTOs if desired). For the sake of an outline, we'll pretend they are data objects.

- OsidObject: Defines object data. OsidObjects are accessed from OsidSessions. OsidObjects are part of an interface hierarchy whose interfaces include the behavioral markers and a variety of common OsidObjects. All OsidObjects are Identifiable, Extensible, and have a Type. There are several variants of OsidObjects that indicate a more precise behavior.
- OsidObjectQuery: Defines a set of methods to query an OSID for its OsidObjects. An OsidQuery is accessed from an OsidSession.

- OsidObjectQueryInspector: Defines a set of methods to examine an OsidQuery.
- OsidObjectForm: Defines a set of methods to create and update data. OsidForms are accessed from OsidSessions.
- OsidObjectSearchOrder: Defines a set of methods to order search results. OsidSearchOrders are accessed from OsidSessions.

Most objects are or are derived from OsidObjects. Some object interfaces may not implement OsidObject but instead derive directly from interface behavioral markers. Other OsidObjects may include interface behavioral markers to indicate functionality beyond a plain object. Several categories of OsidObjects have been defined to cluster behaviors to semantically distinguish their function in the OSIDs.

- OsidCatalog: At the basic level, a catalog represents a collection of other OsidObjects. The collection may be physical or virtual and may be federated to build larger OsidCatalogs using hierarchy services. OsidCatalogs may serve as a control point to filter or constrain the OsidObjects that may be visible or created. Each OsidCatalog may have its own provider identify apart from the service provider.
- OsidRelationship: Relates two OsidObjects. The OsidRelationship represents the edge in a graph that may have its own relationship type and data. OsidRelationships are Temporal in that they have a time in which the relationship came into being and a time when the relationship ends.
- OsidRule: Defines an injection point for logic. An OsidRule may represent some constraint, evaluation, or execution. While authoring of OsidRules is outside the scope of the OSIDs, an OsidRule provides the mean to identify the rule and map it to certain OsidObjects to effect behavior of a service.

The most basic operations of an OSID center on retrieval, search, create & update, and notifications on changes to an OsidObject. The more advanced OSIDs model a system behavior where a variety of implicit relationships, constraints and rules come into play.

- OsidGovernator: Implies an activity or operation exists in the OSID Provider acting as an Operable point for a set of rules governing related OsidObjects. The OsidGovernator represents an engine of sorts in an OSID Provider and may have its own provider identity.
- OsidCompendium : OsidObjects which are reports or summaries based on transactional data managed elsewhere.

Managing data governing rules occurs in a separate set of interfaces from the effected OsidObjects (and often in a separate package). This allows for a normalized set of rules managing a small set of control points in a potentially large service.

- OsidEnabler: A managed control point to enable or disable the operation or effectiveness of another OsidObject. Enablers create a dynamic environment where behaviors and relationships can come and go based on rule evaluations.
- OsidConstrainer: A managed control point to configure the constraints on the behavior of another OsidObject.
- OsidProcessor: A managed control point to configure the behavior of another OsidObject where some kins of processing is implied.

## Other Abstract Interfaces

- OsidSearch: Defines set of methods to manage search options for performing searches.
- OsidSearchResults: Defines a set of methods to examine search results.
- OsidReceiver: Defines a set of methods invoked for asynchronous notification.
- OsidList: Defines a set of methods to sequentially access a set of objects.
- OsidNode: An interface used by hierarchy nodes.
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# **Service Managers**

## **Osid Manager**

class dlkit.services.osid.OsidManager

Bases: dlkit.services.osid.OsidProfile

The OsidManager is the top level interface for all OSID managers.

An OSID manager is instantiated through the OsidRuntimeManager and represents an instance of a service. An OSID manager is responsible for implementing a profile for a service and creating sessions that, in general, correspond to the profile. An application need only create a single OsidManager per service and implementors must ensure the OsidManager is thread-safe ". The ``OsidSessions spawned from an OSID manager are dedicated to single processing threads. The OsidManager defines methods in common throughout all OSID managers which implement this interface.

### initialize(runtime)

Initializes this manager.

A manager is initialized once at the time of creation.

Parameters runtime (osid.OsidRuntimeManager) - the runtime environment

Raise ConfigurationError – an error with implementation configuration

Raise IllegalState - this manager has already been initialized by the OsidRuntime

Raise NullArgument - runtime is null

Raise OperationFailed - unable to complete request

*compliance: mandatory* – *This method must be implemented. implementation notes*: In addition to loading its runtime configuration an implementation may create shared resources such as connection pools to be shared among all sessions of this service and released when this manager is closed. Providers must thread-protect any data stored in the manager. To maximize interoperability, providers should not honor a second call to initialize() and must set an IllegalState error.

## rollback\_service(rollback\_time)

Rolls back this service to a point in time.

**Parameters rollback\_time** (timestamp) – the requested time

Returns the journal entry corresponding to the actual state of this service

**Return type** osid.journaling.JournalEntry

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

Raise Unimplemented - supports\_journal\_rollback() is false

compliance: mandatory – This method must be implemented.

### change\_branch(branch\_id)

Changes the service branch.

Parameters branch\_id (osid.id.Id) - the new service branch

Raise NotFound-branch\_id not found

**Raise** NullArgument - branch\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure occurred

**Raise** Unimplemented - supports\_journal\_branching() is false

compliance: mandatory – This method must be implemented.

## **Osid Proxy Manager**

```
class dlkit.services.osid.OsidProxyManager
```

 $Bases: {\tt dlkit.services.osid.OsidProfile}$ 

The OsidProxyManager is the top level interface for all OSID proxy managers.

A proxy manager accepts parameters to pass through end-user authentication credentials and other necessary request parameters in a server environment. Native applications should use an OsidManager to maintain a higher degree of interoperability by avoiding this coupling.

An OSID proxy manager is instantiated through the OsidRuntimeManager and represents an instance of a service. An OSID manager is responsible for defining clusters of interoperability within a service and creating sessions that generally correspond to these clusters, An application need only create a single OsidProxyManager per service and implementors must ensure the OsidProxyManager is thread-safe ". The ``OsidSessions spawned from an OSID manager are dedicated to single processing threads. The OsidProxyManager defines methods in common throughout all OSID managers which implement this interface.

#### initialize(runtime)

Initializes this manager.

A manager is initialized once at the time of creation.

Parameters runtime (osid.OsidRuntimeManager) - the runtime environment

**Raise** ConfigurationError – an error with implementation configuration

Raise IllegalState - this manager has already been initialized by the OsidRuntime

Raise NullArgument - runtime is null

**Raise** OperationFailed – unable to complete request

*compliance: mandatory* – *This method must be implemented. implementation notes*: In addition to loading its runtime configuration an implementation may create shared resources such as connection pools to be shared among all sessions of this service and released when this manager is closed. Providers must thread-protect any data stored in the manager. To maximize interoperability, providers should not honor a second call to initialize() and must set an IllegalState error.

## rollback\_service (rollback\_time, proxy)

Rolls back this service to a point in time.

### Parameters

- rollback\_time (timestamp) the requested time
- proxy (osid.proxy.Proxy) a proxy

**Returns** the journal entry corresponding to the actual state of this service

Return type osid.journaling.JournalEntry

Raise NullArgument - proxy is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

Raise Unimplemented - supports\_journal\_rollback() is false

compliance: mandatory – This method must be implemented.

change\_branch(branch\_id, proxy)

Changes the service branch.

### **Parameters**

- branch\_id (osid.id.Id) the new service branch
- proxy (osid.proxy.Proxy) a proxy

Raise NotFound - branch\_id not found

**Raise** NullArgument - branch\_id or proxy is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure occurred

Raise Unimplemented - supports\_journal\_branching() is false

compliance: mandatory – This method must be implemented.

## **Osid Runtime Profile**

```
class dlkit.services.osid.OsidRuntimeProfile
```

Bases: dlkit.services.osid.OsidProfile

The OsidRuntimeProfile defines the service aspects of the OSID runtime service.

#### supports\_configuration()

Tests if a configuration service is provided within this runtime environment.

Returns true if a configuration service is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## **Osid Runtime Manager**

dlkit.services.osid.

The OsidRuntimeManager represents and OSID platform and contains the information required for running OSID implementations such as search paths and configurations.

#### get\_manager (osid, impl\_class\_name, version)

Finds, loads and instantiates providers of OSID managers.

Providers must conform to an OsidManager interface. The interfaces are defined in the OSID enumeration. For all OSID requests, an instance of OsidManager that implements the OsidManager interface is returned. In bindings where permitted, this can be safely cast into the requested manager.

## Parameters

- **osid** (osid.OSID) represents the OSID
- impl\_class\_name (string) the name of the implementation
- **version** (osid.installation.Version) the minimum required OSID specification version

**Returns** the manager of the service

Return type osid.OsidManager

Raise ConfigurationError – an error in configuring the implementation

Raise NotFound - the implementation class was not found

Raise NullArgument - impl\_class\_name or version is null

Raise OperationFailed - unable to complete request

Raise Unsupported - impl\_class\_name does not support the requested OSID

*compliance: mandatory – This method must be implemented. implementation notes:* After finding and instantiating the requested OsidManager, providers must invoke OsidManager. initialize(OsidRuntimeManager) where the environment is an instance of the current environment that includes the configuration for the service being initialized. The OsidRuntimeManager passed may include information useful for the configuration such as the identity of the service being instantiated.

## get\_proxy\_manager(osid, implementation, version)

Finds, loads and instantiates providers of OSID managers.

Providers must conform to an OsidManager interface. The interfaces are defined in the OSID enumeration. For all OSID requests, an instance of OsidManager that implements the OsidManager interface is returned. In bindings where permitted, this can be safely cast into the requested manager.

### Parameters

- **osid** (osid.OSID) represents the OSID
- implementation (string) the name of the implementation
- **version** (osid.installation.Version) the minimum required OSID specification version

**Returns** the manager of the service

Return type osid.OsidProxyManager

**Raise** ConfigurationError – an error in configuring the implementation

Raise NotFound - the implementation class was not found

**Raise** NullArgument - implementation or version is null

Raise OperationFailed - unable to complete request

Raise Unsupported - implementation does not support the requested OSID

*compliance: mandatory – This method must be implemented. implementation notes:* After finding and instantiating the requested OsidManager, providers must invoke OsidManager. initialize(OsidRuntimeManager) where the environment is an instance of the current environment that includes the configuration for the service being initialized. The OsidRuntimeManager passed may include information useful for the configuration such as the identity of the service being instantiated.

#### configuration

Gets the current configuration in the runtime environment.

Returns a configuration

Return type osid.configuration.ValueLookupSession

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - an authorization failure occured

Raise Unimplemented – a configuration service is not supported

compliance: optional – This method must be implemented if ''supports\_configuration()'' is ''true''.

# **Objects**

# **Osid Object**

## class dlkit.osid.objects.OsidObject

Bases: dlkit.osid.markers.Identifiable, dlkit.osid.markers.Extensible, dlkit. osid.markers.Browsable

OsidObject is the top level interface for all OSID Objects.

An OSID Object is an object identified by an OSID Id and may implements optional interfaces. OSID Objects also contain a display name and a description. These fields are required but may be used for a variety of purposes ranging from a primary name and description of the object to a more user friendly display of various attributes.

Creation of OSID Objects and the modification of their data is managed through the associated OsidSession which removes the dependency of updating data elements upon object retrieval. The OsidManager should be used to test if updates are available and determine what PropertyTypes are supported. The OsidManager is also used to create the appropriate OsidSession for object creation, updates and deletes.

All OsidObjects are identified by an immutable Id. An Id is assigned to an object upon creation of the object and cannot be changed once assigned.

An OsidObject may support one or more supplementary records which are expressed in the form of interfaces. Each record interface is identified by a Type. A record interface may extend another record interface where support of the parent record interface is implied. In this case of interface inheritance, support of the parent record type may be implied through has\_record\_type() and not explicit in getRecordTypes().

For example, if recordB extends recordA, typeB is a child of typeA. If a record implements typeB, than it also implements typeA. An application that only knows about typeA retrieves recordA. An application that knows about typeB, retrieves recordB which is the union of methods specified in typeA and typeB. If an application requests typeA, it may not attempt to access methods defined in typeB as they may not exist until explicitly requested. The mechanics of this polymorphism is defined by the language binder. One mechanism might be the use of casting.

In addition to the record Types, OSID Objects also have a genus Type. A genus Type indicates a classification or kind of the object where an "is a" relationship exists. The purpose of of the genus Type is to avoid the creation of unnecessary record types that may needlessly complicate an interface hierarchy or introduce interoperability issues. For example, an OSID object may have a record Type of Publication that defines methods pertinent to publications, such as an ISBN number. A provider may wish to distinguish between books and journals without having the need of new record interfaces. In this case, the genus Type may be one of Book or Journal. While this distinction can aid a search, these genres should be treated in such a way that do not introduce interoperability problems.

Like record Types, the genus Types may also exist in an implicit type hierarchy. An OSID object always has at least one genus. Genus types should not be confused with subject tagging, which is managed externally to the object. Unlike record Types, an object's genus may be modified. However, once an object's record is created with a record Type, it cannot be changed.

Methods that return values are not permitted to return nulls. If a value is not set, it is indicated in the Metadata of the update form.

### display\_name

Gets the preferred display name associated with this instance of this OSID object appropriate for display to the user.

Returns the display name

Return type osid.locale.DisplayText

*compliance: mandatory* – *This method must be implemented. implementation notes*: A display name is a string used for identifying an object in human terms. A provider may wish to initialize the display name based on one or more object attributes. In some cases, the display name may not map to a specific or significant object attribute but simply be used as a preferred display name that can be modified. A provider may also wish to translate the display name into a specific locale using the Locale service. Some OSIDs define methods for more detailed naming.

#### description

Gets the description associated with this instance of this OSID object.

Returns the description

Return type osid.locale.DisplayText

*compliance: mandatory* – *This method must be implemented. implementation notes*: A description is a string used for describing an object in human terms and may not have significance in the underlying system. A provider may wish to initialize the description based on one or more object attributes and/or treat it as an auxiliary piece of data that can be modified. A provider may also wish to translate the description into a specific locale using the Locale service.

### genus\_type

Gets the genus type of this object.

**Returns** the genus type of this object

Return type osid.type.Type

compliance: mandatory – This method must be implemented.

### is\_of\_genus\_type (genus\_type)

Tests if this object is of the given genus Type.

The given genus type may be supported by the object through the type hierarchy.

Parameters genus\_type (osid.type.Type) - a genus type

Returns true if this object is of the given genus Type, false otherwise

Return type boolean

Raise NullArgument - genus\_type is null

compliance: mandatory – This method must be implemented.

## **Osid Relationship**

class dlkit.osid.objects.OsidRelationship

Bases: dlkit.osid.objects.OsidObject, dlkit.osid.markers.Temporal

A Relationship associates two OSID objects.

Relationships are transient. They define a date range for which they are in effect.

Unlike other OsidObjects that rely on the auxiliary Journaling OSID to track variance over time, OsidRelationships introduce a different concept of time independent from journaling. For example, in the present, a student was registered in a course and dropped it. The relationship between the student and the

course remains pertinent, independent of any journaled changes that may have occurred to either the student or the course.

Once the student has dropped the course, the relationship has expired such that is\_effective() becomes false. It can be inferred that during the period of the effective dates, the student was actively registered in the course. Here is an example:

- •T1. September 1: Student registers for course for grades
- •T2. September 10: Student drops course
- •T3. September 15: Student re-registers for course pass/fail
- **The relationships are:** T1. R1 {effective, September 1 -> end of term, data=grades} T2. R1 {ineffective, September 1 -> September 10, data=grades} T3. R1 {ineffective, September 1 -> September 10, data=grades}
  - R2 {effective, September 10 -> end of term, data=p/f}

An OSID Provider may also permit dates to be set in the future in which case the relationship can become automatically become effective at a future time and later expire. More complex effectiveness management can be done through other rule-based services.

OSID Consumer lookups and queries of relationships need to consider that it may be only effective relationships are of interest.

#### has\_end\_reason()

Tests if a reason this relationship came to an end is known.

**Returns** true if an end reason is available, false otherwise

Return type boolean

**Raise** IllegalState - is\_effective() is true

compliance: mandatory – This method must be implemented.

### end\_reason\_id

Gets a state Id indicating why this relationship has ended.

Returns a state  $\operatorname{Id}$ 

Return type osid.id.Id

Raise IllegalState - has\_end\_reason() is false

*compliance: mandatory – This method must be implemented.* 

#### end\_reason

Gets a state indicating why this relationship has ended.

**Returns** a state

Return type osid.process.State

Raise IllegalState - has\_end\_reason() is false

Raise OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

## **Osid Catalog**

class dlkit.osid.objects.OsidCatalog

**Bases:** dlkit.osid.objects.OsidObject, dlkit.osid.markers.Sourceable, dlkit. osid.markers.Federateable

OsidCatalog is the top level interface for all OSID catalog-like objects.

A catalog relates to other OSID objects for the purpose of organization and federation and almost always are hierarchical. An example catalog is a Repository that relates to a collection of Assets.

OsidCatalogs allow for the retrieval of a provider identity and branding.

Collections visible through an OsidCatalog may be the output of a dynamic query or some other rules-based evaluation. The facts surrounding the evaluation are the OsidObjects visible to the OsidCatalog from its position in the federated hierarchy. The input conditions may satisifed on a service-wide basis using an OsidQuery or environmental conditions supplied to the services via a Proxy.

Often, the selection of an OsidCatalog in instantiating an OsidSession provides access to a set of OsidObjects. Because the view inside an OsidCatalog can also be produced behaviorally using a rules evaluation, the Id (or well-known alias) of the OsidCatalog may be used as an abstract means of requesting a predefined set of behaviors or data constraints from an OSID Provider.

The flexibility of interpretation together with its central role in federation to build a rich and complex service from a set of individual OSID Providers makes cataloging an essential pattern to achieve abstraction from implementations in the OSIDs without loss of functionality. Most OSIDs include a cataloging pattern.

## **Osid Rule**

#### class dlkit.osid.objects.OsidRule

Bases: dlkit.osid.objects.OsidObject, dlkit.osid.markers.Operable

An OsidRule identifies an explicit or implicit rule evaluation.

An associated Rule may be available in cases where the behavior of the object can be explicitly modified using a defined rule. In many cases, an OsidObject may define specific methods to manage certain common behavioral aspects and delegate anything above and beyond what has been defined to a rule evaluation.

Rules are defined to be operable. In the case of a statement evaluation, an enabled rule overrides any evaluation to return true and a disabled rule overrides any evaluation to return false.

Rules are never required to consume or implement. They serve as a mechanism to offer a level of management not attainable in the immediate service definition. Each Rule implies evaluating a set of facts known to the service to produce a resulting beavior. Rule evaluations may also accept input data or conditions, however, OsidRules as they appear in throughout the services may or may not provide a means of supplying OsidConditions directly. In the services where an explicit OsidCondition is absent they may be masquerading as another interface such as a Proxy or an OsidQuery.

### has\_rule()

Tests if an explicit rule is available.

**Returns** true if an explicit rule is available, false otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

#### rule\_id

Gets the explicit rule Id.

Returns the rule  ${\tt Id}$ 

Return type osid.id.Id

**Raise** IllegalState - has\_rule() is false

compliance: mandatory – This method must be implemented.

#### rule

Gets the explicit rule.

**Returns** the rule

Return type osid.rules.Rule

Raise IllegalState - has\_rule() is false

**Raise** OperationFailed – unable to complete request

*compliance: mandatory – This method must be implemented.* 

## **Osid Enabler**

### class dlkit.osid.objects.OsidEnabler

Bases: dlkit.osid.objects.OsidRule, dlkit.osid.markers.Temporal

OsidEnabler is used to manage the effectiveness, enabledness, or operation of an OsidObejct.

The OsidEnabler itself is active or inactive When an OsidEnabler is active, any OsidObject mapped to it is "on." When all OsidEnablers mapped to an OsidObject are inactive, then the OsidObject is "off."

The managed OsidObject may have varying semantics as to what its on/off status means and in particular, which methods are used to indicate the effect of an OsidEnabler. Some axamples:

•Operables: OsidEnablers effect the operational status.

•Temporals: OsidEnablers may be used to extend or shorten the effectiveness of a Temporal such as an OsidRelationship.

In the case where an OsidEnabler may cause a discontinuity in a Temporal, the OsidEnabler may cause the creation of new Temporals to capture the gap in effectiveness.

For example, An OsidRelationship that began in 2007 may be brought to an end in 2008 due to the absence of any active OsidEnablers. When an effective OsidEnabler appears in 2009, a new OsidRelationship is created with a starting effective date of 2009 leaving the existing OsidRelationship with effective dates from 2007 to 2008.

An OsidEnabler itself is both a Temporal and an OsidRule whose activity status of the object may be controlled administratively, using a span of effective dates, through an external rule, or all three. The OsidEnabler defines a set of canned rules based on dates, events, and cyclic events.

### is\_effective\_by\_schedule()

Tests if the effectiveness of the enabler is governed by a Schedule.

If a schedule exists, it is bounded by the effective dates of this enabler. If is\_effective\_by\_schedule() is true, is\_effective\_by\_event() and is\_effective\_by\_cyclic\_event() must be false.

**Returns** true if the enabler is governed by schedule, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### schedule\_id

Gets the schedule Id.

Returns the schedule Id

Return type osid.id.Id

Raise IllegalState - is\_effective\_by\_schedule() is false

compliance: mandatory – This method must be implemented.

# schedule

Gets the schedule.

Returns the schedule

Return type osid.calendaring.Schedule

**Raise** IllegalState - is\_effective\_by\_schedule() is false

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

### is\_effective\_by\_event()

Tests if the effectiveness of the enabler is governed by an Event such that the start and end dates of the event govern the effectiveness.

The event may also be a RecurringEvent in which case the enabler is effective for start and end dates of each event in the series If an event exists, it is bounded by the effective dates of this enabler. If is\_effective\_by\_event() is true, is\_effective\_by\_schedule() and is\_effective\_by\_cyclic\_event() must be false.

**Returns** true if the enabler is governed by an event, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### event\_id

Gets the event Id.

Returns the event Id

Return type osid.id.Id

**Raise** IllegalState - is\_effective\_by\_event() is false

compliance: mandatory – This method must be implemented.

#### event

Gets the event.

Returns the event

Return type osid.calendaring.Event

**Raise** IllegalState - is\_effective\_by\_event() is false

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

## is\_effective\_by\_cyclic\_event()

Tests if the effectiveness of the enabler is governed by a CyclicEvent.

```
If a cyclic event exists, it is evaluated by the accompanying cyclic time period. If is_effective_by_cyclic_event() is true, is_effective_by_schedule() and is_effective_by_event() must be false.
```

**Returns** true if the enabler is governed by a cyclic event, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## cyclic\_event\_id

Gets the cyclic event Id.

Returns the cyclic event Id

Return type osid.id.Id

Raise IllegalState - is\_effective\_by\_cyclic\_event() is false

compliance: mandatory – This method must be implemented.

#### cyclic\_event

Gets the cyclic event.

Returns the cyclic event

Return type osid.calendaring.cycle.CyclicEvent

**Raise** IllegalState - is\_effective\_by\_cyclic\_event() is false

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

### is\_effective\_for\_demographic()

Tests if the effectiveness of the enabler applies to a demographic resource.

**Returns** true if the rule apples to a demographic. false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### demographic\_id

Gets the demographic resource Id.

**Returns** the resource Id

Return type osid.id.Id

**Raise** IllegalState - is\_effective\_for\_demographic() is false

compliance: mandatory – This method must be implemented.

#### demographic

Gets the demographic resource.

**Returns** the resource representing the demographic

Return type osid.resource.Resource

Raise IllegalState - is\_effective\_for\_demographic() is false

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

## **Osid Constrainer**

```
class dlkit.osid.objects.OsidConstrainer
```

Bases: dlkit.osid.objects.OsidRule

An OsidConstrainer marks an interface as a control point to constrain another object.

A constrainer may define specific methods to describe the constrainment or incorporate external logic using a rule.

## **Osid Processor**

```
class dlkit.osid.objects.OsidProcessor
```

Bases: dlkit.osid.objects.OsidRule

An OsidProcessor is an interface describing the operation of another object.

A processor may define specific methods to manage processing, or incorporate external logic using a rule.

## **Osid Governator**

### class dlkit.osid.objects.OsidGovernator

Bases: dlkit.osid.objects.OsidObject, dlkit.osid.markers.Operable, dlkit.osid. markers.Sourceable

An OsidGovernator is a control point to govern the behavior of a service.

OsidGovernators generally indicate the presence of OsidEnablers and other rule governing interfaces to provide a means of managing service operations and constraints from a "behind the scenes" perspective. The OsidGovernator is a focal point for these various rules.

OsidGovernators are Sourceable. An OsidGovernator implies a governance that often corresponds to a provider of a process as opposed to a catalog provider of OsidObjects.

OsidGovernators are Operable. They indicate an active and operational status and related rules may be administratively overridden using this control point. Administratively setting the enabled or disabled flags in the operator overrides any enabling rule mapped to this OsidGovernator.

## **Osid Compendium**

#### class dlkit.osid.objects.OsidCompendium

Bases: dlkit.osid.objects.OsidObject, dlkit.osid.markers.Subjugateable

OsidCompendium is the top level interface for reports based on measurements, calculations, summaries, or views of transactional activity within periods of time.

This time dimension of this report may align with managed time periods, specific dates, or both. Oh my.

Reports are often derived dynamically based on an examination of data managed elsewhere in an OSID. Reports may also be directly managed outside where it is desirable to capture summaries without the detail of the implied evaluated data. The behavior of a direct create or update of a report is not specified but is not limited to an override or a cascading update of underlying data.

The start and end date represents the date range used in the evaluation of the transactional data on which this report is based. The start and end date may be the same indicating that the evaluation occurred at a point in time rather than across a date range. The start and end date requested may differ from the start and end date indicated in this report because of the inability to interpolate or extrapolate the date. These dates should be examined to understand what actually occurred and to what dates the information in this report pertains.

These dates differ from the dates the report itself was requested, created, or modified. The dates refer to the context of the evaluation. In a managed report, the dates are simply the dates to which the report information pertains. The history of a single report may be examined in the Journaling OSID.

For example, the Location of a Resource at 12:11pm is reported to be in Longwood and at 12:23pm is reported to be at Chestnut Hill. A request of a ResourceLocation. A data correction may update the Longwood time to be 12:09pm. The update of the ResourceLocation from 12:11pm to 12:09pm may be examined in the Journaling OSID while the 12:11pm time would not longer be visible in current versions of this report.

Reports may be indexed by a managed time period such as a Term or FiscalPeriod. The evaluation dates may map to the opening and closing dates of the time period. Evaluation dates that differ from the time period may indicate that the transactional data is incomplete for that time period or that the report was calculated using a requested date range.

OsidCompendiums are subjugates to other OsidObjects in that what is reported is tied to an instance of a dimension such as a person, account, or an OsidCatalog.

### start\_date

Gets the start date used in the evaluation of the transactional data on which this report is based.

Returns the date

Return type osid.calendaring.DateTime

compliance: mandatory – This method must be implemented.

#### end\_date

Gets the end date used in the evaluation of the transactional data on which this report is based.

**Returns** the date

Return type osid.calendaring.DateTime

compliance: mandatory – This method must be implemented.

## is\_interpolated()

Tests if this report is interpolated within measured data or known transactions.

Interpolation may occur if the start or end date fall between two known facts or managed time period.

**Returns** true if this report is interpolated, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### is\_extrapolated()

Tests if this report is extrapolated outside measured data or known transactions.

Extrapolation may occur if the start or end date fall outside two known facts or managed time period. Extrapolation may occur within a managed time period in progress where the results of the entire time period are projected.

**Returns** true if this report is extrapolated, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## **Osid Capsule**

class dlkit.osid.objects.OsidCapsule OsidCapsule wraps other objects. The interface has no meaning other than to return a set of semantically unrelated objects from a method.

## **Osid Form**

#### class dlkit.osid.objects.OsidForm

## Bases: dlkit.osid.markers.Identifiable, dlkit.osid.markers.Suppliable

The OsidForm is the vehicle used to create and update objects.

The form is a container for data to be sent to an update or create method of a session. Applications should persist their own data until a form is successfully submitted in an update or create transaction.

The form may provide some feedback as to the validity of certain data updates before the update transaction is issued to the corresponding session but a successful modification of the form is not a guarantee of success for the update transaction. A consumer may elect to perform all updates within a single update transaction or break up a large update intio smaller units. The tradeoff is the granularity of error feedback vs. the performance gain of a single transaction.

OsidForms are Identifiable. The Id of the OsidForm is used to uniquely identify the update or create transaction and not that of the object being updated. Currently, it is not necessary to have these Ids persisted.

As with all aspects of the OSIDs, nulls cannot be used. Methods to clear values are also defined in the form.

A new OsidForm should be acquired for each transaction upon an OsidObject. Forms should not be reused from one object to another even if the supplied data is the same as the forms may encapsulate data specific to the object requested. Example of changing a display name and a color defined in a color interface extension:

ObjectForm form = session.getObjectFormForUpdate(objectId); form.setDisplayName("new name"); ColorForm recordForm = form.getFormRecord(colorRecordType); record-Form.setColor("green"); session.updateObject(objectId, form);

#### is\_for\_update()

Tests if this form is for an update operation.

**Returns** true if this form is for an update operation, false if for a create operation

Return type boolean

compliance: mandatory – This method must be implemented.

### default\_locale

Gets a default locale for DisplayTexts when a locale is not specified.

Returns the default locale

Return type osid.locale.Locale

compliance: mandatory – This method must be implemented.

### locales

Gets a list of locales for available DisplayText translations that can be performed using this form.

**Returns** a list of available locales or an empty list if no translation operations are available

Return type osid.locale.LocaleList

compliance: mandatory – This method must be implemented.

## set\_locale(language\_type, script\_type)

Specifies a language and script type for DisplayText fields in this form.

Setting a locale to something other than the default locale may affect the Metadata in this form.

If multiple locales are available for managing translations, the Metadata indicates the fields are unset as they may be returning a defeult value based on the default locale.

### **Parameters**

- language\_type (osid.type.Type) the language type
- script\_type (osid.type.Type) the script type

**Raise** NullArgument - language\_type or script\_type is null

Raise Unsupported - language\_type and script\_type not available from
 get\_locales()

compliance: mandatory – This method must be implemented.

#### journal\_comment\_metadata

Gets the metadata for the comment corresponding to this form submission.

The comment is used for describing the nature of the change to the corresponding object for the purposes of logging and auditing.

Returns metadata for the comment

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

#### journal\_comment

is\_valid()

Tests if ths form is in a valid state for submission.

A form is valid if all required data has been supplied compliant with any constraints.

Returns false if there is a known error in this form, true otherwise

Return type boolean

Raise OperationFailed – attempt to perform validation failed

compliance: mandatory – This method must be implemented.

### validation\_messages

Gets text messages corresponding to additional instructions to pass form validation.

**Returns** a list of messages

Return type osid.locale.DisplayText

compliance: mandatory – This method must be implemented.

#### invalid\_metadata

Gets a list of metadata for the elements in this form which are not valid.

**Returns** invalid metadata

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

## **Osid Identifiable Form**

class dlkit.osid.objects.OsidIdentifiableForm

Bases: dlkit.osid.objects.OsidForm

The OsidIdentifiableForm is used to create and update identifiable objects.

The form is a container for data to be sent to an update or create method of a session.

## **Osid Extensible Form**

class dlkit.osid.objects.OsidExtensibleForm

Bases: dlkit.osid.objects.OsidForm, dlkit.osid.markers.Extensible

The OsidExtensibleForm is used to create and update extensible objects.

The form is a container for data to be sent to an update or create method of a session.

### required\_record\_types

Gets the required record types for this form.

The required records may change as a result of other data in this form and should be checked before submission.

Returns a list of required record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

## **Osid Browsable Form**

class dlkit.osid.objects.OsidBrowsableForm

Bases: dlkit.osid.objects.OsidForm

The OsidBrowsableForm is used to create and update browsable objects.

The form is a container for data to be sent to an update or create method of a session.

## **Osid Temporal Form**

class dlkit.osid.objects.OsidTemporalForm
 Bases: dlkit.osid.objects.OsidForm

This form is used to create and update temporals.

### start\_date\_metadata

Gets the metadata for a start date.

Returns metadata for the date

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

## start\_date

### end\_date\_metadata

Gets the metadata for an end date.

Returns metadata for the date

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

end\_date

## **Osid Subjugateable Form**

class dlkit.osid.objects.OsidSubjugateableForm Bases: dlkit.osid.objects.OsidForm

This form is used to create and update dependent objects.

## **Osid Aggregateable Form**

class dlkit.osid.objects.OsidAggregateableForm Bases: dlkit.osid.objects.OsidForm

This form is used to create and update assemblages.

## **Osid Containable Form**

```
class dlkit.osid.objects.OsidContainableForm
    Bases: dlkit.osid.objects.OsidForm
```

This form is used to create and update containers.

### sequestered\_metadata

Gets the metadata for the sequestered flag.

Returns metadata for the sequestered flag

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

sequestered

## **Osid Sourceable Form**

```
class dlkit.osid.objects.OsidSourceableForm
Bases: dlkit.osid.objects.OsidForm
```

This form is used to create and update sourceables.

## provider\_metadata

Gets the metadata for a provider.

**Returns** metadata for the provider

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

## provider

# branding\_metadata

Gets the metadata for the asset branding.

Returns metadata for the asset branding.

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

## branding

#### license\_metadata

Gets the metadata for the license.

Returns metadata for the license

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

license\_

## **Osid Federateable Form**

class dlkit.osid.objects.OsidFederateableForm Bases: dlkit.osid.objects.OsidForm

This form is used to create and update federateables.

## **Osid Operable Form**

```
class dlkit.osid.objects.OsidOperableForm
    Bases: dlkit.osid.objects.OsidForm
```

This form is used to create and update operables.

#### enabled\_metadata

Gets the metadata for the enabled flag.

Returns metadata for the enabled flag

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

### enabled

### disabled\_metadata

Gets the metadata for the disabled flag.

Returns metadata for the disabled flag

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

#### disabled

## **Osid Object Form**

### class dlkit.osid.objects.OsidObjectForm

Bases: dlkit.osid.objects.OsidIdentifiableForm, dlkit.osid.objects. OsidExtensibleForm, dlkit.osid.objects.OsidBrowsableForm

The OsidObjectForm is used to create and update OsidObjects.

The form is not an OsidObject but merely a container for data to be sent to an update or create method of a session. A provider may or may not combine the OsidObject and OsidObjectForm interfaces into a single object.

Generally, a set method parallels each get method of an OsidObject. Additionally, Metadata may be examined for each data element to assist in understanding particular rules concerning acceptable data.

The form may provide some feedback as to the validity of certain data updates before the update transaction is issued to the corresponding session but a successful modification of the form is not a guarantee of success for the update transaction. A consumer may elect to perform all updates within a single update transaction or break up a large update intio smaller units. The tradeoff is the granularity of error feedback vs. the performance gain of a single transaction.

As with all aspects of the OSIDs, nulls cannot be used. Methods to clear values are also defined in the form.

A new OsidForm should be acquired for each transaction upon an OsidObject. Forms should not be reused from one object to another even if the supplied data is the same as the forms may encapsulate data specific to the object requested. Example of changing a display name and a color defined in a color interface extension:

ObjectForm form = session.getObjectFormForUpdate(objectId); form.setDisplayName("new name"); ColorForm recordForm = form.getFormRecord(colorRecordType); record-Form.setColor("green"); session.updateObject(objectId, form);

#### display\_name\_metadata

Gets the metadata for a display name.

**Returns** metadata for the display name

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

display\_name

description\_metadata

Gets the metadata for a description.

Returns metadata for the description

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

### description

#### genus\_type\_metadata

Gets the metadata for a genus type.

**Returns** metadata for the genus

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

genus\_type

### **Osid Relationship Form**

class dlkit.osid.objects.OsidRelationshipForm
Bases: dlkit.osid.objects.OsidObjectForm, dlkit.osid.objects.OsidTemporalForm

This form is used to create and update relationshps.

## **Osid Catalog Form**

class dlkit.osid.objects.OsidCatalogForm

Bases: dlkit.osid.objects.OsidObjectForm, dlkit.osid.objects. OsidSourceableForm, dlkit.osid.objects.OsidFederateableForm

This form is used to create and update catalogs.

## **Osid Rule Form**

class dlkit.osid.objects.OsidRuleForm

Bases: dlkit.osid.objects.OsidObjectForm, dlkit.osid.objects.OsidOperableForm

This form is used to create and update rules.

#### rule\_metadata

Gets the metadata for an associated rule.

**Returns** metadata for the rule

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

rule

## **Osid Enabler Form**

## class dlkit.osid.objects.OsidEnablerForm

Bases: dlkit.osid.objects.OsidRuleForm, dlkit.osid.objects.OsidTemporalForm

This form is used to create and update enablers.

## schedule\_metadata

Gets the metadata for an associated schedule.

Returns metadata for the schedule

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

## schedule

### event\_metadata

Gets the metadata for an associated event.

Returns metadata for the event

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

#### event

cyclic\_event\_metadata

Gets the metadata for the cyclic event.

Returns metadata for the cyclic event

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

cyclic\_event

## demographic\_metadata

Gets the metadata for an associated demographic.

Returns metadata for the resource.

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

### demographic

## **Osid Constrainer Form**

class dlkit.osid.objects.OsidConstrainerForm Bases: dlkit.osid.objects.OsidRuleForm

This form is used to create and update constrainers.

## **Osid Processor Form**

class dlkit.osid.objects.OsidProcessorForm Bases: dlkit.osid.objects.OsidRuleForm

This form is used to create and update processors.

## **Osid Governator Form**

class dlkit.osid.objects.OsidGovernatorForm
Bases: dlkit.osid.objects.OsidObjectForm, dlkit.osid.objects.OsidOperableForm,
dlkit.osid.objects.OsidSourceableForm

This form is used to create and update governators.

## **Osid Compendium Form**

class dlkit.osid.objects.OsidCompendiumForm

Bases: dlkit.osid.objects.OsidObjectForm, OsidSubjugateableForm dlkit.osid.objects.

This form is used to create and update governators.

## start\_date\_metadata

Gets the metadata for a start date.

Returns metadata for the date

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

## start\_date

### end\_date\_metadata

Gets the metadata for an end date.

Returns metadata for the date

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

### end\_date

### interpolated\_metadata

Gets the metadata for the interpolated flag.

Returns metadata for the interpolated flag

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

### interpolated

# extrapolated\_metadata

Gets the metadata for the extrapolated flag.

**Returns** metadata for the extrapolated flag

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

## extrapolated

## **Osid Capsule Form**

class dlkit.osid.objects.OsidCapsuleForm Bases: dlkit.osid.objects.OsidForm

This form is used to create and update capsules.

## **Osid List**

#### class dlkit.osid.objects.OsidList

OsidList is the top-level interface for all OSID lists.

An OSID list provides sequential access, one at a time or many at a time, access to a set of elements. These elements are not required to be OsidObjects but generally are. The element retrieval methods are defined in the sub-interface of OsidList where the appropriate return type is defined.

Osid lists are a once pass through iteration of elements. The size of the object set and the means in which the element set is generated or stored is not known. Assumptions based on the length of the element set by copying the entire contents of the list into a fixed buffer should be done with caution a awareness that an implementation may return a number of elements ranging from zero to infinity.

Lists are returned by methods when multiple return values are possible. There is no guarantee that successive calls to the same method will return the same set of elements in a list. Unless an order is specified in an interface definition, the order of the elements is not known.

#### has\_next()

Tests if there are more elements in this list.

**Returns** true if more elements are available in this list, false if the end of the list has been reached

### Return type boolean

*compliance: mandatory – This method must be implemented. implementation notes:* Any errors that may result from accessing the underlying set of elements are to be deferred until the consumer attempts retrieval in which case the provider must return true for this method.

#### available()

Gets the number of elements available for retrieval.

The number returned by this method may be less than or equal to the total number of elements in this list. To determine if the end of the list has been reached, the method has\_next() should be used. This method conveys what is known about the number of remaining elements at a point in time and can be used to determine a minimum size of the remaining elements, if known. A valid return is zero even if has\_next() is true.

This method does not imply asynchronous usage. All OSID methods may block.

Returns the number of elements available for retrieval

Return type cardinal

*compliance: mandatory* – *This method must be implemented. implementation notes*: Any errors that may result from accessing the underlying set of elements are to be deferred until the consumer attempts retrieval in which case the provider must return a positive integer for this method so the consumer can continue execution to receive the error. In all other circumstances, the provider must not return a number greater than the number of elements known since this number will be fed as a parameter to the bulk retrieval method.

skip(n)

Skip the specified number of elements in the list.

If the number skipped is greater than the number of elements in the list, hasNext() becomes false and available() returns zero as there are no more elements to retrieve.

Parameters n (cardinal) - the number of elements to skip

compliance: mandatory – This method must be implemented.

## **Osid Node**

#### class dlkit.osid.objects.OsidNode

Bases: dlkit.osid.markers.Identifiable, dlkit.osid.markers.Containable

A node interface for hierarchical objects.

The Id of the node is the Id of the object represented at this node.

### is\_root()

Tests if this node is a root in the hierarchy (has no parents).

A node may have no more parents available in this node structure but is not a root in the hierarchy. If both is\_root() and has\_parents() is false, the parents of this node may be accessed thorugh another node structure retrieval.

**Returns** true if this node is a root in the hierarchy, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## has\_parents()

Tests if any parents are available in this node structure.

There may be no more parents in this node structure however there may be parents that exist in the hierarchy.

**Returns** true if this node has parents, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### parent\_ids

Gets the parents of this node.

**Returns** the parents of this node

Return type osid.id.IdList

compliance: mandatory – This method must be implemented.

## is\_leaf()

Tests if this node is a leaf in the hierarchy (has no children).

A node may have no more children available in this node structure but is not a leaf in the hierarchy. If both  $is\_leaf()$  and  $has\_children()$  is false, the children of this node may be accessed thorugh another node structure retrieval.

**Returns** true if this node is a leaf in the hierarchy, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## has\_children()

Tests if any children are available in this node structure.

There may be no more children available in this node structure but this node may have children in the hierarchy.

Returns true if this node has children, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## child\_ids

Gets the children of this node.

Returns the children of this node

Return type osid.id.IdList

compliance: mandatory – This method must be implemented.

# Markers

## **Osid Primitive**

## class dlkit.osid.markers.OsidPrimitive

A marker interface for an interface that behaves like a language primitive.

Primitive types, such as numbers and strings, do not encapsulate behaviors supplied by an OSID Provider. More complex primitives are expressed through interface definitions but are treated in a similar fashion as a language primitive. OSID Primitives supplied by an OSID Consumer must be consumable by any OSID Provider.

## Identifiable

class dlkit.osid.markers.Identifiable

A marker interface for objects uniquely identified with an OSID Id.

## ident

Gets the Id associated with this instance of this OSID object.

Persisting any reference to this object is done by persisting the Id returned from this method. The Id returned may be different than the Id used to query this object. In this case, the new Id should be preferred over the old one for future queries.

Returns the  ${\tt Id}$ 

Return type osid.id.Id

*compliance: mandatory* – *This method must be implemented. implementation notes*: The Id is intended to be constant and persistent. A consumer may at any time persist the Id for retrieval at any future time. Ideally, the Id should consistently resolve into the designated object and not be reused. In cases where objects are deactivated after a certain lifetime the provider should endeavor not to obliterate the object or its Id but instead should update the properties of the object including the deactiavted status and the elimination of any unwanted pieces of data. As such, there is no means for updating an Id and providers should consider carefully the identification scheme to implement. Id assignments for objects are strictly in the realm of the provider and any errors should be fixed directly with the backend supporting system. Once an Id has been assigned in a production service it should be honored such that it may be necessary for the backend system to support Id aliasing to redirect the lookup to the current Id. Use of an Id OSID may be helpful to accomplish this task in a modular manner.

### is\_current()

Tests to see if the last method invoked retrieved up-to-date data.

Simple retrieval methods do not specify errors as, generally, the data is retrieved once at the time this object is instantiated. Some implementations may provide real-time data though the application may not always care. An implementation providing a real-time service may fall back to a previous snapshot in case of error. This method returns false if the data last retrieved was stale.

Returns true if the last data retrieval was up to date, false otherwise

Return type boolean

*compliance: mandatory – This method must be implemented. implementation notes*: Providers should return false unless all getters are implemented using real-time queries, or some trigger process keeps the data in this object current. Providers should populate basic data elements at the time this object is instantiated, or set an error, to ensure some data availability.

## Extensible

```
class dlkit.osid.markers.Extensible
```

A marker interface for objects that contain OsidRecords.

#### record\_types

Gets the record types available in this object.

A record Type explicitly indicates the specification of an interface to the record. A record may or may not inherit other record interfaces through interface inheritance in which case support of a record type may not be explicit in the returned list. Interoperability with the typed interface to this object should be performed through hasRecordType().

**Returns** the record types available

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

```
has_record_type (record_type)
```

Tests if this object supports the given record Type.

The given record type may be supported by the object through interface/type inheritence. This method should be checked before retrieving the record interface.

Parameters record\_type (osid.type.Type) - a type

**Returns** true if a record of the given record Type is available, false otherwise

Return type boolean

compliance: mandatory - This method must be implemented.

### **Browsable**

#### class dlkit.osid.markers.Browsable

A marker interface for objects that offer property inspection.

#### properties

Gets a list of properties.

Properties provide a means for applications to display a representation of the contents of a record without understanding its Type specification. Applications needing to examine a specific property should use the extension interface defined by its Type.

**Returns** a list of properties

Return type osid.PropertyList

Raise OperationFailed - unable to complete request

Raise PermissionDenied - an authorization failure occurred

compliance: mandatory – This method must be implemented.

## get\_properties\_by\_record\_type(record\_type)

Gets a list of properties corresponding to the specified record type.

Properties provide a means for applications to display a representation of the contents of a record without understanding its record interface specification. Applications needing to examine a specific property should use the methods defined by the record Type. The resulting set includes properties specified by parents of the record type in the case a record's interface extends another.

```
Parameters record_type (osid.type.Type) - the record type corresponding to the properties set to retrieve
```

Returns a list of properties

Return type osid.PropertyList

**Raise** NullArgument - record\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - an authorization failure occurred

**Raise** Unsupported - has\_record\_type (record\_type) is false

compliance: mandatory – This method must be implemented.

## Suppliable

```
class dlkit.osid.markers.Suppliable
```

A marker interface for OSID Provider-owned objects used to supply input from an OSID Consumer.

## **Temporal**

```
class dlkit.osid.markers.Temporal
```

Temporal is used to indicate the object endures for a period of time.

### is\_effective()

Tests if the current date is within the start end end dates inclusive.

Returns true if this is effective, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### start\_date

Gets the start date.

**Returns** the start date

Return type osid.calendaring.DateTime

compliance: mandatory – This method must be implemented.

## end\_date

Gets the end date.

Returns the end date

Return type osid.calendaring.DateTime

compliance: mandatory – This method must be implemented.

## Subjugateable

#### class dlkit.osid.markers.Subjugateable

A Subjugateable is an OsidObject dependent upon another OsidObject.

A Subjugateable is created in the context of the administering OsidObject that may not be reassigned.

A Subjugateable always has a fixed Id of it administering OsidObject.

## Aggregateable

#### class dlkit.osid.markers.Aggregateable

Aggregateable is used for an OsidObject to indicate that some or all of the definition is based on an included set of other OsidObjects which are directly accessible and do not exist outside the context of the parent object.

Aggregateables allow for an OsidObject to stand alone without knowledge of the originating service.

An Asset is an example of an aggregate by including the AssetContents. An Asset also contains a provider however in this case the provider is categorized as a simple data attribute of the Asset that can be changed by updating the Asset using an AssetForm. The AssetContent differs in there exists a explicit mapping to the Asset managed through an OsidSession but accessible directly within the Asset to enable its consumption outside the Repository OSID.

This marker has little practicality other than to identify a service pattern that is neither a data attribute nor a separately accessible relationship or mapping.

## Containable

class dlkit.osid.markers.Containable

A Containable is a kind of aggregate where an OsidObject is defined as a recursive composition of itself directly accessible without knowledge of the originating service.

### is\_sequestered()

Tests if this Containable is sequestered in that it should not appear outside of its aggregated composition.

**Returns** true if this containable is sequestered, false if this containable may appear outside its aggregate

Return type boolean

compliance: mandatory – This method must be implemented.

## Sourceable

class dlkit.osid.markers.Sourceable

Sourceble is used for OsidObjects where information about a provider is appropriate.

Examples of Sourceables are catalogs, compositions, and services.

provider\_id

Gets the Id of the provider.

**Returns** the provider Id

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

## provider

Gets the Resource representing the provider.

**Returns** the provider

Return type osid.resource.Resource

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

## branding\_ids

Gets the branding asset Ids.

Returns a list of asset Ids

Return type osid.id.IdList

compliance: mandatory – This method must be implemented.

### branding

Gets a branding, such as an image or logo, expressed using the Asset interface.

Returns a list of assets

Return type osid.repository.AssetList

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

#### license\_

Gets the terms of usage.

An empty license means the terms are unknown.

**Returns** the license

Return type osid.locale.DisplayText

compliance: mandatory – This method must be implemented.

## Federateable

```
class dlkit.osid.markers.Federateable
```

Federateable is used to indicate an OsidObject can be federated using the OSID Hierarchy pattern.

An OSID federation of OsidObjects is where it is inferred from the hiererarchy that any OsidObject "includes" its children.

## Operable

### class dlkit.osid.markers.Operable

Operable is used to indicate an OsidObject performs operations.

The active status indicates if the Operable is on or off. The active status is determined from the operational status and the enabling rules.

The operational status indicates the Operable is functioning. This status is not set administratively but instead refelects suitable conditions for operation.

Operables may be administratively turned on of off through the enabled and disabled administrative overrides. If there are no related OsidEnabler rules, then is\_enabled() should be set to true and is\_disabled() set to false for the Operable to be on and is\_enabled() set to false and is\_disabled() set to true for the Operable to be off. is\_enabled() and is\_disabled() cannot both be true.

If there are related <code>OsidEnabler rules</code>, the active status of at least one <code>OsidEnabler results</code> in a true value for <code>isOperational()</code>. This active status can be overridden by setting <code>is\_disabled()</code> to true. If there are no active <code>OsidEnabler rules</code>, <code>is\_operational()</code> is false resulting in an off <code>Operable</code> unless <code>is\_enabled()</code> is true.

For the active status to be completely determined by the OsidEnablers, both is\_enabled() and is\_disabled() should be false where the is\_active() status is completely driven from isOperational().

## $\texttt{is\_active()}$

Tests if this operable is active.

is\_active() is true if is\_operational() is true and is\_disabled() is false, or is\_enabled() is true.

Returns true if this operable is on, false if it is off

Return type boolean

compliance: mandatory – This method must be implemented.

## is\_enabled()

Tests if this operable is administravely enabled.

Administratively enabling overrides any applied OsidEnabler. If this method returns true then is\_disabled() must return false.

**Returns** true if this operable is enabled, false if the active status is determined by other rules

Return type boolean

compliance: mandatory – This method must be implemented.

## $\verb"is_disabled()$

Tests if this operable is administravely disabled.

Administratively disabling overrides any applied OsidEnabler. If this method returns true then is\_enabled() must return false.

**Returns** true if this operable is disabled, false if the active status is determined by other rules

Return type boolean

compliance: mandatory – This method must be implemented.

### is\_operational()

Tests if this Operable is operational.

This Operable is operational if any of the applied OsidEnablers are true.

**Returns** true if this operable is operational, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# Queries

## **Osid Query**

```
class dlkit.osid.queries.OsidQuery
```

Bases: dlkit.osid.markers.Suppliable

The OsidQuery is used to assemble search queries.

An OsidQuery is available from an OsidQuerySession and defines methods to match objects. Once the desired parameters are set, the OsidQuery is given to the designated search method. The same OsidQuery returned from the session must be used in the search as the provider may utilize implementation-specific data within the object.

If multiple data elements are set in this interface, the results matching all the given data (eg: AND) are returned.

Any match method inside an OsidQuery may be invoked multiple times. In the case of a match method, each invocation adds an element to an OR expression. Any of these terms may also be negated through the match flag.

OsidQuery { OsidQuery.matchDisplayName AND (OsidQuery.matchDescription OR OsidQuery.matchDescription)}

OsidObjects allow for the definition of an additonal records and the OsidQuery parallels this mechanism. An interface type of an OsidObject record must also define the corresponding OsidQuery record which is available through query interfaces. Multiple requests of these typed interfaces may return the same underlying object and thus it is only useful to request once.

An OsidQuery may be used to query for set or unset values using the "match any" methods. A field that has not bee explicitly assigned may default to a value. If multiple language translations exist and the query session is placed in a non-default locale, fields that have not been explicitly assigned in the non-default locale are considered unset even if the values from the default locale appear in the objects.

## string\_match\_types

Gets the string matching types supported.

A string match type specifies the syntax of the string query, such as matching a word or including a wildcard or regular expression.

**Returns** a list containing the supported string match types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

supports\_string\_match\_type (string\_match\_type)

Tests if the given string matching type is supported.

Parameters string\_match\_type (osid.type.Type) - a Type indicating a string match type

**Returns** true if the given Type is supported, false otherwise

Return type boolean

**Raise** NullArgument - string\_match\_type is null

compliance: mandatory – This method must be implemented.

match\_keyword (keyword, string\_match\_type, match)

Adds a keyword to match.

Multiple keywords can be added to perform a boolean OR among them. A keyword may be applied to any of the elements defined in this object such as the display name, description or any method defined in an interface implemented by this object.

### **Parameters**

- keyword (string) keyword to match
- string\_match\_type (osid.type.Type) the string match type
- match (boolean) true for a positive match, false for a negative match

Raise InvalidArgument - keyword is not of string\_match\_type

**Raise** NullArgument - keyword or string\_match\_type is null

Raise Unsupported - supports\_string\_match\_type(string\_match\_type) is
false

compliance: mandatory – This method must be implemented.

### keyword\_terms

match\_any (match)
 Matches any object.

Parameters match (boolean) - true to match any object, false to match no objects

compliance: mandatory – This method must be implemented.

any\_terms

### **Osid Identifiable Query**

```
class dlkit.osid.queries.OsidIdentifiableQuery
```

Bases: dlkit.osid.queries.OsidQuery

The OsidIdentiableQuery is used to assemble search queries for Identifiable objects.

An OsidIdentifiableQuery is available from an OsidQuerySession and defines methods to match objects. Once the desired parameters are set, the OsidIdentifiableQuery is given to the designated search method. The same OsidIdentifiableQuery returned from the session must be used in the search as the provider may utilize implementation-specific data within the object.

If multiple data elements are set in this interface, the results matching all the given data (eg: AND) are returned.

match\_id(id\_, match)

Adds an Id to match.

Multiple Ids can be added to perform a boolean OR among them.

#### **Parameters**

- id (osid.id.Id) Id to match
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - id is null

compliance: mandatory – This method must be implemented.

id\_terms

## **Osid Extensible Query**

### class dlkit.osid.queries.OsidExtensibleQuery

Bases: dlkit.osid.queries.OsidQuery, dlkit.osid.markers.Extensible

The OsidExtensibleQuery is used to assemble search queries for Extensible objects.

An OsidExtensibleQuery is available from an OsidQuerySession and defines methods to match objects. Once the desired parameters are set, the OsidExtensibleQuery is given to the designated search method. The same OsidExtensibleQuery returned from the session must be used in the search as the provider may utilize implementation-specific data within the object.

If multiple data elements are set in this interface, the results matching all the given data (eg: AND) are returned.

### match\_record\_type (record\_type, match)

Sets a Type for querying objects having records implementing a given record type.

#### **Parameters**

- record\_type (osid.type.Type) a record type
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - record\_type is null

compliance: mandatory – This method must be implemented.

### match\_any\_record (match)

Matches an object that has any record.

Parameters match (boolean) - true to match any record, false to match objects with no records

compliance: mandatory – This method must be implemented.

record\_terms

### **Osid Browsable Query**

```
class dlkit.osid.queries.OsidBrowsableQuery
```

Bases: dlkit.osid.queries.OsidQuery

The OsidBrowsableQuery is used to assemble search queries for Browsable objects.

An OsidBrowsableQuery is available from an OsidQuerySession and defines methods to match objects. Once the desired parameters are set, the OsidBrowsableQuery is given to the designated search method. The same OsidBrowsableQuery returned from the session must be used in the search as the provider may utilize implementation-specific data within the object.

If multiple data elements are set in this interface, the results matching all the given data (eg: AND) are returned.

### **Osid Temporal Query**

#### class dlkit.osid.queries.OsidTemporalQuery

Bases: dlkit.osid.queries.OsidQuery

This is the query interface for searching temporal objects.

Each method specifies an AND term while multiple invocations of the same method produce a nested OR.

### match\_effective (match)

Match effective objects where the current date falls within the start and end dates inclusive.

**Parameters match** (boolean) - true to match any effective, false to match ineffective

compliance: mandatory – This method must be implemented.

#### effective\_terms

### match\_start\_date(start, end, match)

Matches temporals whose start date falls in between the given dates inclusive.

### **Parameters**

- **start** (osid.calendaring.DateTime) start of date range
- end (osid.calendaring.DateTime) end of date range
- match (boolean) true if a positive match, false for a negative match

**Raise** InvalidArgument – start is less than end

Raise NullArgument - start or end is null

compliance: mandatory – This method must be implemented.

## match\_any\_start\_date(match)

Matches temporals with any start date set.

Parameters match (boolean) - true to match any start date, false to match no start date

compliance: mandatory – This method must be implemented.

### start\_date\_terms

#### match\_end\_date (start, end, match)

Matches temporals whose effective end date falls in between the given dates inclusive.

### Parameters

- **start** (osid.calendaring.DateTime) start of date range
- end (osid.calendaring.DateTime) end of date range
- match (boolean) true if a positive match, false for negative match

Raise InvalidArgument - start is less than end

**Raise** NullArgument - start or end is null

compliance: mandatory – This method must be implemented.

### match\_any\_end\_date(match)

Matches temporals with any end date set.

Parameters match (boolean) - true to match any end date, false to match no start date

compliance: mandatory – This method must be implemented.

### end\_date\_terms

match\_date (from\_, to, match)

Matches temporals where the given date range falls entirely between the start and end dates inclusive.

### **Parameters**

- **from** (osid.calendaring.DateTime) start date
- to (osid.calendaring.DateTime) end date
- match (boolean) true if a positive match, false for a negative match

Raise InvalidArgument - from is less than to

**Raise** NullArgument - from or to is null

compliance: mandatory – This method must be implemented.

### date\_terms

## **Osid Subjugateable Query**

class dlkit.osid.queries.OsidSubjugateableQuery Bases: dlkit.osid.queries.OsidQuery

The OsidSubjugateableQuery is used to assemble search queries for dependent objects.

## **Osid Aggregateable Query**

```
class dlkit.osid.queries.OsidAggregateableQuery
Bases: dlkit.osid.queries.OsidQuery
```

The OsidAggregateableQuery is used to assemble search queries for assemblages.

## **Osid Containable Query**

```
class dlkit.osid.queries.OsidContainableQuery
```

Bases: dlkit.osid.queries.OsidQuery

This is the query interface for searching containers.

Each method specifies an AND term while multiple invocations of the same method produce a nested OR.

## match\_sequestered(match)

Match containables that are sequestered.

**Parameters match** (boolean) – true to match any sequestered containables, false to match non-sequestered containables

compliance: mandatory – This method must be implemented.

### sequestered\_terms

# **Osid Sourceable Query**

```
class dlkit.osid.queries.OsidSourceableQuery
```

Bases: dlkit.osid.queries.OsidQuery

The OsidSourceableQuery is used to assemble search queries for sourceables.

# match\_provider\_id (resource\_id, match)

Match the Id of the provider resource.

# Parameters

- **resource\_id** (osid.id.Id) Id to match
- match (boolean) true if for a positive match, false for a negative match

**Raise** NullArgument - resource\_id is null

compliance: mandatory – This method must be implemented.

## provider\_id\_terms

### supports\_provider\_query()

Tests if a ResourceQuery for the provider is available.

**Returns** true if a resource query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## get\_provider\_query(match)

Gets the query for the provider.

Each retrieval performs a boolean OR.

Parameters match (boolean) - true if for a positive match, false for a negative match

**Returns** the provider query

Return type osid.resource.ResourceQuery

Raise Unimplemented - supports\_provider\_query() is false

compliance: optional – This method must be implemented if ''supports\_provider\_query()'' is ''true''.

### match\_any\_provider(match)

Match sourceables with a provider value.

**Parameters match** (boolean) – true to match sourceables with any provider, false to match sourceables with no providers

compliance: mandatory – This method must be implemented.

# provider\_terms

match\_branding\_id(asset\_id, match)

Match the  ${\tt Id}$  of an asset used for branding.

**Parameters** 

- asset\_id (osid.id.Id) Id to match
- match (boolean) true if for a positive match, false for a negative match

Raise NullArgument - asset\_id is null

### branding\_id\_terms

## supports\_branding\_query()

Tests if an AssetQuery for the branding is available.

Returns true if a asset query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# get\_branding\_query (match)

Gets the query for an asset.

Each retrieval performs a boolean OR.

Parameters match (boolean) - true if for a positive match, false for a negative match

**Returns** the asset query

Return type osid.repository.AssetQuery

Raise Unimplemented - supports\_branding\_query() is false

compliance: optional – This method must be implemented if "supports\_branding\_query()" is "true".

## match\_any\_branding(match)

Match sourceables with any branding.

Parameters match (boolean) - true to match any asset, false to match no assets

compliance: mandatory – This method must be implemented.

## branding\_terms

match\_license (license\_, string\_match\_type, match)

Adds a license to match.

Multiple license matches can be added to perform a boolean OR among them.

# Parameters

- license (string) a string to match
- string\_match\_type (osid.type.Type) the string match type
- match (boolean) true for a positive match, false for a negative match

**Raise** InvalidArgument - license is not of string\_match\_type

**Raise** NullArgument - license or string\_match\_type is null

Raise Unsupported - supports\_string\_match\_type(string\_match\_type) is
 false

compliance: mandatory – This method must be implemented.

# match\_any\_license(match)

Matches any object with a license.

**Parameters match** (boolean) - true to match any license, false to match objects with no license

compliance: mandatory – This method must be implemented.

### license\_terms

# **Osid Federateable Query**

```
class dlkit.osid.queries.OsidFederateableQuery
    Bases: dlkit.osid.queries.OsidQuery
```

The OsidFederateableQuery is used to assemble search queries for federated objects.

# **Osid Operable Query**

```
class dlkit.osid.queries.OsidOperableQuery
```

Bases: dlkit.osid.queries.OsidQuery

This is the query interface for searching operables.

Each method specifies an AND term while multiple invocations of the same method produce a nested OR.

### match\_active (match)

Matches active.

**Parameters match** (boolean) - true to match active, false to match inactive

compliance: mandatory - This method must be implemented.

## active\_terms

```
match_enabled(match)
```

Matches administratively enabled.

**Parameters match** (boolean) - true to match administratively enabled, false otherwise

compliance: mandatory – This method must be implemented.

### enabled\_terms

match\_disabled(match)

Matches administratively disabled.

**Parameters match** (boolean) - true to match administratively disabled, false otherwise

compliance: mandatory – This method must be implemented.

## disabled\_terms

```
match_operational(match)
```

Matches operational operables.

```
Parameters match (boolean) - true to match operational, false to match not operational
```

compliance: mandatory – This method must be implemented.

# operational\_terms

# **Osid Object Query**

## class dlkit.osid.queries.OsidObjectQuery

**Bases:** dlkit.osid.queries.OsidIdentifiableQuery, dlkit.osid.queries. OsidExtensibleQuery, dlkit.osid.queries.OsidBrowsableQuery

The OsidObjectQuery is used to assemble search queries.

An OsidObjectQuery is available from an OsidSession and defines methods to query for an OsidObject that includes setting a display name and a description. Once the desired parameters are set,

the OsidQuery is given to the designated search method. The same OsidQuery returned from the session must be used in the search as the provider may utilize implementation-specific data within the object.

If multiple data elements are set in this interface, the results matching all the given data (eg: AND) are returned.

Any match method inside an OsidObjectQuery may be invoked multiple times. In the case of a match method, each invocation adds an element to an OR expression. Any of these terms may also be negated through the match flag.

OsidObjectQuery { OsidQuery.matchDisplayName AND (OsidQuery.matchDescription OR OsidObjectQuery.matchDescription)}

OsidObjects allow for the definition of an additonal records and the OsidQuery parallels this mechanism. An interface type of an OsidObject record must also define the corresponding OsidQuery record which is available through query interfaces. Multiple requests of these typed interfaces may return the same underlying object and thus it is only useful to request once.

String searches are described using a string search Type that indicates the type of regular expression or wildcarding encoding. Compatibility with a strings search Type can be tested within this interface.

As with all aspects of OSIDs, nulls cannot be used. Separate tests are available for querying for unset values except for required fields.

An example to find all objects whose name starts with "Fred" or whose name starts with "Barney", but the word "dinosaur" does not appear in the description and not the color is not purple. ColorQuery is a record of the object that defines a color.

ObjectObjectQuery query; query = session.getObjectQuery(); query.matchDisplayName("Fred\*", wildcardStringMatchType, true); query.matchDisplayName("Barney\*", wildcardStringMatchType, true); query.matchDescriptionMatch("dinosaur", wordStringMatchType, false);

ColorQuery recordQuery; recordQuery = query.getObjectRecord(colorRecordType); record-Query.matchColor("purple", false); ObjectList list = session.getObjectsByQuery(query);

## **match\_display\_name** (*display\_name*, *string\_match\_type*, *match*) Adds a display name to match.

Multiple display name matches can be added to perform a boolean OR among them.

# **Parameters**

- display\_name (string) display name to match
- string\_match\_type (osid.type.Type) the string match type
- match (boolean) true for a positive match, false for a negative match

**Raise** InvalidArgument - display\_name is not of string\_match\_type

**Raise** NullArgument - display\_name or string\_match\_type is null

Raise Unsupported - supports\_string\_match\_type(string\_match\_type) is
 false

compliance: mandatory – This method must be implemented.

# match\_any\_display\_name (match)

Matches any object with a display name.

**Parameters match** (boolean) - true to match any display name, false to match objects with no display name

compliance: mandatory – This method must be implemented.

display\_name\_terms

```
match_description (description, string_match_type, match)
Adds a description name to match.
```

Multiple description matches can be added to perform a boolean OR among them.

## Parameters

- **description** (string) description to match
- string\_match\_type (osid.type.Type) the string match type
- match (boolean) true for a positive match, false for a negative match

**Raise** InvalidArgument - description is not of string\_match\_type

**Raise** NullArgument - description or string\_match\_type is null

Raise Unsupported - supports\_string\_match\_type(string\_match\_type) is
false

compliance: mandatory – This method must be implemented.

## match\_any\_description(match)

Matches a description that has any value.

**Parameters match** (boolean) – true to match any description, false to match descriptions with no values

compliance: mandatory – This method must be implemented.

# description\_terms

match\_genus\_type (genus\_type, match)

Sets a Type for querying objects of a given genus.

A genus type matches if the specified type is the same genus as the object genus type.

# **Parameters**

- genus\_type (osid.type.Type) the object genus type
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - genus\_type is null

compliance: mandatory – This method must be implemented.

### match\_any\_genus\_type (match)

Matches an object that has any genus type.

**Parameters match** (boolean) – true to match any genus type, false to match objects with no genus type

*compliance: mandatory – This method must be implemented.* 

## genus\_type\_terms

# match\_parent\_genus\_type (genus\_type, match)

Sets a Type for querying objects of a given genus.

A genus type matches if the specified type is the same genus as the object or if the specified type is an ancestor of the object genus in a type hierarchy.

# **Parameters**

- genus\_type (osid.type.Type) the object genus type
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - genus\_type is null

compliance: mandatory – This method must be implemented.

## parent\_genus\_type\_terms

match\_subject\_id(subject\_id, match)

Matches an object with a relationship to the given subject.

### Parameters

- subject\_id (osid.id.Id) a subject Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - subject\_id is null

compliance: mandatory – This method must be implemented.

# subject\_id\_terms

### supports\_subject\_query()

Tests if a SubjectQuery is available.

**Returns** true if a subject query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## subject\_query

Gets the query for a subject.

Multiple retrievals produce a nested OR term.

Returns the subject query

Return type osid.ontology.SubjectQuery

**Raise** Unimplemented - supports\_subject\_query() is false

compliance: optional – This method must be implemented if "supports\_subject\_query()" is "true".

# match\_any\_subject(match)

Matches an object that has any relationship to a Subject.

**Parameters match** (boolean) - true to match any subject, false to match objects with no subjects

compliance: mandatory – This method must be implemented.

### subject\_terms

### supports\_subject\_relevancy\_query()

Tests if a RelevancyQuery is available to provide queries about the relationships to Subjects.

**Returns** true if a relevancy entry query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## subject\_relevancy\_query

Gets the query for a subject relevancy.

Multiple retrievals produce a nested OR term.

Returns the relevancy query

Return type osid.ontology.RelevancyQuery

**Raise** Unimplemented - supports\_subject\_relevancy\_query() is false

compliance: optional – This method must be implemented if ''supports\_subject\_relevancy\_query()'' is ''true''.

### subject\_relevancy\_terms

match\_state\_id(state\_id, match)

Matches an object mapped to the given state.

Parameters

- state\_id (osid.id.Id) a state Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - state\_id is null

compliance: mandatory – This method must be implemented.

## state\_id\_terms

### supports\_state\_query()

Tests if a StateQuery is available to provide queries of processed objects.

**Returns** true if a state query is available, false otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

## state\_query

Gets the query for a state.

Multiple retrievals produce a nested OR term.

**Returns** the journal entry query

Return type osid.process.StateQuery

Raise Unimplemented - supports\_state\_query() is false

compliance: optional – This method must be implemented if "supports\_state\_query()" is "true".

### match\_any\_state(match)

Matches an object that has any mapping to a State in the given Process.

**Parameters match** (boolean) - true to match any state, false to match objects with no states

compliance: mandatory – This method must be implemented.

### state\_terms

match\_comment\_id (comment\_id, match)
Matches an object that has the given comment.

**Parameters** 

- comment\_id (osid.id.Id) a comment Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - comment\_id is null

comment\_id\_terms

### supports\_comment\_query()

Tests if a CommentQuery is available.

**Returns** true if a comment query is available, false otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

# comment\_query

Gets the query for a comment.

Multiple retrievals produce a nested OR term.

**Returns** the comment query

Return type osid.commenting.CommentQuery

**Raise** Unimplemented - supports\_comment\_query() is false

compliance: optional – This method must be implemented if "supports\_comment\_query()" is "true".

### match\_any\_comment (match)

Matches an object that has any Comment in the given Book.

**Parameters match** (boolean) - true to match any comment, false to match objects with no comments

compliance: mandatory – This method must be implemented.

## comment\_terms

match\_journal\_entry\_id (journal\_entry\_id, match)
Matches an object that has the given journal entry.

### **Parameters**

- journal\_entry\_id (osid.id.Id) a journal entry Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - journal\_entry\_id is null

compliance: mandatory – This method must be implemented.

### journal\_entry\_id\_terms

# supports\_journal\_entry\_query()

Tests if a JournalEntry is available to provide queries of journaled OsidObjects.

**Returns** true if a journal entry query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# journal\_entry\_query

Gets the query for a journal entry.

Multiple retrievals produce a nested OR term.

Returns the journal entry query

Return type osid.journaling.JournalEntryQuery

Raise Unimplemented - supports\_journal\_entry\_query() is false

compliance: optional – This method must be implemented if "supports\_journal\_entry\_query()" is "true".

### match\_any\_journal\_entry(match)

Matches an object that has any JournalEntry in the given Journal.

**Parameters match** (boolean) - true to match any journal entry, false to match objects with no journal entries

compliance: mandatory – This method must be implemented.

## journal\_entry\_terms

### supports\_statistic\_query()

Tests if a StatisticQuery is available to provide statistical queries.

**Returns** true if a statistic query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### statistic\_query

Gets the query for a statistic.

Multiple retrievals produce a nested OR term.

Returns the statistic query

Return type osid.metering.StatisticQuery

**Raise** Unimplemented - supports\_statistic\_query() is false

compliance: optional – This method must be implemented if ''supports\_statistic\_query()'' is ''true''.

### match\_any\_statistic(match)

Matches an object that has any Statistic.

**Parameters match** (boolean) – true to match any statistic, false to match objects with no statistics

compliance: mandatory – This method must be implemented.

# statistic\_terms

match\_credit\_id (credit\_id, match)

Matches an object that has the given credit.

### **Parameters**

- credit\_id (osid.id.Id) a credit Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - credit\_id is null

compliance: mandatory – This method must be implemented.

# credit\_id\_terms

### supports\_credit\_query()

Tests if a CreditQuery is available to provide queries of related acknowledgements.

Returns true if a credit query is available, false otherwise

Return type boolean

## credit\_query

Gets the query for an ackowledgement credit.

Multiple retrievals produce a nested OR term.

**Returns** the credit query

Return type osid.acknowledgement.CreditQuery

**Raise** Unimplemented - supports\_credit\_query() is false

compliance: optional – This method must be implemented if ''supports\_credit\_query()'' is ''true''.

# match\_any\_credit (match)

Matches an object that has any Credit.

*compliance: mandatory – This method must be implemented.* 

### credit\_terms

match\_relationship\_id (relationship\_id, match)
Matches an object that has the given relationship.

### **Parameters**

- relationship\_id (osid.id.Id) a relationship Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - relationship\_id is null

compliance: mandatory – This method must be implemented.

### relationship\_id\_terms

### supports\_relationship\_query()

Tests if a RelationshipQuery is available.

**Returns** true if a relationship query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### relationship\_query

Gets the query for relationship.

Multiple retrievals produce a nested OR term.

Returns the relationship query

Return type osid.relationship.RelationshipQuery

Raise Unimplemented - supports\_relationship\_query() is false

compliance: optional – This method must be implemented if "supports\_relationship\_query()" is "true".

### match\_any\_relationship(match)

Matches an object that has any Relationship.

**Parameters match** (boolean) - true to match any relationship, false to match objects with no relationships

compliance: mandatory – This method must be implemented.

### relationship\_terms

match\_relationship\_peer\_id(peer\_id, match)

Matches an object that has a relationship to the given peer Id.

**Parameters** 

- peer\_id (osid.id.Id) a relationship peer Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - peer\_id is null

compliance: mandatory – This method must be implemented.

# relationship\_peer\_id\_terms

## **Osid Relationship Query**

### class dlkit.osid.queries.OsidRelationshipQuery

dlkit.osid.queries.OsidObjectQuery, Bases: OsidTemporalQuery

dlkit.osid.queries.

This is the query interface for searching relationships.

Each method specifies an AND term while multiple invocations of the same method produce a nested OR.

### match end reason id(state id, match)

Match the Td of the end reason state.

## **Parameters**

- state\_id (osid.id.Id) Id to match
- match (boolean) true if for a positive match, false for a negative match

**Raise** NullArgument - rule\_id is null

compliance: mandatory – This method must be implemented.

### end\_reason\_id\_terms

### supports\_end\_reason\_query()

Tests if a StateQuery for the end reason is available.

Returns true if a end reason query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## get\_end\_reason\_query(match)

Gets the query for the end reason state.

Each retrieval performs a boolean OR.

**Parameters match** (boolean) – true if for a positive match, false for a negative match

**Returns** the state query

Return type osid.process.StateQuery

Raise Unimplemented - supports\_end\_reason\_query() is false

compliance: optional – This method must be implemented if "supports\_end\_reason\_query()" is "true".

# match\_any\_end\_reason(match)

Match any end reason state.

Parameters match (boolean) - true to match any state, false to match no state

compliance: mandatory – This method must be implemented.

end\_reason\_terms

# **Osid Catalog Query**

```
class dlkit.osid.queries.OsidCatalogQuery
```

```
Bases:
              dlkit.osid.queries.OsidObjectQuery,
                                                       dlkit.osid.queries.
OsidSourceableQuery, dlkit.osid.queries.OsidFederateableQuery
```

The OsidCatalogQuery is used to assemble search queries for catalogs.

# **Osid Rule Query**

class dlkit.osid.queries.OsidRuleQuery

```
Bases:
              dlkit.osid.queries.OsidObjectQuery, dlkit.osid.queries.
OsidOperableQuery
```

This is the query interface for searching rules.

Each method specifies an AND term while multiple invocations of the same method produce a nested OR.

match\_rule\_id(rule\_id, match) Match the Id of the rule.

**Parameters** 

- rule\_id (osid.id.Id) Id to match
- match (boolean) true if for a positive match, false for a negative match

**Raise** NullArgument - rule\_id is null

compliance: mandatory – This method must be implemented.

## rule\_id\_terms

```
supports_rule_query()
```

Tests if a RuleQuery for the rule is available.

**Returns** true if a rule query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### get\_rule\_query (match)

Gets the query for the rule.

Each retrieval performs a boolean OR.

Parameters match (boolean) - true if for a positive match, false for a negative match

**Returns** the rule query

**Return type** osid.rules.RuleQuery

Raise Unimplemented - supports\_rule\_query() is false

compliance: optional – This method must be implemented if "supports\_rule\_query()" is "true".

```
match_any_rule (match)
```

Match any associated rule.

Parameters match (boolean) - true to match any rule, false to match no rules

compliance: mandatory – This method must be implemented.

### rule\_terms

# **Osid Enabler Query**

## class dlkit.osid.queries.OsidEnablerQuery

Bases: dlkit.osid.queries.OsidRuleQuery, dlkit.osid.queries.OsidTemporalQuery

This is the query interface for searching enablers.

Each method specifies an AND term while multiple invocations of the same method produce a nested OR.

### match\_schedule\_id (schedule\_id, match)

Match the Id of an associated schedule.

### **Parameters**

- schedule\_id (osid.id.Id) Id to match
- match (boolean) true if for a positive match, false for a negative match

**Raise** NullArgument - schedule\_id is null

compliance: mandatory – This method must be implemented.

## schedule\_id\_terms

### supports\_schedule\_query()

Tests if a ScheduleQuery for the rule is available.

**Returns** true if a schedule query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## get\_schedule\_query(match)

Gets the query for the schedule.

Each retrieval performs a boolean OR.

Parameters match (boolean) - true if for a positive match, false for a negative match

**Returns** the schedule query

Return type osid.calendaring.ScheduleQuery

Raise Unimplemented - supports\_schedule\_query() is false

compliance: optional – This method must be implemented if "supports\_schedule\_query()" is "true".

# match\_any\_schedule(match)

Match any associated schedule.

**Parameters match** (boolean) - true to match any schedule, false to match no schedules

compliance: mandatory – This method must be implemented.

## schedule\_terms

match\_event\_id (event\_id, match)
Match the Id of an associated event.

**Parameters** 

- event\_id (osid.id.Id) Id to match
- match (boolean) true if for a positive match, false for a negative match

Raise NullArgument - event\_id is null

compliance: mandatory – This method must be implemented.

## event\_id\_terms

### supports\_event\_query()

Tests if a EventQuery for the rule is available.

**Returns** true if an event query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## get\_event\_query (match)

Gets the query for the event.

Each retrieval performs a boolean OR.

Parameters match (boolean) - true if for a positive match, false for a negative match

Returns the event query

Return type osid.calendaring.EventQuery

Raise Unimplemented - supports\_event\_query() is false

compliance: optional – This method must be implemented if "supports\_event\_query()" is "true".

# match\_any\_event (match)

Match any associated event.

Parameters match (boolean) - true to match any event, false to match no events

compliance: mandatory – This method must be implemented.

# event\_terms

match\_cyclic\_event\_id (cyclic\_event\_id, match)
Sets the cyclic event Id for this query.

**Parameters** 

- cyclic\_event\_id (osid.id.Id) the cyclic event Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - cyclic\_event\_id is null

compliance: mandatory – This method must be implemented.

cyclic\_event\_id\_terms

```
supports_cyclic_event_query()
```

Tests if a CyclicEventQuery is available.

**Returns** true if a cyclic event query is available, false otherwise

Return type boolean

## cyclic\_event\_query

Gets the query for a cyclic event.

Multiple retrievals produce a nested OR term.

**Returns** the cyclic event query

**Return type** osid.calendaring.cycle.CyclicEventQuery

Raise Unimplemented - supports\_cyclic\_event\_query() is false

compliance: optional – This method must be implemented if ''supports\_cyclic\_event\_query()'' is ''true''.

# match\_any\_cyclic\_event(match)

Matches any enabler with a cyclic event.

**Parameters match** (boolean) – true to match any enablers with a cyclic event, false to match enablers with no cyclic events

compliance: mandatory – This method must be implemented.

### cyclic\_event\_terms

**match\_demographic\_id** (*resource\_id*, *match*) Match the Id of the demographic resource.

### **Parameters**

- resource\_id (osid.id.Id) Id to match
- match (boolean) true if for a positive match, false for a negative match

**Raise** NullArgument - resource\_id is null

compliance: mandatory – This method must be implemented.

### demographic\_id\_terms

### supports\_demographic\_query()

Tests if a ResourceQuery for the demographic is available.

**Returns** true if a resource query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### get\_demographic\_query(match)

Gets the query for the resource.

Each retrieval performs a boolean OR.

**Parameters match** (boolean) – true if for a positive match, false for a negative match

**Returns** the resource query

Return type osid.resource.ResourceQuery

Raise Unimplemented - supports\_resource\_query() is false

compliance: optional – This method must be implemented if "supports\_resource\_query()" is "true".

### match\_any\_demographic (match)

Match any associated resource.

**Parameters match** (boolean) – true to match any demographic, false to match no rules *compliance: mandatory* – *This method must be implemented.* 

# demographic\_terms

# **Osid Constrainer Query**

class dlkit.osid.queries.OsidConstrainerQuery

Bases: dlkit.osid.queries.OsidRuleQuery

This is the query interface for searching constrainers.

Each method specifies an AND term while multiple invocations of the same method produce a nested OR.

# **Osid Processor Query**

class dlkit.osid.queries.OsidProcessorQuery

Bases: dlkit.osid.queries.OsidRuleQuery

This is the query interface for searching processors.

Each method specifies an AND term while multiple invocations of the same method produce a nested OR.

# **Osid Governator Query**

class dlkit.osid.queries.OsidGovernatorQuery

```
Bases: dlkit.osid.queries.OsidObjectQuery, dlkit.osid.queries.
OsidOperableQuery, dlkit.osid.queries.OsidSourceableQuery
```

This is the query interface for searching governers.

Each method specifies an AND term while multiple invocations of the same method produce a nested OR.

# **Osid Compendium Query**

This is the query interface for searching reports.

Each method specifies an AND term while multiple invocations of the same method produce a nested OR.

## match\_start\_date(start, end, match)

Matches reports whose start date falls in between the given dates inclusive.

## Parameters

- **start** (osid.calendaring.DateTime) start of date range
- end (osid.calendaring.DateTime) end of date range
- match (boolean) true if a positive match, false for a negative match

Raise InvalidArgument - start is less than end

Raise NullArgument - start or end is null

compliance: mandatory – This method must be implemented.

match\_any\_start\_date(match)

Matches reports with any start date set.

Parameters match (boolean) - true to match any start date, false to match no start date

compliance: mandatory – This method must be implemented.

# start\_date\_terms

match\_end\_date (start, end, match)

Matches reports whose effective end date falls in between the given dates inclusive.

### Parameters

- **start** (osid.calendaring.DateTime) start of date range
- end (osid.calendaring.DateTime) end of date range
- match (boolean) true if a positive match, false for negative match

Raise InvalidArgument - start is less than end

Raise NullArgument - start or end is null

compliance: mandatory – This method must be implemented.

### match\_any\_end\_date(match)

Matches reports with any end date set.

Parameters match (boolean) - true to match any end date, false to match no start date

compliance: mandatory – This method must be implemented.

### end\_date\_terms

### match\_interpolated(match)

Match reports that are interpolated.

**Parameters match** (boolean) – true to match any interpolated reports, false to match non-interpolated reports

compliance: mandatory – This method must be implemented.

# interpolated\_terms

## match\_extrapolated(match)

Match reports that are extrapolated.

**Parameters match** (boolean) – true to match any extrapolated reports, false to match non-extrapolated reports

compliance: mandatory – This method must be implemented.

## extrapolated\_terms

# **Osid Capsule Query**

### class dlkit.osid.queries.OsidCapsuleQuery

Bases: dlkit.osid.queries.OsidQuery

This is the query interface for searching capsulating interfaces.

Each method specifies an AND term while multiple invocations of the same method produce a nested OR.

# Metadata

# Metadata

class dlkit.osid.metadata.Metadata

The Metadata interface defines a set of methods describing a the syntax and rules for creating and updating a data element inside an OsidForm.

This interface provides a means to retrieve special restrictions placed upon data elements such as sizes and ranges that may vary from provider to provider or from object to object.

## element\_id

Gets a unique Id for the data element.

Returns an Id

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

# element\_label

Gets a display label for the data element.

Returns a display label

Return type osid.locale.DisplayText

compliance: mandatory – This method must be implemented.

# instructions

Gets instructions for updating this element value.

This is a human readable description of the data element or property that may include special instructions or caveats to the end-user above and beyond what this interface provides.

**Returns** instructions

Return type osid.locale.DisplayText

compliance: mandatory – This method must be implemented.

### syntax

Gets the syntax of this data.

**Returns** an enumeration indicating thetype of value

Return type osid.Syntax

compliance: mandatory – This method must be implemented.

# is\_array()

Tests if this data element is an array.

Returns true if this data is an array, false if a single element

Return type boolean

compliance: mandatory – This method must be implemented.

### is\_required()

Tests if this data element is required for creating new objects.

Returns true if this element value is required, false otherwise

Return type boolean

## is\_read\_only()

Tests if this data can be updated.

This may indicate the result of a pre-authorization but is not a guarantee that an authorization failure will not occur when the create or update transaction is issued.

**Returns** true if this data is not updatable, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### is\_linked()

Tests if this data element is linked to other data in the object.

Updating linked data elements should refresh all metadata and revalidate object elements.

**Returns** true if this element is linked, false if updates have no side effect

Return type boolean

compliance: mandatory – This method must be implemented.

## is\_value\_known()

Tests if an existing value is known for this data element.

If it is known that a value does not exist, then this method returns true.

Returns true if the element value is known, false if the element value is not known

Return type boolean

compliance: mandatory – This method must be implemented.

# has\_value()

Tests if this data element has a set non-default value.

Returns true if this element value has been set, false otherwise

Return type boolean

**Raise** IllegalState - is\_value\_known() is false

compliance: mandatory – This method must be implemented.

## units

Gets the units of this data for display purposes ('lbs', 'gills', 'furlongs').

Returns the display units of this data or an empty string if not applicable

Return type osid.locale.DisplayText

compliance: mandatory – This method must be implemented.

### minimum\_elements

In the case where an array or list of elements is specified in an OsidForm, this specifies the minimum number of elements that must be included.

**Returns** the minimum elements or 1 if is\_array() is false

Return type cardinal

compliance: mandatory – This method must be implemented.

### maximum\_elements

In the case where an array or list of elements is specified in an OsidForm, this specifies the maximum number of elements that can be specified.

Returns the maximum elements or 1 if is\_array() is false

**Return type** cardinal

compliance: mandatory – This method must be implemented.

### minimum\_cardinal

Gets the minimum cardinal value.

**Returns** the minimum cardinal

Return type cardinal

**Raise** IllegalState – syntax is not a CARDINAL

compliance: mandatory – This method must be implemented.

#### maximum\_cardinal

Gets the maximum cardinal value.

**Returns** the maximum cardinal

Return type cardinal

**Raise** IllegalState – syntax is not a CARDINAL

compliance: mandatory – This method must be implemented.

## cardinal\_set

Gets the set of acceptable cardinal values.

**Returns** a set of cardinals or an empty array if not restricted

Return type cardinal

Raise IllegalState - syntax is not a CARDINAL

compliance: mandatory – This method must be implemented.

## default\_cardinal\_values

Gets the default cardinal values.

These are the values used if the element value is not provided or is cleared. If is\_array() is false, then this method returns at most a single value.

Returns the default cardinal values

Return type cardinal

Raise IllegalState - syntax is not a CARDINAL or is\_required() is true

compliance: mandatory – This method must be implemented.

# existing\_cardinal\_values

Gets the existing cardinal values.

If has\_value() and is\_required() are false, then these values are the default values ". If ``is\_array() is false, then this method returns at most a single value.

Returns the existing cardinal values

Return type cardinal

Raise IllegalState - syntax is not a CARDINAL or is\_value\_known () is false

compliance: mandatory – This method must be implemented.

# coordinate\_types

Gets the set of acceptable coordinate types.

Returns the set of coordinate types

Return type osid.type.Type

Raise IllegalState - syntax is not a COORDINATE or SPATIALUNIT

compliance: mandatory – This method must be implemented.

## supports\_coordinate\_type (coordinate\_type)

Tests if the given coordinate type is supported.

**Parameters coordinate\_type** (osid.type.Type) - a coordinate Type

**Returns** true if the type is supported, false otherwise

Return type boolean

**Raise** IllegalState – syntax is not a COORDINATE

**Raise** NullArgument - coordinate\_type is null

compliance: mandatory – This method must be implemented.

## get\_axes\_for\_coordinate\_type (coordinate\_type)

Gets the number of axes for a given supported coordinate type.

Parameters coordinate\_type (osid.type.Type) - a coordinate Type

Returns the number of axes

Return type cardinal

**Raise** IllegalState – syntax is not a COORDINATE

**Raise** NullArgument - coordinate\_type is null

Raise Unsupported - supports\_coordinate\_type(coordinate\_type) is
false

compliance: mandatory – This method must be implemented.

### get\_minimum\_coordinate\_values(coordinate\_type)

Gets the minimum coordinate values given supported coordinate type.

**Parameters coordinate\_type** (osid.type.Type) - a coordinate Type

Returns the minimum coordinate values

Return type decimal

Raise IllegalState - syntax is not a COORDINATE

Raise NullArgument - coordinate\_type is null

Raise Unsupported - supports\_coordinate\_type(coordinate\_type) is
false

compliance: mandatory – This method must be implemented.

## get\_maximum\_coordinate\_values(coordinate\_type)

Gets the maximum coordinate values given supported coordinate type.

Parameters coordinate\_type (osid.type.Type) - a coordinate Type

**Returns** the maximum coordinate values

Return type decimal

Raise IllegalState - syntax is not a COORDINATE

**Raise** NullArgument - coordinate\_type is null

Raise Unsupported - supports\_coordinate\_type(coordinate\_type) is
false

compliance: mandatory – This method must be implemented.

### coordinate\_set

Gets the set of acceptable coordinate values.

Returns a set of coordinates or an empty array if not restricted

Return type osid.mapping.Coordinate

**Raise** IllegalState – syntax is not a COORDINATE

compliance: mandatory – This method must be implemented.

## default\_coordinate\_values

Gets the default coordinate values.

These are the values used if the element value is not provided or is cleared. If is\_array() is false, then this method returns at most a single value.

Returns the default coordinate values

Return type osid.mapping.Coordinate

Raise IllegalState - syntax is not a COORDINATE or is\_required() is true

compliance: mandatory – This method must be implemented.

## existing\_coordinate\_values

Gets the existing coordinate values.

If has\_value() and is\_required() are false, then these values are the default values ". If ``is\_array() is false, then this method returns at most a single value.

**Returns** the existing coordinate values

Return type osid.mapping.Coordinate

Raise IllegalState - syntax is not a COORDINATE or is\_value\_known () is false

compliance: mandatory – This method must be implemented.

### currency\_types

Gets the set of acceptable currency types.

**Returns** the set of currency types

Return type osid.type.Type

**Raise** IllegalState – syntax is not a CURRENCY

compliance: mandatory – This method must be implemented.

# supports\_currency\_type (currency\_type)

Tests if the given currency type is supported.

Parameters currency\_type (osid.type.Type) - a currency Type

Returns true if the type is supported, false otherwise

Return type boolean

Raise IllegalState - syntax is not a CURRENCY

**Raise** NullArgument - currency\_type is null

compliance: mandatory – This method must be implemented.

### minimum\_currency

Gets the minimum currency value.

Returns the minimum currency

Return type osid.financials.Currency

**Raise** IllegalState – syntax is not a CURRENCY

compliance: mandatory – This method must be implemented.

# maximum\_currency

Gets the maximum currency value.

**Returns** the maximum currency

Return type osid.financials.Currency

**Raise** IllegalState - syntax is not a CURRENCY

*compliance: mandatory – This method must be implemented.* 

### currency\_set

Gets the set of acceptable currency values.

Returns a set of currencies or an empty array if not restricted

**Return type** osid.financials.Currency

**Raise** IllegalState – syntax is not a CURRENCY

compliance: mandatory – This method must be implemented.

# default\_currency\_values

Gets the default currency values.

These are the values used if the element value is not provided or is cleared. If is\_array() is false, then this method returns at most a single value.

**Returns** the default currency values

Return type osid.financials.Currency

**Raise** IllegalState - syntax is not a CURRENCY or is\_required() is true

compliance: mandatory – This method must be implemented.

# existing\_currency\_values

Gets the existing currency values.

If has\_value() and is\_required() are false, then these values are the default values ". If ``is\_array() is false, then this method returns at most a single value.

Returns the existing currency values

Return type osid.financials.Currency

**Raise** IllegalState - syntax is not a CURRENCY or is\_value\_known() is false

compliance: mandatory – This method must be implemented.

# date\_time\_resolution

Gets the smallest resolution of the date time value.

Returns the resolution

**Return type** osid.calendaring.DateTimeResolution

**Raise** IllegalState - syntax is not a DATETIME, DURATION, or TIME

*compliance: mandatory – This method must be implemented.* 

### calendar\_types

Gets the set of acceptable calendar types.

**Returns** the set of calendar types

Return type osid.type.Type

Raise IllegalState - syntax is not a DATETIME or DURATION

compliance: mandatory – This method must be implemented.

## supports\_calendar\_type (calendar\_type)

Tests if the given calendar type is supported.

**Parameters calendar\_type** (osid.type.Type) - a calendar Type

Returns true if the type is supported, false otherwise

Return type boolean

**Raise** IllegalState – syntax is not a DATETIME or DURATION

**Raise** NullArgument - calendar\_type is null

compliance: mandatory – This method must be implemented.

### time\_types

Gets the set of acceptable time types.

**Returns** a set of time types or an empty array if not restricted

Return type osid.type.Type

**Raise** IllegalState - syntax is not a DATETIME, DURATION, or TIME

compliance: mandatory – This method must be implemented.

### supports\_time\_type (time\_type)

Tests if the given time type is supported.

**Parameters time\_type** (osid.type.Type) - a time Type

**Returns** true if the type is supported, false otherwise

Return type boolean

**Raise** IllegalState - syntax is not a DATETIME, DURATION, or TIME

**Raise** NullArgument - time\_type is null

*compliance: mandatory – This method must be implemented.* 

## minimum\_date\_time

Gets the minimum date time value.

Returns the minimum value

Return type osid.calendaring.DateTime

**Raise** IllegalState – syntax is not a DATETIME

compliance: mandatory – This method must be implemented.

# maximum\_date\_time

Gets the maximum date time value.

Returns the maximum value

Return type osid.calendaring.DateTime

**Raise** IllegalState – syntax is not a DATETIME

compliance: mandatory – This method must be implemented.

### date\_time\_set

Gets the set of acceptable date time values.

**Returns** a set of values or an empty array if not restricted

Return type osid.calendaring.DateTime

**Raise** IllegalState – syntax is not a DATETIME

*compliance: mandatory – This method must be implemented.* 

# default\_date\_time\_values

Gets the default date time values.

These are the values used if the element value is not provided or is cleared. If is\_array() is false, then this method returns at most a single value.

Returns the default date time values

Return type osid.calendaring.DateTime

**Raise** IllegalState - syntax is not a DATETIME or is\_required() is true

compliance: mandatory – This method must be implemented.

### existing\_date\_time\_values

Gets the existing date time values.

If has\_value() and is\_required() are false, then these values are the default values ". If ``is\_array() is false, then this method returns at most a single value.

**Returns** the existing date time values

Return type osid.calendaring.DateTime

**Raise** IllegalState - syntax is not a DATETIME or is\_value\_known() is false

compliance: mandatory – This method must be implemented.

### decimal\_scale

Gets the number of digits to the right of the decimal point.

Returns the scale

Return type cardinal

**Raise** IllegalState – syntax is not a DECIMAL

compliance: mandatory – This method must be implemented.

### minimum\_decimal

Gets the minimum decimal value.

Returns the minimum decimal

Return type decimal

**Raise** IllegalState – syntax is not a DECIMAL

### maximum\_decimal

Gets the maximum decimal value.

Returns the maximum decimal

Return type decimal

**Raise** IllegalState – syntax is not a DECIMAL

*compliance: mandatory – This method must be implemented.* 

# decimal\_set

Gets the set of acceptable decimal values.

**Returns** a set of decimals or an empty array if not restricted

Return type decimal

Raise IllegalState - syntax is not a DECIMAL

compliance: mandatory – This method must be implemented.

## default\_decimal\_values

Gets the default decimal values.

These are the values used if the element value is not provided or is cleared. If is\_array() is false, then this method returns at most a single value.

Returns the default decimal values

Return type decimal

**Raise** IllegalState - syntax is not a DECIMAL or is\_required() is true

compliance: mandatory – This method must be implemented.

### existing\_decimal\_values

Gets the existing decimal values.

If has\_value() and is\_required() are false, then these values are the default values ". If ``is\_array() is false, then this method returns at most a single value.

Returns the existing decimal values

Return type decimal

**Raise** IllegalState - syntax is not a DECIMAL or is\_value\_known() is false

compliance: mandatory – This method must be implemented.

## distance\_resolution

Gets the smallest resolution of the distance value.

**Returns** the resolution

Return type osid.mapping.DistanceResolution

**Raise** IllegalState – syntax is not a DISTANCE

compliance: mandatory – This method must be implemented.

### minimum\_distance

Gets the minimum distance value.

Returns the minimum value

Return type osid.mapping.Distance

**Raise** IllegalState – syntax is not a DISTANCE

compliance: mandatory – This method must be implemented.

### maximum\_distance

Gets the maximum distance value.

**Returns** the maximum value

Return type osid.mapping.Distance

**Raise** IllegalState – syntax is not a DISTANCE

*compliance: mandatory – This method must be implemented.* 

# distance\_set

Gets the set of acceptable distance values.

**Returns** a set of values or an empty array if not restricted

Return type osid.mapping.Distance

**Raise** IllegalState – syntax is not a DISTANCE

compliance: mandatory – This method must be implemented.

## default\_distance\_values

Gets the default distance values.

These are the values used if the element value is not provided or is cleared. If is\_array() is false, then this method returns at most a single value.

**Returns** the default distance values

Return type osid.mapping.Distance

Raise IllegalState - syntax is not a DISTANCE or is\_required() is true

compliance: mandatory – This method must be implemented.

# existing\_distance\_values

Gets the existing distance values.

If has\_value() and is\_required() are false, then these values are the default values ". If ``is\_array() is false, then this method returns at most a single value.

**Returns** the existing distance values

Return type osid.mapping.Distance

**Raise** IllegalState - syntax is not a DISTANCE or is\_value\_known() is false

compliance: mandatory – This method must be implemented.

## minimum\_duration

Gets the minimum duration.

Returns the minimum duration

Return type osid.calendaring.Duration

**Raise** IllegalState - syntax is not a DURATION

compliance: mandatory – This method must be implemented.

# maximum\_duration

Gets the maximum duration.

Returns the maximum duration

Return type osid.calendaring.Duration

**Raise** IllegalState – syntax is not a DURATION

compliance: mandatory – This method must be implemented.

### duration\_set

Gets the set of acceptable duration values.

**Returns** a set of durations or an empty array if not restricted

Return type osid.calendaring.Duration

**Raise** IllegalState - syntax is not a DURATION

compliance: mandatory – This method must be implemented.

## default\_duration\_values

Gets the default duration values.

These are the values used if the element value is not provided or is cleared. If is\_array() is false, then this method returns at most at most a single value.

**Returns** the default duration values

Return type osid.calendaring.Duration

Raise IllegalState - syntax is not a DURATION or is\_required() is true

compliance: mandatory – This method must be implemented.

# existing\_duration\_values

Gets the existing duration values.

If has\_value() and is\_required() are false, then these values are the default values ". If ``is\_array() is false, then this method returns at most a single value.

Returns the existing duration values

Return type osid.calendaring.Duration

**Raise** IllegalState - syntax is not a DURATION or is\_value\_known() is false

compliance: mandatory – This method must be implemented.

# heading\_types

Gets the set of acceptable heading types.

**Returns** a set of heading types or an empty array if not restricted

Return type osid.type.Type

Raise IllegalState - syntax is not a HEADING

compliance: mandatory – This method must be implemented.

### supports\_heading\_type(heading\_type)

Tests if the given heading type is supported.

**Parameters heading\_type** (osid.type.Type) - a heading Type

**Returns** true if the type is supported, false otherwise

Return type boolean

Raise IllegalState - syntax is not a HEADING

**Raise** NullArgument - heading\_type is null

# get\_axes\_for\_heading\_type (heading\_type)

Gets the number of axes for a given supported heading type.

Parameters heading\_type (osid.type.Type) - a heading Type

Returns the number of axes

Return type cardinal

**Raise** IllegalState – syntax is not a HEADING

Raise NullArgument - heading\_type is null

Raise Unsupported - supports\_heading\_type (heading\_type) is false

compliance: mandatory – This method must be implemented.

### get\_minimum\_heading\_values (heading\_type)

Gets the minimum heading values given supported heading type.

Parameters heading\_type (osid.type.Type) - a heading Type

**Returns** the minimum heading values

Return type decimal

Raise IllegalState - syntax is not a HEADING

Raise NullArgument - heading\_type is null

**Raise** Unsupported - supports\_heading\_type (heading\_type) is false

*compliance: mandatory – This method must be implemented.* 

# get\_maximum\_heading\_values(heading\_type)

Gets the maximum heading values given supported heading type.

Parameters heading\_type (osid.type.Type) - a heading Type

Returns the maximum heading values

Return type decimal

**Raise** IllegalState - syntax is not a HEADING

Raise NullArgument - heading\_type is null

**Raise** Unsupported - supports\_heading\_type (heading\_type) is false

compliance: mandatory – This method must be implemented.

### heading\_set

Gets the set of acceptable heading values.

**Returns** the set of heading

Return type osid.mapping.Heading

Raise IllegalState - syntax is not a HEADING

compliance: mandatory – This method must be implemented.

### default\_heading\_values

Gets the default heading values.

These are the values used if the element value is not provided or is cleared. If is\_array() is false, then this method returns at most a single value.

**Returns** the default heading values

Return type osid.mapping.Heading

**Raise** IllegalState - syntax is not a HEADING or is\_required() is true

compliance: mandatory – This method must be implemented.

## existing\_heading\_values

Gets the existing heading values.

If has\_value() and is\_required() are false, then these values are the default values ". If ``is\_array() is false, then this method returns at most a single value.

**Returns** the existing heading values

Return type osid.mapping.Heading

**Raise** IllegalState - syntax is not a HEADING or is\_value\_known() is false

compliance: mandatory – This method must be implemented.

## id\_set

Gets the set of acceptable Ids.

Returns a set of Ids or an empty array if not restricted

Return type osid.id.Id

Raise IllegalState - syntax is not an ID

compliance: mandatory – This method must be implemented.

## default\_id\_values

Gets the default Id values.

These are the values used if the element value is not provided or is cleared. If is\_array() is false, then this method returns at most a single value.

Returns the default Id values

Return type osid.id.Id

**Raise** IllegalState - syntax is not an ID or is\_required() is true

compliance: mandatory – This method must be implemented.

# existing\_id\_values

Gets the existing Id values.

If has\_value() and is\_required() are false, then these values are the default values ". If ``is\_array() is false, then this method returns at most a single value.

**Returns** the existing Id values

Return type osid.id.Id

Raise IllegalState - syntax is not an ID

compliance: mandatory – This method must be implemented.

### minimum\_integer

Gets the minimum integer value.

Returns the minimum value

Return type integer

**Raise** IllegalState – syntax is not an INTEGER

## maximum\_integer

Gets the maximum integer value.

**Returns** the maximum value

Return type integer

**Raise** IllegalState – syntax is not an INTEGER

### *compliance: mandatory – This method must be implemented.*

# integer\_set

Gets the set of acceptable integer values.

**Returns** a set of values or an empty array if not restricted

Return type integer

**Raise** IllegalState – syntax is not an INTEGER

compliance: mandatory – This method must be implemented.

## default\_integer\_values

Gets the default integer values.

These are the values used if the element value is not provided or is cleared. If is\_array() is false, then this method returns at most a single value.

Returns the default integer values

**Return type** integer

**Raise** IllegalState - syntax is not an INTEGER or is\_required() is true

compliance: mandatory – This method must be implemented.

### existing\_integer\_values

Gets the existing integer values.

If has\_value() and is\_required() are false, then these values are the default values ". If ``is\_array() is false, then this method returns at most a single value.

**Returns** the existing integer values

Return type integer

**Raise** IllegalState – syntax is not a INTEGER or isValueKnown() is false

compliance: mandatory – This method must be implemented.

### object\_types

Gets the set of acceptable Types for an arbitrary object.

**Returns** a set of Types or an empty array if not restricted

Return type osid.type.Type

Raise IllegalState - syntax is not an OBJECT

compliance: mandatory – This method must be implemented.

### supports\_object\_type (object\_type)

Tests if the given object type is supported.

Parameters object\_type (osid.type.Type) - an object Type

**Returns** true if the type is supported, false otherwise

Return type boolean

**Raise** IllegalState – syntax is not an OBJECT

**Raise** NullArgument - object\_type is null

compliance: mandatory – This method must be implemented.

### object\_set

Gets the set of acceptable object values.

**Returns** a set of values or an empty array if not restricted

Return type object

Raise IllegalState - syntax is not an OBJECT

compliance: mandatory – This method must be implemented.

## default\_object\_values

Gets the default object values.

These are the values used if the element value is not provided or is cleared. If is\_array() is false, then this method returns at most a single value.

**Returns** the default object values

Return type object

Raise IllegalState - syntax is not an OBJECT or is\_required() is true

compliance: mandatory - This method must be implemented.

# existing\_object\_values

Gets the existing object values.

If has\_value() and is\_required() are false, then these values are the default values ". If ``is\_array() is false, then this method returns at most a single value.

**Returns** the existing object values

Return type object

**Raise** IllegalState - syntax is not an OBJECT or is\_value\_known() is false

compliance: mandatory – This method must be implemented.

### spatial\_unit\_record\_types

Gets the set of acceptable spatial unit record types.

Returns the set of spatial unit types

Return type osid.type.Type

Raise IllegalState - syntax is not SPATIALUNIT

compliance: mandatory – This method must be implemented.

# supports\_spatial\_unit\_record\_type (spatial\_unit\_record\_type)

Tests if the given spatial unit record type is supported.

Parameters spatial\_unit\_record\_type (osid.type.Type) - a spatial unit record Type

Returns true if the type is supported, false otherwise

Return type boolean

Raise IllegalState - syntax is not an SPATIALUNIT

Raise NullArgument - spatial\_unit\_record\_type is null

compliance: mandatory – This method must be implemented.

#### spatial\_unit\_set

Gets the set of acceptable spatial unit values.

Returns a set of spatial units or an empty array if not restricted

Return type osid.mapping.SpatialUnit

**Raise** IllegalState – syntax is not a SPATIALUNIT

compliance: mandatory – This method must be implemented.

# default\_spatial\_unit\_values

Gets the default spatial unit values.

These are the values used if the element value is not provided or is cleared. If is\_array() is false, then this method returns at most a single value.

**Returns** the default spatial unit values

Return type osid.mapping.SpatialUnit

Raise IllegalState - syntax is not a SPATIALUNIT or is\_required() is true

compliance: mandatory – This method must be implemented.

# existing\_spatial\_unit\_values

Gets the existing spatial unit values.

If has\_value() and is\_required() are false, then these values are the default values ". If ``is\_array() is false, then this method returns at most a single value.

Returns the existing spatial unit values

Return type osid.mapping.SpatialUnit

**Raise** IllegalState - syntax is not a SPATIALUNIT or is\_value\_known() is false

compliance: mandatory – This method must be implemented.

## minimum\_speed

Gets the minimum speed value.

**Returns** the minimum speed

Return type osid.mapping.Speed

Raise IllegalState - syntax is not a SPEED

compliance: mandatory – This method must be implemented.

### maximum\_speed

Gets the maximum speed value.

**Returns** the maximum speed

Return type osid.mapping.Speed

Raise IllegalState - syntax is not a SPEED

compliance: mandatory – This method must be implemented.

### speed\_set

Gets the set of acceptable speed values.

Returns a set of speeds or an empty array if not restricted

Return type osid.mapping.Speed

**Raise** IllegalState – syntax is not a SPEED

compliance: mandatory – This method must be implemented.

# default\_speed\_values

Gets the default speed values.

These are the values used if the element value is not provided or is cleared. If is\_array() is false, then this method returns at most a single value.

Returns the default speed values

Return type osid.mapping.Speed

**Raise** IllegalState - syntax is not a SPEED or is\_required() is true

compliance: mandatory – This method must be implemented.

## existing\_speed\_values

Gets the existing speed values.

If has\_value() and is\_required() are false, then these values are the default values ". If ``is\_array() is false, then this method returns at most a single value.

**Returns** the existing speed values

Return type osid.mapping.Speed

Raise IllegalState - syntax is not a SPEED or is\_value\_known() is false

compliance: mandatory – This method must be implemented.

### minimum\_string\_length

Gets the minimum string length.

**Returns** the minimum string length

Return type cardinal

**Raise** IllegalState – syntax is not a STRING

compliance: mandatory – This method must be implemented.

### maximum\_string\_length

Gets the maximum string length.

**Returns** the maximum string length

Return type cardinal

Raise IllegalState - syntax is not a STRING

compliance: mandatory – This method must be implemented.

### string\_match\_types

Gets the set of valid string match types for use in validating a string.

If the string match type indicates a regular expression then get\_string\_expression() returns a regular expression.

**Returns** the set of string match types

Return type osid.type.Type

Raise IllegalState - syntax is not a STRING

## **supports\_string\_match\_type** (*string\_match\_type*) Tests if the given string match type is supported.

**Parameters string\_match\_type** (osid.type.Type) - a string match type

**Returns** true if the given string match type Is supported, false otherwise

Return type boolean

**Raise** IllegalState – syntax is not a STRING

**Raise** NullArgument - string\_match\_type is null

compliance: mandatory – This method must be implemented.

### get\_string\_expression (string\_match\_type)

Gets the regular expression of an acceptable string for the given string match type.

**Parameters string\_match\_type** (osid.type.Type) - a string match type

Returns the regular expression

Return type string

**Raise** NullArgument - string\_match\_type is null

Raise IllegalState - syntax is not a STRING

Raise Unsupported - supports\_string\_match\_type(string\_match\_type) is
 false

compliance: mandatory – This method must be implemented.

## string\_format\_types

Gets the set of valid string formats.

**Returns** the set of valid text format types

Return type osid.type.Type

**Raise** IllegalState – syntax is not a STRING

compliance: mandatory – This method must be implemented.

# string\_set

Gets the set of acceptable string values.

**Returns** a set of strings or an empty array if not restricted

Return type string

Raise IllegalState - syntax is not a STRING

compliance: mandatory – This method must be implemented.

# default\_string\_values

Gets the default string values.

These are the values used if the element value is not provided or is cleared. If is\_array() is false, then this method returns at most a single value.

**Returns** the default string values

Return type string

Raise IllegalState - syntax is not a STRING or is\_required() is true

### existing\_string\_values

Gets the existing string values.

If has\_value() and is\_required() are false, then these values are the default values ". If ``is\_array() is false, then this method returns at most a single value.

**Returns** the existing string values

Return type string

**Raise** IllegalState - syntax is not a STRING or is\_value\_known() is false

compliance: mandatory – This method must be implemented.

### minimum\_time

Gets the minimum time value.

Returns the minimum time

Return type osid.calendaring.Time

**Raise** IllegalState – syntax is not a TIME

compliance: mandatory – This method must be implemented.

# maximum\_time

Gets the maximum time value.

Returns the maximum time

Return type osid.calendaring.Time

**Raise** IllegalState – syntax is not a TIME

compliance: mandatory – This method must be implemented.

### time\_set

Gets the set of acceptable time values.

**Returns** a set of times or an empty array if not restricted

Return type osid.calendaring.Time

**Raise** IllegalState – syntax is not a TIME

compliance: mandatory – This method must be implemented.

## default\_time\_values

Gets the default time values.

These are the values used if the element value is not provided or is cleared. If is\_array() is false, then this method returns at most a single value.

**Returns** the default time values

Return type osid.calendaring.Time

Raise IllegalState - syntax is not a TIME or is\_required() is true

compliance: mandatory – This method must be implemented.

## existing\_time\_values

Gets the existing time values.

If has\_value() and is\_required() are false, then these values are the default values ". If ``is\_array() is false, then this method returns at most a single value.

**Returns** the existing time values

Return type osid.calendaring.Time

**Raise** IllegalState - syntax is not a TIME or is\_value\_known() is false

compliance: mandatory – This method must be implemented.

# type\_set

Gets the set of acceptable Types.

**Returns** a set of Types or an empty array if not restricted

Return type osid.type.Type

Raise IllegalState - syntax is not a TYPE

compliance: mandatory – This method must be implemented.

## default\_type\_values

Gets the default type values.

These are the values used if the element value is not provided or is cleared. If is\_array() is false, then this method returns at most a single value.

**Returns** the default type values

Return type osid.type.Type

Raise IllegalState - syntax is not a TYPE or is\_required() is true

compliance: mandatory – This method must be implemented.

# existing\_type\_values

Gets the existing type values.

If has\_value() and is\_required() are false, then these values are the default values ". If ``is\_array() is false, then this method returns at most a single value.

**Returns** the existing type values

Return type osid.type.Type

Raise IllegalState - syntax is not a TYPE or is\_value\_known() is false

compliance: mandatory – This method must be implemented.

#### version\_types

Gets the set of acceptable version types.

Returns the set of version types

Return type osid.type.Type

Raise IllegalState - syntax is not a VERSION

compliance: mandatory – This method must be implemented.

# supports\_version\_type (version\_type)

Tests if the given version type is supported.

**Parameters version\_type** (osid.type.Type) - a version Type

**Returns** true if the type is supported, false otherwise

Return type boolean

**Raise** IllegalState – syntax is not a VERSION

Raise NullArgument - version\_type is null

compliance: mandatory – This method must be implemented.

#### minimum\_version

Gets the minumim acceptable Version.

Returns the minumim Version

Return type osid.installation.Version

**Raise** IllegalState – syntax is not a VERSION

compliance: mandatory – This method must be implemented.

# maximum\_version

Gets the maximum acceptable Version.

Returns the maximum Version

Return type osid.installation.Version

Raise IllegalState - syntax is not a VERSION

*compliance: mandatory – This method must be implemented.* 

#### version\_set

Gets the set of acceptable Versions.

Returns a set of Versions or an empty array if not restricted

**Return type** osid.installation.Version

**Raise** IllegalState – syntax is not a VERSION

compliance: mandatory – This method must be implemented.

# default\_version\_values

Gets the default version values.

These are the values used if the element value is not provided or is cleared. If is\_array() is false, then this method returns at most a single value.

**Returns** the default version values

Return type osid.installation.Version

Raise IllegalState - syntax is not a TIME or isValueKnown() is false

compliance: mandatory – This method must be implemented.

# existing\_version\_values

Gets the existing version values.

If has\_value() and is\_required() are false, then these values are the default values ". If ``is\_array() is false, then this method returns at most a single value.

Returns the existing version values

Return type osid.installation.Version

Raise IllegalState - syntax is not a VERSION or is\_value\_known() is false

# **Records**

# **Osid Record**

```
class dlkit.osid.records.OsidRecord
```

OsidRecord is a top-level interface for all record objects.

A record is an auxiliary interface that can be retrieved from an OSID object, query, form or search order that contains method definitions outside the core OSID specification. An OSID record interface specification is identified with a  $T_{ype}$ .

# implements\_record\_type (record\_type)

Tests if the given type is implemented by this record.

Other types than that directly indicated by  $get_type()$  may be supported through an inheritance scheme where the given type specifies a record that is a parent interface of the interface specified by getType().

Parameters record\_type (osid.type.Type) - a type

Returns true if the given record Type is implemented by this record, false otherwise

Return type boolean

Raise NullArgument - record\_type is null

compliance: mandatory – This method must be implemented.

# **Rules**

# **Osid Condition**

```
class dlkit.osid.rules.OsidCondition
Bases: dlkit.osid.markers.Extensible, dlkit.osid.markers.Suppliable
```

The OsidCondition is used to input conditions into a rule for evaluation.

# **Osid Input**

```
class dlkit.osid.rules.OsidInput
Bases: dlkit.osid.markers.Extensible, dlkit.osid.markers.Suppliable
```

The OsidInput is used to input conditions into a rule for processing.

# **Osid Result**

```
class dlkit.osid.rules.OsidResult
    Bases: dlkit.osid.markers.Extensible, dlkit.osid.markers.Browsable
```

The OsidResult is used to retrieve the result of processing a rule.

# Proxy

# Summary

Proxy Open Service Interface Definitions proxy version 3.0.0

The Proxy OSID helps a consumer map external data, such as that received via a server request, into a Proxy that can be used with OSID proxy managers. Then purpose of this OSID is to modularize assumptions made about the input data into another OSID Provider, such as the authentication or localization information.

The Proxy represents the OsidResult of an evaluation of the input OsidCondition performed by the Proxy OSID Provider. The resulting Proxy is meant to be passed to OsidProxyManagers. The Proxy OSID is the glue between the application server environment and the OSID services.

The input data may be anything acceptable to a ProxyCondition record Type. The ProxyCondition record Types are aligned with the application server environment while the Proxy record Types are aligned with OSID Providers. This alignment poses various interoperability issues and as such it might be helpful to be very broad in what may be specified in a ProxyCondition so that this service may produce the variety of Proxy records needed by the services in the OSID environment.

Some data is defined in the ProxyCondition. This in no way implies support of this input by an OSID Provider. The resulting OsidSession indicates what actually happened.

Example

An example using a specifier record for an http request: ProxyCondition					condition	
=	proxySession.getProxyCondition();	HttpRequestRecord	record	=	condi-	
tion.getProxyConditionRecord(httpRequestRecordType); record.setHttpRequest(servletRequest);						

Proxy proxy = proxySession.getProxy(condition);

Proxy Open Service Interface Definitions proxy version 3.0.0

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Proxy proxy = proxySession.getProxy(condition);

# **Service Managers**

# **Proxy Profile**

class dlkit.services.proxy.ProxyProfile

Bases: dlkit.osid.managers.OsidProfile

The ProxyProfile describes the interoperability among proxy services.

supports\_proxy()

Tests if a proxy session is supported.

Returns true if proxy is supported , false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### proxy\_record\_types

Gets the supported Proxy record interface types.

**Returns** a list containing the supported Proxy record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

# proxy\_condition\_record\_types

Gets the supported ProxyCondition record interface types.

**Returns** a list containing the supported ProxyCondition record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

# **Records**

# **Proxy Record**

class dlkit.proxy.records.ProxyRecord Bases: dlkit.osid.records.OsidRecord

A record for a Proxy.

The methods specified by the record type are available through the underlying object.

# **Proxy Condition Record**

class dlkit.proxy.records.ProxyConditionRecord Bases: dlkit.osid.records.OsidRecord

A record for a ProxyCondition.

The methods specified by the record type are available through the underlying object.

# **Rules**

# **Proxy**

```
class dlkit.proxy.rules.Proxy
Bases: dlkit.osid.rules.OsidResult
```

A Proxy is used to transfer external information from an application server into an OSID Provider.

#### **has\_authentication**() Tests if an authentication is available.

Returns true if an Authentication is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# authentication

Gets the Authentication for this proxy.

Returns the authentication

Return type osid.authentication.process.Authentication

Raise IllegalState - has\_authentication() is false

compliance: mandatory – This method must be implemented.

#### has\_effective\_agent()

Tests if an effective agent is available.

Returns true if an effective agent is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### effective\_agent\_id

Gets the effective Agent Id for this proxy.

Returns the effective agent Id

Return type osid.id.Id

**Raise** IllegalState - has\_effective\_agent() is false

compliance: mandatory – This method must be implemented.

## effective\_agent

Gets the effective Agent for this proxy.

**Returns** the effective agent

Return type osid.authentication.Agent

Raise IllegalState - has\_effective\_agent() is false

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

# has\_effective\_date()

Tests if an effective date is available.

**Returns** true if an effective date is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# effective\_date

Gets the effective date.

**Returns** the effective date

Return type timestamp

Raise IllegalState - has\_effective\_date() is false

## effective\_clock\_rate

Gets the rate of the clock.

Returns the rate

Return type decimal

Raise IllegalState - has\_effective\_date() is false

compliance: mandatory – This method must be implemented.

# locale

Gets the locale.

Returns a locale

Return type osid.locale.Locale

compliance: mandatory – This method must be implemented.

# has\_format\_type()

Tests if a DisplayText format Type is available.

**Returns** true if a format type is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## format\_type

Gets the DisplayText format Type.

**Returns** the format Type

Return type osid.type.Type

**Raise** IllegalState - has\_format\_type() is false

compliance: mandatory – This method must be implemented.

#### get\_proxy\_record (proxy\_record\_type)

Gets the proxy record corresponding to the given Proxy record Type.

This method is used to retrieve an object implementing the requested record. The proxy\_record\_type may be the Type returned in get\_record\_types () or any of its parents in a Type hierarchy where has\_record\_type (proxy\_record\_type) is true.

Parameters proxy\_record\_type (osid.type.Type) - the type of proxy record to retrieve

Returns the proxy record

Return type osid.proxy.records.ProxyRecord

**Raise** NullArgument - proxy\_record\_type is null

 $Raise \ {\tt OperationFailed-unable to \ complete \ request}$ 

Raise Unsupported - has\_record\_type (proxy\_record\_type) is false

# **Proxy Condition**

```
class dlkit.proxy.rules.ProxyCondition
Bases: dlkit.osid.rules.OsidCondition
```

A ProxyCondition is used to transfer external information into a proxy.

### effective\_agent\_id

set\_effective\_date(date, rate)

Sets the effective date.

Parameters

- date (timestamp) a date
- **rate** (decimal) the rate at which the clock should tick from the given effective date. 0 is a clock that is fixed

Raise NullArgument - date is null

compliance: mandatory – This method must be implemented.

language\_type

script\_type

calendar\_type

time\_type

currency\_type

unit\_system\_type

# format\_type

#### get\_proxy\_condition\_record (proxy\_condition\_type)

Gets the proxy condition record corresponding to the given Proxy record Type.

This method is used to retrieve an object implementing the requested record. The proxy\_record\_type may be the Type returned in get\_record\_types () or any of its parents in a Type hierarchy where has\_record\_type (proxy\_record\_type) is true.

**Parameters proxy\_condition\_type** (osid.type.Type) - the type of proxy condition record to retrieve

Returns the proxy condition record

Return type osid.proxy.records.ProxyConditionRecord

**Raise** NullArgument - proxy\_condition\_record\_type is null

Raise OperationFailed - unable to complete request

Raise Unsupported - has\_record\_type(proxy\_condition\_record\_type) is false

# Relationship

# Summary

Relationship Open Service Interface Definitions relationship version 3.0.0

The Relationship OSID provides the ability to relate and manage data between OsidObjects.

# Relationships

The Relationship OSID defines a Relationship that can be used to explicitly identify a relationship between two OSID Ids and manage information specific to the relationship.

The Relationship OSID is a building block on which relationships defined in the context of other OSIDs can be built. Examples of relationships include the enrollment record of a student in a Course or the commitment or a person to an Event.

The Relationship OSID depends on the relationship Type to indicate the nature of the relationship including its natural ordering between the source and destination Ids. A relationship of type "friend" may place the peers in either order and be queryable in either order. A relationship of type "parent" is between a father peer and a son peer, but not the other way around. Queries of the son peer based on the "parent" type is not equiavelent to queries of the father peer based on the "parent" type.

Such directional relationships may be accompanied by two types. An additional relationship type of "child" can be used with the son peer to determine the father peer. The directionality and the inverse among the types are part of the type definition.

# Family Cataloging

Relationships may be cataloged using the Family interface.

# Sub Packages

The Relationship OSID includes a Relationship Rules OSID for controlling the enable status of Relationships. Relationship Open Service Interface Definitions relationship version 3.0.0

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# Family Cataloging

Relationships may be cataloged using the Family interface.

Sub Packages

The Relationship OSID includes a Relationship Rules OSID for controlling the enable status of Relationships.

# Service Managers

# **Relationship Profile**

```
class dlkit.services.relationship.RelationshipProfile
Bases: dlkit.osid.managers.OsidProfile
```

The relationship profile describes the interoperability among relationship services.

# supports\_relationship\_lookup()

Tests if looking up relationships is supported.

Returns true if relationship lookup is supported, false otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

# supports\_relationship\_query()

Tests if querying relationships is supported.

Returns true if relationship query is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# supports\_relationship\_admin()

Tests if relationship administrative service is supported.

**Returns** true if relationship administration is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## supports\_family\_lookup()

Tests if looking up families is supported.

**Returns** true if family lookup is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## supports\_family\_admin()

Tests if familyadministrative service is supported.

**Returns** true if family administration is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# supports\_family\_hierarchy()

Tests for the availability of a family hierarchy traversal service.

**Returns** true if family hierarchy traversal is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented in all providers.

### supports\_family\_hierarchy\_design()

Tests for the availability of a family hierarchy design service.

Returns true if family hierarchy design is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### relationship\_record\_types

Gets the supported Relationship record types.

**Returns** a list containing the supported Relationship record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

### relationship\_search\_record\_types

Gets the supported Relationship search record types.

Returns a list containing the supported Relationship search record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

# family\_record\_types

Gets the supported Family record types.

Returns a list containing the supported Family types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

## family\_search\_record\_types

Gets the supported Family search record types.

**Returns** a list containing the supported Family search record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

# **Relationship Manager**

class dlkit.services.relationship.RelationshipManager (proxy=None)

Bases: dlkit.osid.managers.OsidManager, dlkit.osid.sessions.OsidSession, dlkit.services.relationship.RelationshipProfile

The relationship manager provides access to relationship sessions and provides interoperability tests for various aspects of this service.

The sessions included in this manager are:

•RelationshipLookupSession: a session to retrieve and examine relationships

•RelationshipQuerySession: a session to query relationships

•RelationshipSearchSession: a session to search for relationships

•RelationshipAdminSession: a session to manage relationships

•RelationshipNotificationSession: a session to receive notifications pertaining to relationship changes

•RelationshipFamilySession: a session to look up relationship to family mappings

•RelationshipFamilyAssignmentSession: a session to manage relationship to family catalog mappings

•RelationshipSmartFamilySession: a session to manage dynamic relationship families

•FamilyLookupSession: a session to retrieve families

•FamilyQuerySession: a session to query families

•FamilySearchSession: a session to search for families

•FamilyAdminSession: a session to create and delete families

•FamilyNotificationSession: a session to receive notifications pertaining to family changes

•FamilyHierarchySession: a session to traverse a hierarchy of families

•FamilyHierarchyDesignSession: a session to manage a family hierarchy

### relationship\_batch\_manager

Gets the relationship batch manager.

**Returns** a RelationshipBatchManager

Return type osid.relationship.batch.RelationshipBatchManager

Raise OperationFailed - unable to complete request

Raise Unimplemented - supports\_relationship\_batch() is false

compliance: optional – This method must be implemented if "supports\_relationship\_batch()" is "true".

# relationship\_rules\_manager

Gets the relationship rules manager.

Returns a RelationshipRulesManager

Return type osid.relationship.rules.RelationshipRulesManager

Raise OperationFailed - unable to complete request

Raise Unimplemented - supports\_relationship\_rules() is false

compliance: optional – This method must be implemented if "supports\_relationship\_rules()" is "true".

## **Family Lookup Methods**

```
RelationshipManager.can_lookup_families()
```

Tests if this user can perform Family lookups.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may not offer lookup operations to unauthorized users.

**Returns** false if lookup methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

RelationshipManager.use\_comparative\_family\_view()

The returns from the family methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory - This method is must be implemented.

```
RelationshipManager.use_plenary_family_view()
A complete view of the Family returns is desired.
```

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

```
RelationshipManager.get_family (family_id)
Gets the Family specified by its Id.
```

In plenary mode, the exact Id is found or a NotFound results. Otherwise, the returned Family may have a different Id than requested, such as the case where a duplicate Id was assigned to a Family and retained for compatibil

Parameters family\_id (osid.id.Id) - Id of the Family

Returns the family

Return type osid.relationship.Family

Raise NotFound - family\_id not found

Raise NullArgument - family\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method is must be implemented.

```
RelationshipManager.get_families_by_ids (family_ids)
```

Gets a FamilyList corresponding to the given IdList.

In plenary mode, the returned list contains all of the families specified in the Id list, in the order of the list, including duplicates, or an error results if an Id in the supplied list is not found or inaccessible. Otherwise, inaccessible families may be omitted from the list and may present the elements in any order including returning a unique set.

Parameters family\_ids (osid.id.IdList) - the list of Ids to retrieve

Returns the returned Family list

Return type osid.relationship.FamilyList

 $Raise \; \text{NotFound} - an \; \text{Id} \; \text{ was not found}$ 

Raise NullArgument - family\_ids is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

RelationshipManager.get\_families\_by\_genus\_type(family\_genus\_type)

Gets a FamilyList corresponding to the given family genus Type which does not include families of genus types derived from the specified Type.

In plenary mode, the returned list contains all known families or an error results. Otherwise, the returned list may contain only those families that are accessible through this session.

**Parameters family\_genus\_type** (osid.type.Type) – a family genus type

**Returns** the returned Family list

Return type osid.relationship.FamilyList

**Raise** NullArgument - family\_genus\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

```
RelationshipManager.get_families_by_parent_genus_type (family_genus_type)
Gets a FamilyList corresponding to the given family genus Type and include any additional
families with genus types derived from the specified Type.
```

In plenary mode, the returned list contains all known families or an error results. Otherwise, the returned list may contain only those families that are accessible through this session.

**Parameters family\_genus\_type** (osid.type.Type) - a family genus type

Returns the returned Family list

**Return type** osid.relationship.FamilyList

Raise NullArgument - family\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

RelationshipManager.get\_families\_by\_record\_type (family\_record\_type)

Gets a FamilyList containing the given family record Type.

In plenary mode, the returned list contains all known families or an error results. Otherwise, the returned list may contain only those families that are accessible through this session.

**Parameters family\_record\_type** (osid.type.Type) - a family record type

Returns the returned Family list

Return type osid.relationship.FamilyList

**Raise** NullArgument - family\_record\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

RelationshipManager.get\_families\_by\_provider(*resource\_id*) Gets a FamilyList from the given provider.

In plenary mode, the returned list contains all known families or an error results. Otherwise, the returned list may contain only those families that are accessible through this session.

Parameters resource\_id (osid.id.Id) - a resource Id Returns the returned Family list Return type osid.relationship.FamilyList Raise NullArgument - resource\_id is null Raise OperationFailed - unable to complete request Raise PermissionDenied - authorization failure compliance: mandatory – This method must be implemented.

RelationshipManager.families

Gets all families.

In plenary mode, the returned list contains all known families or an error results. Otherwise, the returned list may contain only those families that are accessible through this session.

Returns a list of families

Return type osid.relationship.FamilyList

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# **Family Admin Methods**

```
RelationshipManager.can_create_families()
```

Tests if this user can create families.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating a Family will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer create operations to unauthorized users.

**Returns** false if Family creation is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

RelationshipManager.can\_create\_family\_with\_record\_types (*family\_record\_types*) Tests if this user can create a single Family using the desired record types.

While RelationshipManager.getFamilyRecordTypes() can be used to examine which records are supported, this method tests which record(s) are required for creating a specific Family. Providing an empty array tests if a Family can be created with no records.

Parameters family\_record\_types (osid.type.Type[]) - array of family
 record types

**Returns** true if Family creation using the specified record Types is supported, false otherwise

Return type boolean

Raise NullArgument - family\_record\_types is null

compliance: mandatory – This method must be implemented.

RelationshipManager.get\_family\_form\_for\_create (*family\_record\_types*) Gets the family form for creating new families.

A new form should be requested for each create transaction.

Parameters family\_record\_types (osid.type.Type[]) - array of family
record types

**Returns** the family form

Return type osid.relationship.FamilyForm

Raise NullArgument - family\_record\_types is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported – unable to get form for requested record types

compliance: mandatory – This method must be implemented.

RelationshipManager.create\_family(family\_form)

Creates a new Family.

Parameters family\_form (osid.relationship.FamilyForm) - the form for this Family.

Returns the new Family

Return type osid.relationship.Family

Raise IllegalState - family\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

**Raise** NullArgument - family\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

**Raise** Unsupported – family\_form did not originate from get family form for create()

compliance: mandatory – This method must be implemented.

# RelationshipManager.can\_update\_families()

Tests if this user can update families.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating a Family will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer update operations to unauthorized users.

**Returns** false if Family modification is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

RelationshipManager.get\_family\_form\_for\_update (*family\_id*) Gets the family form for updating an existing family.

A new family form should be requested for each update transaction.

Parameters family\_id (osid.id.Id) - the Id of the Family

**Returns** the family form

Return type osid.relationship.FamilyForm

**Raise** NotFound – family\_id is not found

**Raise** NullArgument - family\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

RelationshipManager.update\_family (family\_form) Updates an existing family. Parameters family\_form (osid.relationship.FamilyForm) - the form containing the elements to be updated

Raise IllegalState - family\_form already used in an update transaction

Raise InvalidArgument - the form contains an invalid value

Raise NullArgument - family\_id or family\_form is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

**Raise** Unsupported – family\_form did not originate from get\_family\_form\_for\_update()

compliance: mandatory – This method must be implemented.

RelationshipManager.can\_delete\_families()

Tests if this user can delete families.

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting a Family will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer delete operations to unauthorized users.

Returns false if Family deletion is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
RelationshipManager.delete_family(family_id)
```

Deletes a Family.

Parameters family\_id (osid.id.Id) - the Id of the Family to remove

**Raise** NotFound – family\_id not found

**Raise** NullArgument - family\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

RelationshipManager.can\_manage\_family\_aliases()

Tests if this user can manage Id aliases for families.

A return of true does not guarantee successful authorization. A return of false indicates that it is known changing an alias will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer alias operations to an unauthorized user.

Returns false if Family aliasing is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

RelationshipManager.alias\_family (family\_id, alias\_id)

Adds an Id to a Family for the purpose of creating compatibility.

The primary Id of the Family is determined by the provider. The new Id performs as an alias to the primary Id. If the alias is a pointer to another family, it is reassigned to the given family Id.

**Parameters** 

• family\_id (osid.id.Id) - the Id of a Family

alias\_id (osid.id.Id) - the alias Id
Raise AlreadyExists - alias\_id is already assigned
Raise NotFound - family\_id not found
Raise NullArgument - family\_id or alias\_id is null
Raise OperationFailed - unable to complete request
Raise PermissionDenied - authorization failure
compliance: mandatory - This method must be implemented.

# **Family Hierarchy Methods**

RelationshipManager.family\_hierarchy\_id Gets the hierarchy Id associated with this session.

Returns the hierarchy Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

RelationshipManager.family\_hierarchy Gets the hierarchy associated with this session.

Returns the hierarchy associated with this session

**Return type** osid.hierarchy.Hierarchy

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

RelationshipManager.can\_access\_family\_hierarchy()

Tests if this user can perform hierarchy queries.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an an application that may not offer hierarchy traversal operations to unauthorized users.

Returns false if hierarchy traversal methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

RelationshipManager.use\_comparative\_family\_view()

The returns from the family methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

RelationshipManager.use\_plenary\_family\_view()

A complete view of the Family returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

RelationshipManager.root\_family\_ids Gets the root family Ids in this hierarchy.

Returns the root family Ids

Return type osid.id.IdList

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# RelationshipManager.root\_families

Gets the root families in the family hierarchy.

A node with no parents is an orphan. While all family Ids are known to the hierarchy, an orphan does not appear in the hierarchy unless explicitly added as a root node or child of another node.

**Returns** the root families

Return type osid.relationship.FamilyList

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method is must be implemented.

# RelationshipManager.has\_parent\_families (*family\_id*) Tests if the Family has any parents.

rests if the Family has any parents.

Parameters family\_id (osid.id.Id) - the Id of a family

**Returns** true if the family has parents, false otherwise

Return type boolean

Raise NotFound - family\_id is not found

**Raise** NullArgument - family\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

RelationshipManager.**is\_parent\_of\_family** (*id\_, family\_id*) Tests if an Id is a direct parent of a family.

#### **Parameters**

- id (osid.id.Id) an Id
- family\_id (osid.id.Id) the Id of a family

**Returns** true if this id is a parent of family\_id, false otherwise

Return type boolean

Raise NotFound - family\_id is not found

Raise NullArgument - id or family\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented. implementation notes*: If id not found return false.

RelationshipManager.get\_parent\_family\_ids (*family\_id*) Gets the parent Ids of the given family.

Parameters family\_id (osid.id.Id) - the Id of a family

Returns the parent Ids of the family

Return type osid.id.IdList

Raise NotFound - family\_id is not found

Raise NullArgument - family\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

RelationshipManager.get\_parent\_families (*family\_id*) Gets the parent families of the given id.

Parameters family\_id (osid.id.Id) - the Id of the Family to query

Returns the parent families of the id

Return type osid.relationship.FamilyList

Raise NotFound - a Family identified by Id is not found

**Raise** NullArgument - family\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

```
RelationshipManager.is_ancestor_of_family(id_,family_id)
Tests if an Id is an ancestor of a family.
```

#### **Parameters**

- id (osid.id.Id) an Id
- family\_id (osid.id.Id) the Id of a family

**Returns** true if this id is an ancestor of family\_id, false otherwise

Return type boolean

**Raise** NotFound – family\_id is not found

**Raise** NullArgument - id or family\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

*compliance: mandatory – This method must be implemented. implementation notes:* If id not found return false.

RelationshipManager.has\_child\_families (family\_id) Tests if a family has any children.

**Parameters family\_id** (osid.id.Id) - the Id of a family

**Returns** true if the family\_id has children, false otherwise

Return type boolean

Raise NotFound - family\_id is not found

Raise NullArgument - family\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

RelationshipManager.**is\_child\_of\_family**(*id\_, family\_id*) Tests if a family is a direct child of another.

#### **Parameters**

- id (osid.id.Id) an Id
- family\_id (osid.id.Id) the Id of a family

Returns true if the id is a child of family\_id, false otherwise

Return type boolean

Raise NotFound - family\_id is not found

**Raise** NullArgument - id or family\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented. implementation notes*: If id not found return false.

RelationshipManager.get\_child\_family\_ids (*family\_id*) Gets the child Ids of the given family.

Parameters family\_id (osid.id.Id) - the Id to query

**Returns** the children of the family

Return type osid.id.IdList

**Raise** NotFound – family\_id is not found

Raise NullArgument - family\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

RelationshipManager.get\_child\_families (family\_id) Gets the child families of the given id.

Parameters family\_id (osid.id.Id) - the Id of the Family to query

Returns the child families of the id

Return type osid.relationship.FamilyList

Raise NotFound - a Family identified by Id is not found

**Raise** NullArgument - family\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

RelationshipManager.is\_descendant\_of\_family(id\_, family\_id)

Tests if an Id is a descendant of a family.

# Parameters

- id (osid.id.Id) an Id
- family\_id (osid.id.Id) the Id of a family

**Returns** true if the id is a descendant of the family\_id, false otherwise

Return type boolean

Raise NotFound - family\_id is not found

**Raise** NullArgument - id or family\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented. implementation notes*: If id is not found return false.

RelationshipManager.get\_family\_node\_ids (family\_id, ancestor\_levels, descen-

*dant\_levels*, *include\_siblings*)

Gets a portion of the hierarchy for the given family.

### **Parameters**

- family\_id (osid.id.Id) the Id to query
- **ancestor\_levels** (cardinal) the maximum number of ancestor levels to include. A value of 0 returns no parents in the node.
- **descendant\_levels** (cardinal) the maximum number of descendant levels to include. A value of 0 returns no children in the node.
- include\_siblings (boolean) true to include the siblings of the given node, false to omit the siblings

### **Returns** a family node

Return type osid.hierarchy.Node

Raise NotFound - family\_id is not found

Raise NullArgument - family\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

RelationshipManager.get\_family\_nodes (family\_id, ancestor\_levels, descen-

*dant\_levels*, *include\_siblings*) Gets a portion of the hierarchy for the given family.

#### iets a portion of the merarchy for the given fam

# **Parameters**

• family\_id (osid.id.Id) - the Id to query

- **ancestor\_levels** (cardinal) the maximum number of ancestor levels to include. A value of 0 returns no parents in the node.
- **descendant\_levels** (cardinal) the maximum number of descendant levels to include. A value of 0 returns no children in the node.
- **include\_siblings** (boolean) true to include the siblings of the given node, false to omit the siblings

**Returns** a family node

Return type osid.relationship.FamilyNode

Raise NotFound - family\_id is not found

**Raise** NullArgument - family\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# **Family Hierarchy Design Methods**

#### RelationshipManager.family\_hierarchy\_id

Gets the hierarchy Id associated with this session.

Returns the hierarchy Id associated with this session

Return type osid.id.Id

*compliance: mandatory – This method must be implemented.* 

### RelationshipManager.family\_hierarchy

Gets the hierarchy associated with this session.

Returns the hierarchy associated with this session

Return type osid.hierarchy.Hierarchy

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

```
RelationshipManager.can_modify_family_hierarchy()
Tests if this user can change the hierarchy.
```

A return of true does not guarantee successful authorization. A return of false indicates that it is known performing any update will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer these operations to an unauthorized user.

**Returns** false if changing this hierarchy is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

RelationshipManager.add\_root\_family(family\_id)

Adds a root family.

Parameters family\_id (osid.id.Id) - the Id of a family

**Raise** AlreadyExists - family\_id is already in hierarchy

**Raise** NotFound – family\_id not found

**Raise** NullArgument - family\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Parameters family\_id (osid.id.Id) - the Id of a family

**Raise** NotFound – family\_id not a root

**Raise** NullArgument - family\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

RelationshipManager.add\_child\_family (*family\_id*, *child\_id*) Adds a child to a family.

# **Parameters**

- family\_id (osid.id.Id) the Id of a family
- child\_id (osid.id.Id) the Id of the new child

Raise AlreadyExists - family\_id is already a parent of child\_id

Raise NotFound - family\_id or child\_id not found

**Raise** NullArgument - family\_id or child\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

RelationshipManager.remove\_child\_family (*family\_id*, *child\_id*) Removes a child from a family.

#### Parameters

- **family\_id** (osid.id.Id) the Id of a family
- child\_id (osid.id.Id) the Id of the new child

Raise NotFound - family\_id not a parent of child\_id

**Raise** NullArgument - family\_id or child\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

RelationshipManager.remove\_child\_families (*family\_id*) Removes all children from a family.

Parameters family\_id (osid.id.Id) - the Id of a family

**Raise** NotFound – family\_id not in hierarchy

**Raise** NullArgument - family\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# Family

### Family

Bases: dlkit.osid.objects.OsidCatalog, dlkit.osid.sessions.OsidSession

A Family represents a collection of relationships.

Like all OSID objects, a Family is identified by its Id and any persisted references should use the Id.

get\_family\_record (family\_record\_type)

Gets the famly record corresponding to the given Family record Type.

This method is used to retrieve an object implementing the requested record. The family\_record\_type may be the Type returned in get\_record\_types() or any of its parents in a Type hierarchy where has\_record\_type(family\_record\_type) is true.

**Parameters family\_record\_type** (osid.type.Type) - the type of family record to retrieve

**Returns** the family record

Return type osid.relationship.records.FamilyRecord

**Raise** NullArgument - family\_record\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

**Raise** Unsupported - has\_record\_type (family\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Relationship Lookup Methods**

```
Family.family_id
```

Gets the Familt Id associated with this session.

Returns the Family Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

Family.family

Gets the Family associated with this session.

**Returns** the family

Return type osid.relationship.Family

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Family.can\_lookup\_relationships()

Tests if this user can perform Relationship lookups.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may not offer lookup operations to unauthorized users.

Returns false if lookup methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# Family.use\_comparative\_relationship\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory - This method is must be implemented.

# Family.use\_plenary\_relationship\_view()

A complete view of the Relationship returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

## Family.use\_federated\_family\_view()

Federates the view for methods in this session.

A federated view will include relationships in families which are children of this family in the family hierarchy.

compliance: mandatory – This method is must be implemented.

# Family.use\_isolated\_family\_view()

Isolates the view for methods in this session.

An isolated view restricts retrievals to this family only.

compliance: mandatory - This method is must be implemented.

# Family.use\_effective\_relationship\_view()

Only relationships whose effective dates are current are returned by methods in this session.

compliance: mandatory – This method is must be implemented.

# Family.use\_any\_effective\_relationship\_view()

All relationships of any effective dates are returned by all methods in this session.

compliance: mandatory – This method is must be implemented.

### Family.get\_relationship(relationship\_id)

Gets the Relationship specified by its Id.

Parameters relationship\_id(osid.id.Id) - the Id of the Relationship to
 retrieve

Returns the returned Relationship

Return type osid.relationship.Relationship

Raise NotFound - no Relationship found with the given Id

Raise NullArgument - relationship\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

# Family.get\_relationships\_by\_ids(relationship\_ids)

Gets a RelationshipList corresponding to the given IdList.

Parameters relationship\_ids (osid.id.IdList) - the list of Ids to retrieve

**Returns the returned** Relationship list

Return type osid.relationship.RelationshipList

Raise NotFound - an Id was not found

Raise NullArgument - relationship\_ids is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

```
Family.get_relationships_by_genus_type (relationship_genus_type)
```

Gets a RelationshipList corresponding to the given relationship genus Type which does not include relationships of types derived from the specified Type.

Parameters relationship\_genus\_type (osid.type.Type) - a relationship
genus type

Returns the returned Relationship list

Return type osid.relationship.RelationshipList

Raise NullArgument - relationship\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

```
Family.get_relationships_by_parent_genus_type (relationship_genus_type)
Gets a RelationshipList corresponding to the given relationship genus Type and include any
additional relationships with genus types derived from the specified Type.
```

Parameters relationship\_genus\_type (osid.type.Type) - a relationship
genus type

Returns the returned Relationship list

Return type osid.relationship.RelationshipList

Raise NullArgument - relationship\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

Family.get\_relationships\_by\_record\_type (relationship\_record\_type)
Gets a RelationshipList containing the given relationship record Type.

**Parameters relationship\_record\_type** (osid.type.Type) - a relationship record type

Returns the returned RelationshipList

Return type osid.relationship.RelationshipList

Raise NullArgument - relationship\_record\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Family.get\_relationships\_on\_date(from\_, to)

Gets a RelationshipList effective during the entire given date range inclusive but not confined to the date range.

#### Parameters

- from (osid.calendaring.DateTime) starting date
- to (osid.calendaring.DateTime) ending date

**Returns** the relationships

Return type osid.relationship.RelationshipList

Raise InvalidArgument - from is greater than to

**Raise** NullArgument - from or to is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# Family.get\_relationships\_for\_source(source\_id)

Gets a RelationshipList corresponding to the given peer Id.

Parameters source\_id(osid.id.Id)-a peer Id

Returns the relationships

Return type osid.relationship.RelationshipList

Raise NullArgument - source\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

## Family.get\_relationships\_for\_source\_on\_date(source\_id, from\_, to)

Gets a RelationshipList corresponding to the given peer Id and effective during the entire given date range inclusive but not confined to the date range.

### Parameters

- source\_id (osid.id.Id) a peer Id
- from (osid.calendaring.DateTime) starting date

• to (osid.calendaring.DateTime) - ending date

**Returns** the relationships

Return type osid.relationship.RelationshipList

Raise InvalidArgument - from is greater than to

Raise NullArgument - source\_id, from, or to is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

Family.get\_relationships\_by\_genus\_type\_for\_source(source\_id, relation-

ship\_genus\_type)

Gets a RelationshipList corresponding to the given peer Id and relationship genus "Type.

Relationships" of any genus derived from the given genus are returned.

In plenary mode, the returned list contains all of the relationships corresponding to the given peer, including duplicates, or an error results if a relationship is inaccessible. Otherwise, inaccessible Relationships may be omitted from the list and may present the elements in any order including returning a unique set.

In effective mode, relationships are returned that are currently effective. In any effective mode, effective relationships and those currently expired are returned.

#### Parameters

- source\_id (osid.id.Id) a peer Id
- relationship\_genus\_type (osid.type.Type) a relationship genus type

**Returns** the relationships

Return type osid.relationship.RelationshipList

Raise NullArgument - source\_id or relationship\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Family.get\_relationships\_by\_genus\_type\_for\_source\_on\_date (source\_id,

relation-

ship\_genus\_type,

from\_, to)

Gets a RelationshipList corresponding to the given peer Id and relationship genus Type and effective during the entire given date range inclusive but not confined to the date range.

# Parameters

- source\_id (osid.id.Id) a peer Id
- relationship\_genus\_type (osid.type.Type) a relationship genus type
- from (osid.calendaring.DateTime) starting date
- to (osid.calendaring.DateTime) ending date

**Returns** the relationships

Return type osid.relationship.RelationshipList

Raise InvalidArgument - from is greater than to

Raise NullArgument-source\_id, relationship\_genus\_type, from or to is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Family.get\_relationships\_for\_destination (destination\_id)
Gets a RelationshipList corresponding to the given peer Id.

Parameters destination\_id (osid.id.Id) - a peer Id

Returns the relationships

Return type osid.relationship.RelationshipList

**Raise** NullArgument - destination\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Family.get\_relationships\_for\_destination\_on\_date(destination\_id, from\_, to)
Gets a RelationshipList corresponding to the given peer Id with a starting effective date in
the given range inclusive.

# Parameters

- destination\_id (osid.id.Id) a peer Id
- from (osid.calendaring.DateTime) starting date
- to (osid.calendaring.DateTime) ending date

**Returns** the relationships

Return type osid.relationship.RelationshipList

Raise InvalidArgument - from is greater than to

Raise NullArgument - destination\_id, from, or to is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Family.get\_relationships\_by\_genus\_type\_for\_destination (destination\_id,

relation-

ship\_genus\_type)

Gets a RelationshipList corresponding to the given peer Id and relationship genus "Type.

Relationships" of any genus derived from the given genus are returned.

In plenary mode, the returned list contains all of the relationships corresponding to the given peer, including duplicates, or an error results if a relationship is inaccessible. Otherwise, inaccessible Relationships may be omitted from the list and may present the elements in any order including returning a unique set.

In effective mode, relationships are returned that are currently effective. In any effective mode, effective relationships and those currently expired are returned.

### Parameters

- destination\_id (osid.id.Id) a peer Id
- relationship\_genus\_type (osid.type.Type) a relationship genus type

**Returns** the relationships

Return type osid.relationship.RelationshipList

Raise NullArgument - destination\_id or relationship\_genus\_type is
 null

Raise OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Family.get\_relationships\_by\_genus\_type\_for\_destination\_on\_date(destination\_id,

relationship\_genus\_type, from\_, to)

Gets a RelationshipList corresponding to the given peer Id and relationship genus Type and effective during the entire given date range inclusive but not confined to the date range.

#### **Parameters**

- destination\_id (osid.id.Id) a peer Id
- relationship\_genus\_type (osid.type.Type) a relationship genus type
- from (osid.calendaring.DateTime) starting date
- to (osid.calendaring.DateTime) ending date

# **Returns** the relationships

Return type osid.relationship.RelationshipList

Raise InvalidArgument - from is greater than to

Raise NullArgument - destination\_id, relationship\_genus\_type,
from or to is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Family.get\_relationships\_for\_peers (source\_id, destination\_id)
Gets a RelationshipList corresponding to the given peer Ids.

#### **Parameters**

- source\_id (osid.id.Id) a peer Id
- destination\_id (osid.id.Id) a related peer Id

**Returns** the relationships

Return type osid.relationship.RelationshipList

**Raise** NullArgument - source\_id or destination\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Family.get\_relationships\_for\_peers\_on\_date(source\_id, destination\_id, from\_,

*to*) Gets a RelationshipList corresponding to the given peer Ids and effective during the entire given date range inclusive but not confined to the date range.

# **Parameters**

- source\_id (osid.id.Id) a peer Id
- destination\_id (osid.id.Id) a related peer Id
- from (osid.calendaring.DateTime) starting date
- to (osid.calendaring.DateTime) ending date

**Returns** the relationships

Return type osid.relationship.RelationshipList

Raise InvalidArgument - from is greater than to

Raise NullArgument-source\_id, destination\_id, from or to is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Family.get_relationships_by_genus_type_for_peers	(source_id,	destina-	
	tion_id,	relation-	
	ship_genus_typ		
Cots a Dolotion shint is at corresponding between the given	noor I do and rol	ationship gan	

Gets a RelationshipList corresponding between the given peer Ids and relationship genus "Type.

Relationships" of any genus derived from the given genus are returned.

In plenary mode, the returned list contains all of the relationships corresponding to the given peer or an error results if a relationship is inaccessible. Otherwise, inaccessible Relationships may be omitted from the list.

In effective mode, relationships are returned that are currently effective. In any effective mode, effective relationships and those currently expired are returned.

#### Parameters

- source\_id (osid.id.Id) a peer Id
- destination\_id (osid.id.Id) a related peer Id
- relationship\_genus\_type (osid.type.Type) a relationship genus type

Returns the relationships

Return type osid.relationship.RelationshipList

or

Raise NullArgument - source\_id, destination\_id, relationship\_genus\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Family.get\_relationships\_by\_genus\_type\_for\_peers\_on\_date(source\_id,

destination\_id, relationship\_genus\_type, from , to)

Gets a RelationshipList effective during the entire given date range inclusive but not confined to the date range.

## **Parameters**

- source\_id (osid.id.Id) a peer Id
- destination\_id (osid.id.Id) a related peer Id
- relationship\_genus\_type (osid.type.Type) a relationship genus type
- from (osid.calendaring.DateTime) starting date
- to (osid.calendaring.DateTime) ending date

#### **Returns** the relationships

Return type osid.relationship.RelationshipList

Raise InvalidArgument - from is greater than to

Raise NullArgument - source\_id, destination\_id, relationship\_genus\_type, from or to is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Family.relationships

Gets all Relationships.

**Returns** a list of Relationships

Return type osid.relationship.RelationshipList

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### **Relationship Query Methods**

```
Family.family_id
```

Gets the Familt Id associated with this session.

Returns the Family Id associated with this session

## Return type osid.id.Id

compliance: mandatory – This method must be implemented.

## Family.family

Gets the Family associated with this session.

**Returns** the family

Return type osid.relationship.Family

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

# Family.use\_federated\_family\_view()

Federates the view for methods in this session.

A federated view will include relationships in families which are children of this family in the family hierarchy.

compliance: mandatory – This method is must be implemented.

# Family.use\_isolated\_family\_view()

Isolates the view for methods in this session.

An isolated view restricts retrievals to this family only.

compliance: mandatory - This method is must be implemented.

# Family.can\_search\_relationships()

Tests if this user can perform Relationship searches.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer search operations to unauthorized users.

**Returns** false if search methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### Family.relationship\_query

Gets a relationship query.

Returns the relationship query

Return type osid.relationship.RelationshipQuery

compliance: mandatory – This method must be implemented.

# Family.get\_relationships\_by\_query (*relationship\_query*) Gets a list of Relationships matching the given relationship query.

RelationshipQuery) - the relationship query

Parameters relationship\_query

(osid.relationship.

Returns the returned RelationshipList

Return type osid.relationship.RelationshipList

Raise NullArgument - relationship\_query is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

**Raise** Unsupported – relationship\_query is not of this service

compliance: mandatory – This method must be implemented.

# **Relationship Admin Methods**

## Family.family\_id

Gets the Familt Id associated with this session.

Returns the Family Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

### Family.family

Gets the Family associated with this session.

**Returns** the family

Return type osid.relationship.Family

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Family.can\_create\_relationships()

Tests if this user can create Relationships A return of true does not guarantee successful authorization.

A return of false indicates that it is known creating a Relationship will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer create operations to an unauthorized user.

Returns false if Relationship creation is not authorized, true otherwise

**Return type** boolean

compliance: mandatory – This method must be implemented.

Family.can\_create\_relationship\_with\_record\_types (*relationship\_record\_types*) Tests if this user can create a single Relationship using the desired record types.

While RelationshipManager.getRelationshipRecordTypes() can be used to examine which records are supported, this method tests which record(s) are required for creating a specific Relationship. Providing an empty array tests if a Relationship can be created with no records.

**Parameters relationship\_record\_types** (osid.type.Type[]) - array of relationship record types

**Returns** true if Relationship creation using the specified record Types is supported, false otherwise

Return type boolean

**Raise** NullArgument - relationship\_record\_types is null

```
Family.get_relationship_form_for_create(source_id, destination_id, relation-
ship_record_types)
```

Gets the relationship form for creating new relationships.

A new form should be requested for each create transaction.

#### **Parameters**

- source\_id (osid.id.Id) Id of a peer
- destination\_id (osid.id.Id) Id of the related peer
- **relationship\_record\_types** (osid.type.Type[]) array of relationship record types

# Returns the relationship form

Return type osid.relationship.RelationshipForm

Raise NotFound - source\_id or destination\_id is not found

Raise NullArgument - source\_id or destination\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

Raise Unsupported – unable to get form for requested recod types

compliance: mandatory - This method must be implemented.

# Family.create\_relationship(relationship\_form)

Creates a new Relationship.

## Parameters relationship\_form

RelationshipForm) - the form for this Relationship

Returns the new Relationship

Return type osid.relationship.Relationship

Raise IllegalState - relationship\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

Raise NullArgument - relationship\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported - relationship\_form did not originate from
 get\_relationship\_form\_for\_create()

compliance: mandatory – This method must be implemented.

# Family.can\_update\_relationships()

Tests if this user can update Relationships.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating a Relationship will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer update operations to an unauthorized user.

Returns false if Relationship modification is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

(osid.relationship.

Family.get\_relationship\_form\_for\_update (*relationship\_id*) Gets the relationship form for updating an existing relationship.

A new relationship form should be requested for each update transaction.

Parameters relationship\_id (osid.id.Id) - the Id of the Relationship

**Returns** the relationship form

Return type osid.relationship.RelationshipForm

Raise NotFound - relationship\_id is not found

Raise NullArgument - relationship\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Family.update\_relationship(relationship\_form)

Updates an existing relationship.

#### Parameters relationship\_form

(osid.relationship.

RelationshipForm) – the form containing the elements to be updated

Raise IllegalState - relationship\_form already used in an update transaction

**Raise** InvalidArgument – the form contains an invalid value

**Raise** NullArgument - relationship\_form is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

**Raise** Unsupported - relationship\_form did not originate from get\_relationship\_form\_for\_update()

*compliance: mandatory – This method must be implemented.* 

## Family.can\_delete\_relationships()

Tests if this user can delete Relationships.

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting a Relationship will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer delete operations to an unauthorized user.

Returns false if Relationship deletion is not authorized, true otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

Family.delete\_relationship(relationship\_id)

Deletes a Relationship.

Parameters relationship\_id (osid.id.Id) - the Id of the Relationship to
 remove

Raise NotFound - relationship\_id not found

Raise NullArgument - relationship\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Family.can\_manage\_relationship\_aliases()

Tests if this user can manage Id aliases for Relationships.

A return of true does not guarantee successful authorization. A return of false indicates that it is known changing an alias will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer alias operations to an unauthorized user.

Returns false if Relationship aliasing is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
Family.alias_relationship(relationship_id, alias_id)
```

Adds an Id to a Relationship for the purpose of creating compatibility.

The primary Id of the Relationship is determined by the provider. The new Id performs as an alias to the primary Id. If the alias is a pointer to another relationship, it is reassigned to the given relationship Id.

#### **Parameters**

- relationship\_id (osid.id.Id) the Id of a Relationship
- alias\_id (osid.id.Id) the alias Id

Raise AlreadyExists - alias\_id is already assigned

Raise NotFound - relationship not found

Raise NullArgument - relationship\_id or alias\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## **Objects**

## Relationship

```
class dlkit.relationship.objects.Relationship
```

 $Bases: \ \texttt{dlkit.osid.objects.OsidRelationship}$ 

A Relationship is an object between two peers.

The genus type indicates the relationship between the peer and the related peer.

## source\_id

Gets the from peer Id in this relationship.

Returns the peer

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

## destination\_id

Gets the to peer Id in this relationship.

**Returns** the related peer

**Return type** osid.id.Id

compliance: mandatory – This method must be implemented.

#### get\_relationship\_record (relationship\_record\_type)

Gets the relationshop record corresponding to the given Relationship record Type.

This method is used to retrieve an object implementing the requested record. The relationship\_record\_type may be the Type returned in get\_record\_types() or any of its parents in a Type hierarchy where has\_record\_type (relationship\_record\_type) is true

**Parameters relationship\_record\_type** (osid.type.Type) - the type of relationship record to retrieve

**Returns** the relationship record

Return type osid.relationship.records.RelationshipRecord

**Raise** NullArgument - relationship\_record\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

```
Raise Unsupported - has_record_type(relationship_record_type) is
false
```

compliance: mandatory – This method must be implemented.

### **Relationship Form**

```
class dlkit.relationship.objects.RelationshipForm
```

Bases: dlkit.osid.objects.OsidRelationshipForm

This is the form for creating and updating Relationships.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the RelationshipAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

get\_relationship\_form\_record (relationship\_record\_type)

Gets the RelationshipFormRecord corresponding to the given relationship record Type.

Parameters relationship\_record\_type (osid.type.Type) - a relationship record
type

Returns the relationship form record

Return type osid.relationship.records.RelationshipFormRecord

Raise NullArgument - relationship\_record\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

Raise Unsupported - has\_record\_type(relationship\_record\_type) is
false

compliance: mandatory – This method must be implemented.

## **Relationship List**

```
class dlkit.relationship.objects.RelationshipList
    Bases: dlkit.osid.objects.OsidList
```

Like all OsidLists, Relationship provides a means for accessing Relationship elements sequentially either one at a time or many at a time.

Examples: while (rl.hasNext()) { Relationship relationship = rl.getNextRelationship(); }

## or

while (rl.hasNext()) { Relationship[] relationships = rl.getNextRelationships(rl.available());

#### }

#### next\_relationship

Gets the next Relationship in this list.

**Returns** the next Relationship in this list. The has\_next() method should be used to test that a next Relationship is available before calling this method.

Return type osid.relationship.Relationship

Raise IllegalState - no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

#### get\_next\_relationships(n)

Gets the next set of Relationships elements in this list.

The specified amount must be less than or equal to the return from available ().

- Parameters n (cardinal) the number of Relationship elements requested which must be less than or equal to available ()
- **Returns** an array of Relationship elements. The length of the array is less than or equal to the number specified.

Return type osid.relationship.Relationship

Raise IllegalState - no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

## Family

## :noindex:

#### get\_family\_record (family\_record\_type)

Gets the famly record corresponding to the given Family record Type.

This method is used to retrieve an object implementing the requested record. The family\_record\_type may be the Type returned in get\_record\_types() or any of its parents in a Type hierarchy where has\_record\_type(family\_record\_type) is true.

**Parameters family\_record\_type** (osid.type.Type) - the type of family record to retrieve

Returns the family record

Return type osid.relationship.records.FamilyRecord

**Raise** NullArgument - family\_record\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

Raise Unsupported - has\_record\_type (family\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Family Form**

```
class dlkit.relationship.objects.FamilyForm
    Bases: dlkit.osid.objects.OsidCatalogForm
```

This is the form for creating and updating Family objects.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the FamilyAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

```
get_family_form_record (family_record_type)
```

Gets the FamilyFormRecord corresponding to the given family record Type.

**Parameters family\_record\_type** (osid.type.Type) - the family record type

**Returns** the family form record

Return type osid.relationship.records.FamilyFormRecord

**Raise** NullArgument – family\_record\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

Raise Unsupported - has\_record\_type (family\_record\_type) is false

compliance: mandatory – This method must be implemented.

#### **Family List**

class dlkit.relationship.objects.FamilyList

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, FamilyList provides a means for accessing Family elements sequentially either one at a time or many at a time.

Examples: while (fl.hasNext()) { Family family = fl.getNextFamily(); }

or

while (fl.hasNext()) { Family[] families = fl.getNextFamilies(fl.available());

}

```
next_family
```

Gets the next Family in this list.

**Returns** the next Family in this list. The has\_next() method should be used to test that a next Family is available before calling this method.

Return type osid.relationship.Family

Raise IllegalState - no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

#### get\_next\_families(n)

Gets the next set of Family elements in this list.

The specified amount must be less than or equal to the return from available ().

- Parameters n (cardinal) the number of Family elements requested which must be less
  than or equal to available ()
- **Returns** an array of Family elements. The length of the array is less than or equal to the number specified.

Return type osid.relationship.Family

**Raise** IllegalState – no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

## **Family Node**

class dlkit.relationship.objects.FamilyNode

Bases: dlkit.osid.objects.OsidNode

This interface is a container for a partial hierarchy retrieval.

The number of hierarchy levels traversable through this interface depend on the number of levels requested in the FamilyHierarchySession.

#### family

Gets the Family at this node.

**Returns** the family represented by this node

Return type osid.relationship.Family

compliance: mandatory – This method must be implemented.

## parent\_family\_nodes

Gets the parents of this family.

Returns the parents of the id

Return type osid.relationship.FamilyNodeList

compliance: mandatory – This method must be implemented.

## child\_family\_nodes

Gets the children of this family.

**Returns** the children of this family

Return type osid.relationship.FamilyNodeList

compliance: mandatory - This method must be implemented.

## **Family Node List**

```
class dlkit.relationship.objects.FamilyNodeList
```

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, FamilyNodeList provides a means for accessing FamilyNode elements sequentially either one at a time or many at a time.

Examples: while (fnl.hasNext()) { FamilyNode node = fnl.getNextFamilyNode(); }

## or

while (fnl.hasNext()) { FamilyNode[] nodes = fnl.getNextFamilyNodes(fnl.available());

#### }

#### next\_family\_node

Gets the next FamilyNode in this list.

**Returns** the next FamilyNode in this list. The has\_next() method should be used to test that a next FamilyNode is available before calling this method.

Return type osid.relationship.FamilyNode

Raise IllegalState - no more elements available in this list

**Raise** OperationFailed - unable to complete request

compliance: mandatory - This method must be implemented.

#### get\_next\_family\_nodes(n)

Gets the next set of FamilyNode elements in this list.

The specified amount must be less than or equal to the return from available ().

- **Parameters n** (cardinal) the number of FamilyNode elements requested which must be less than or equal to available()
- **Returns** an array of FamilyNode elements. The length of the array is less than or equal to the number specified.

Return type osid.relationship.FamilyNode

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

## Queries

## **Relationship Query**

class dlkit.relationship.queries.RelationshipQuery

Bases: dlkit.osid.queries.OsidRelationshipQuery

This is the query for searching relationships.

Each method match specifies an AND term while multiple invocations of the same method produce a nested OR.

**match\_source\_id** (*peer*, *match*) Matches a relationship peer.

Parameters

- peer (osid.id.Id) peer Id to match
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - peer is null

compliance: mandatory – This method must be implemented.

#### source\_id\_terms

match\_destination\_id (peer, match)

Matches the other relationship peer.

Parameters

- peer (osid.id.Id) peer Id to match
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - peer is null

compliance: mandatory – This method must be implemented.

#### destination\_id\_terms

#### match\_same\_peer\_id(match)

Matches circular relationships to the same peer.

Parameters match (boolean) - true for a positive match, false for a negative match

compliance: mandatory – This method must be implemented.

#### same\_peer\_id\_terms

## match\_family\_id (family\_id, match)

Sets the family Id for this query.

#### **Parameters**

- family\_id (osid.id.Id) a family Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - family\_id is null

compliance: mandatory – This method must be implemented.

#### family\_id\_terms

#### supports\_family\_query()

Tests if a FamilyQuery is available.

**Returns** true if a family query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### family\_query

Gets the query for a family.

Multiple retrievals produce a nested OR term.

**Returns** the family query

Return type osid.relationship.FamilyQuery

Raise Unimplemented - supports\_family\_query() is false

compliance: optional – This method must be implemented if "supports\_family\_query()" is "true".

#### family\_terms

```
get_relationship_query_record(relationship_record_type)
```

Gets the relationship query record corresponding to the given Relationship record Type.

Multiple record retrievals produce a nested OR term.

Parameters relationship\_record\_type (osid.type.Type) - a relationship record
type

Returns the relationship query record

Return type osid.relationship.records.RelationshipQueryRecord

Raise NullArgument - relationship\_record\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure occurred

Raise Unsupported - has\_record\_type(relationship\_record\_type) is
false

compliance: mandatory – This method must be implemented.

## **Family Query**

```
class dlkit.relationship.queries.FamilyQuery
```

Bases: dlkit.osid.queries.OsidCatalogQuery

This is the query interface for searching for families.

Each method specifies an AND term while multiple invocations of the same method produce a nested OR.

match\_relationship\_id (relationship\_id, match)
Matches a relationship Id.

Parameters

- relationship\_id (osid.id.Id) a relationship Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - relationship\_id is null

compliance: mandatory – This method must be implemented.

#### relationship\_id\_terms

```
supports_relationship_query()
```

Tests if a relationship query is available.

Returns true if a relationship query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## relationship\_query

Gets the query interface for a relationship.

**Returns** the relationship query

Return type osid.relationship.RelationshipQuery

Raise Unimplemented - supports\_relationship\_query() is false

compliance: optional – This method must be implemented if "supports\_relationship\_query()" is "true".

#### match\_any\_relationship(match)

Matches families with any relationship.

**Parameters match** (boolean) – true to match families with any relationship, false to match families with no relationship

compliance: mandatory – This method must be implemented.

### relationship\_terms

match\_ancestor\_family\_id(family\_id, match)

Sets the family Id for this query to match families that have the specified family as an ancestor.

**Parameters** 

- family\_id (osid.id.Id) a family Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - family\_id is null

compliance: mandatory – This method must be implemented.

## ancestor\_family\_id\_terms

```
supports_ancestor_family_query()
```

Tests if a FamilyQuery is available.

**Returns** true if a family query interface is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### ancestor\_family\_query

Gets the query interface for a family.

Multiple retrievals produce a nested OR term.

**Returns** the family query

Return type osid.relationship.FamilyQuery

Raise Unimplemented - supports\_ancestor\_family\_query() is false

compliance: optional – This method must be implemented if ''supports\_ancestor\_family\_query()'' is ''true''.

## match\_any\_ancestor\_family(match)

Matches families with any ancestor.

**Parameters match** (boolean) – true to match families with any ancestor, false to match root families

compliance: mandatory – This method must be implemented.

#### ancestor\_family\_terms

match\_descendant\_family\_id (family\_id, match)

Sets the family Id for this query to match families that have the specified family as a descednant.

## Parameters

- family\_id (osid.id.Id) a family Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument – family\_id is null

compliance: mandatory – This method must be implemented.

## descendant\_family\_id\_terms

supports\_descendant\_family\_query()

Tests if a FamilyQuery is available.

**Returns** true if a family query interface is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### descendant\_family\_query

Gets the query interface for a family.

Multiple retrievals produce a nested OR term.

Returns the family query

Return type osid.relationship.FamilyQuery

Raise Unimplemented - supports\_descendant\_family\_query() is false

compliance: optional – This method must be implemented if ''supports\_descendant\_family\_query()'' is ''true''.

#### match\_any\_descendant\_family(match)

Matches families with any decendant.

**Parameters match** (boolean) – true to match families with any decendants, false to match leaf families

compliance: mandatory – This method must be implemented.

#### descendant\_family\_terms

#### get\_family\_query\_record (family\_record\_type)

Gets the family query record corresponding to the given Family record Type.

Multiple record retrievals produce a nested boolean OR term.

```
Parameters family_record_type (osid.type.Type) – a family record type
```

**Returns** the family query record

Return type osid.relationship.records.FamilyQueryRecord

**Raise** NullArgument - family\_record\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure occurred

**Raise** Unsupported - has\_record\_type (family\_record\_type) is false

compliance: mandatory – This method must be implemented.

## Records

### **Relationship Record**

```
class dlkit.relationship.records.RelationshipRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for a Relationship.

The methods specified by the record type are available through the underlying object.

## **Relationship Query Record**

class dlkit.relationship.records.RelationshipQueryRecord Bases: dlkit.osid.records.OsidRecord

A record for a RelationshipQuery.

The methods specified by the record type are available through the underlying object.

## **Relationship Form Record**

class dlkit.relationship.records.RelationshipFormRecord Bases: dlkit.osid.records.OsidRecord

A record for a RelationshipForm.

The methods specified by the record type are available through the underlying object.

## **Relationship Search Record**

class dlkit.relationship.records.RelationshipSearchRecord Bases: dlkit.osid.records.OsidRecord

A record for a RelationshipSearch.

The methods specified by the record type are available through the underlying object.

## **Family Record**

```
class dlkit.relationship.records.FamilyRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for a Family.

The methods specified by the record type are available through the underlying object.

## **Family Query Record**

```
class dlkit.relationship.records.FamilyQueryRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for a FamilyQuery.

The methods specified by the record type are available through the underlying object.

## **Family Form Record**

```
class dlkit.relationship.records.FamilyFormRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for a FamilyForm.

The methods specified by the record type are available through the underlying object.

## **Family Search Record**

class dlkit.relationship.records.FamilySearchRecord Bases: dlkit.osid.records.OsidRecord

A record for a FamilySearch.

The methods specified by the record type are available through the underlying object.

# Repository

## Summary

Repository Open Service Interface Definitions repository version 3.0.0

The Repository OSID provides the service of finding and managing digital assets.

Assets

An Asset represents a unit of content, whether it be an image, a video, an application document or some text. The Asset defines a core set of definitions applicable to digital content, such as copyright and publisher, and allows for a type specification to be appended as with other OsidObjects.

Asset content, such as a document, is defined such that there may be multiple formats contained with the same asset. A document may be accessible in both PDF and MS Word, but is the same document, for example. An image may have both a large size and a thumbnail version. Generally, an asset contains more than one version of content when it is left to the application to decide which is most appropriate.

The Asset Type may define methods in common throughout the content variations. An example asset is one whose content Types are "Quicktime" and "MPEG", but the Asset Type is "movie" and defines methods that describe the move aside from the formats. This "double" Type hierarchy stemming from the asset requires more care in defining interfaces.

Assets also have "credits" which define the authors, editors, creators, performers, producers or any other "role", identified with a role Type, with the production of the asset. These are managed externally to the asset through another OsidSession.

Through additional OsidSessions, the Asset can be "extended" to offer temporal information. An asset may pertain to a date, a period of time, or a series of dates and periods. This mechanism is to offer the ability to search for assets pertaining to a desired date range without requiring understanding of a Type.

Similarly, the Asset can also map to spatial information. A photograph may be "geotagged" with the GPS coordinates where it was taken, a conical shape in stellar coordinates could be described for an astronimocal image, or there may be a desire to may a historical book to the spatial coordinates of Boston and Philadelphia. Unlike temporal mappings, the definition of the spatial coordinate is left to a spatial Type to define. The Repository OSID simply manages spatial mappings to the Asset.

## Asset Tagging

Assets may also relate to Ontology OSID Subjects. The Subject provides the ability to normalize information related to subject matter across the Assets to simplify management and provide a more robust searching mechanism. For example, with a photograph of the Empire State Building, one may wish to describe that it was designed by Shreve, Lamb and Harmon and completed in 1931. The information about the building itself can be described using a Subject and related to the photograph, and any other photograph that captures the building. The Asset Type for

the photograph may simply be "photograph" and doesn't attempt to describe a building, while the AssetContent Type is "image/jpeg".

An application performing a search for Empire State Building can be execute the search over the Subjects, and once the user has narrowed the subject area, then the related Assets can be retrieved, and from there negotiate the content.

A provider wishing to construct a simple inventory database of buildings in New York may decide to do so using the Resource OSID. The Resource Type may describe the construction dates, height, location, style and architects of buildings. The Type may also include a means of getting a reference image using the Asset interface. Since there is no explicit relationship between Subject and Resource, the Resource can be adapted to the Subject interface (mapping a building\_resource\_type to a building\_subject\_type ) to use the same data for Subject to Asset mappings and searching.

## Asset Compositions

Asset compositions can be created using the Composition interface. A Composition is a group of Assets and compositions may be structured into a hierarchy for the purpose of "building" larger content. A content management system may make use of this interface to construct a web page. The Composition hierarchy may map into an XHTML structure and each Asset represent an image or a link in the document. However, the produced web page at a given URL may be represented by another single Asset that whose content has both the URL and the XHTML stream.

Another example is an IMS Common Cartridge. The Composition may be used to produce the zip file cartridge, but consumers may access the zip file via an Asset.

## **Repository Cataloging**

Finally, Assets and Compositions may be categorized into Repository objects. A Repository is a catalog-like interface to help organize assets and subject matter. Repositories may be organized into hierarchies for organization or federation purposes.

This number of service aspects to this Repository OSID produce a large number of definitions. It is recommended to use the RepositoryManager definition to select a single OsidSession of interest, and work that definition through its dependencies before tackling another aspect.

## Sub Packages

The Repository OSID includes a rules subpackage for managing dynamic compositions. Repository Open Service Interface Definitions repository version 3.0.0

The Repository OSID provides the service of finding and managing digital assets.

## Assets

An Asset represents a unit of content, whether it be an image, a video, an application document or some text. The Asset defines a core set of definitions applicable to digital content, such as copyright and publisher, and allows for a type specification to be appended as with other OsidObjects.

Asset content, such as a document, is defined such that there may be multiple formats contained with the same asset. A document may be accessible in both PDF and MS Word, but is the same document, for example. An image may have both a large size and a thumbnail version. Generally, an asset contains more than one version of content when it is left to the application to decide which is most appropriate.

The Asset Type may define methods in common throughout the content variations. An example asset is one whose content Types are "Quicktime" and "MPEG", but the Asset Type is "movie" and defines methods that describe the move aside from the formats. This "double" Type hierarchy stemming from the asset requires more care in defining interfaces.

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## Sub Packages

The Repository OSID includes a rules subpackage for managing dynamic compositions.

## **Service Managers**

## **Repository Profile**

```
class dlkit.services.repository.RepositoryProfile
Bases: dlkit.osid.managers.OsidProfile
```

The repository profile describes interoperability among repository services.

#### supports\_asset\_lookup()

Tests if asset lookup is supported.

Returns true if asset lookup is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_asset\_query()

Tests if asset query is supported.

Returns true if asset query is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## supports\_asset\_search()

Tests if asset search is supported.

**Returns** true if asset search is supported , false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_asset\_admin()

Tests if asset administration is supported.

**Returns** true if asset administration is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## supports\_asset\_notification()

Tests if asset notification is supported.

A repository may send messages when assets are created, modified, or deleted.

Returns true if asset notification is supported , false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## supports\_asset\_repository()

Tests if retrieving mappings of assets and repositories is supported.

**Returns** true if asset repository mapping retrieval is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## supports\_asset\_repository\_assignment()

Tests if managing mappings of assets and repositories is supported.

Returns true if asset repository assignment is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_asset\_composition()

Tests if assets are included in compositions.

**Returns** true if asset composition supported , false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## supports\_asset\_composition\_design()

Tests if mapping assets to compositions is supported.

**Returns** true if designing asset compositions is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_composition\_lookup()

Tests if composition lookup is supported.

Returns true if composition lookup is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_composition\_query()

Tests if composition query is supported.

Returns true if composition query is supported , false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_composition\_search()

Tests if composition search is supported.

Returns true if composition search is supported, false otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

## supports\_composition\_admin()

Tests if composition administration is supported.

**Returns** true if composition administration is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_composition\_repository()

Tests if retrieval of composition to repository mappings is supported.

Returns true if composition to repository mapping is supported , false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_composition\_repository\_assignment()

Tests if assigning composition to repository mappings is supported.

Returns true if composition to repository assignment is supported , false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## supports\_repository\_lookup()

Tests if repository lookup is supported.

**Returns** true if repository lookup is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## supports\_repository\_query()

Tests if repository query is supported.

Returns true if repository query is supported , false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_repository\_admin()

Tests if repository administration is supported.

Returns true if repository administration is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_repository\_hierarchy()

Tests if a repository hierarchy traversal is supported.

**Returns** true if a repository hierarchy traversal is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## supports\_repository\_hierarchy\_design()

Tests if a repository hierarchy design is supported.

Returns true if a repository hierarchy design is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### asset\_record\_types

Gets all the asset record types supported.

**Returns** the list of supported asset record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### asset\_search\_record\_types

Gets all the asset search record types supported.

Returns the list of supported asset search record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### asset\_content\_record\_types

Gets all the asset content record types supported.

Returns the list of supported asset content record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### composition\_record\_types

Gets all the composition record types supported.

**Returns** the list of supported composition record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### composition\_search\_record\_types

Gets all the composition search record types supported.

**Returns** the list of supported composition search record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

## repository\_record\_types

Gets all the repository record types supported.

**Returns** the list of supported repository record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### repository\_search\_record\_types

Gets all the repository search record types supported.

**Returns** the list of supported repository search record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### spatial\_unit\_record\_types

Gets all the spatial unit record types supported.

**Returns** the list of supported spatial unit record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### coordinate\_types

Gets all the coordinate types supported.

Returns the list of supported coordinate types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

## **Repository Manager**

class dlkit.services.repository.RepositoryManager(proxy=None)

**Bases:** dlkit.osid.managers.OsidManager, dlkit.osid.sessions.OsidSession, *dlkit.services.repository.RepositoryProfile* 

The repository manager provides access to asset lookup and creation session and provides interoperability tests for various aspects of this service.

The sessions included in this manager are:

•AssetLookupSession: a session to retrieve assets

•AssetQuerySession: a session to query assets

•AssetSearchSession: a session to search for assets

•AssetAdminSession: a session to create and delete assets

•AssetNotificationSession: a session to receive notifications pertaining to asset changes

•AssetRepositorySession: a session to look up asset to repository mappings

•AssetRepositoryAssignmentSession: a session to manage asset to repository mappings

•AssetSmartRepositorySession: a session to manage dynamic repositories of assets

•AssetTemporalSession: a session to access the temporal coverage of an asset

•AssetTemporalAssignmentSession: a session to manage the temporal coverage of an asset

•AssetSpatialSession: a session to access the spatial coverage of an asset

•AssetSpatialAssignmentSession: a session to manage the spatial coverage of an asset

•AssetCompositionSession: a session to look up asset composition mappings

•AssetCompositionDesignSession: a session to map assets to compositions

•CompositionLookupSession: a session to retrieve compositions

•CompositionQuerySession: a session to query compositions

•CompositionSearchSession: a session to search for compositions

•CompositionAdminSession: a session to create, update and delete compositions

•CompositionNotificationSession: a session to receive notifications pertaining to changes in compositions

•CompositionRepositorySession: a session to retrieve composition repository mappings

•CompositionRepositoryAssignmentSession: a session to manage composition repository mappings

•CompositionSmartRepositorySession: a session to manage dynamic repositories of compositions

•RepositoryLookupSession: a session to retrieve repositories

•RepositoryQuerySession: a session to query repositories

•RepositorySearchSession: a session to search for repositories

•RepositoryAdminSession: a session to create, update and delete repositories

•RepositoryNotificationSession: a session to receive notifications pertaining to changes in repositories

•RepositoryHierarchySession: a session to traverse repository hierarchies

•RepositoryHierarchyDesignSession: a session to manage repository hierarchies

## repository\_batch\_manager

Gets a RepositoryBatchManager.

**Returns** a RepostoryBatchManager

Return type osid.repository.batch.RepositoryBatchManager

Raise OperationFailed - unable to complete request

Raise Unimplemented - supports\_repository\_batch() is false

compliance: optional – This method must be implemented if 'supports\_repository\_batch()' is 'true'.

#### repository\_rules\_manager

Gets a RepositoryRulesManager.

**Returns** a RepostoryRulesManager

Return type osid.repository.rules.RepositoryRulesManager

**Raise** OperationFailed – unable to complete request

Raise Unimplemented - supports\_repository\_rules() is false

compliance: optional – This method must be implemented if "supports\_repository\_rules()" is "true".

## **Repository Lookup Methods**

```
RepositoryManager.can_lookup_repositories()
```

Tests if this user can perform Repository lookups.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

**Returns** false if lookup methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

RepositoryManager.use\_comparative\_repository\_view()

The returns from the repository methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

RepositoryManager.use\_plenary\_repository\_view()

A complete view of the Repository returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory - This method is must be implemented.

RepositoryManager.get\_repository (*repository\_id*) Gets the Repository specified by its Id. In plenary mode, the exact Id is found or a NotFound results. Otherwise, the returned Repository may have a different Id than requested, such as the case where a duplicate Id was assigned to a Repository and retained for compatibility.

Parameters repository\_id (osid.id.Id) - Id of the Repository

**Returns** the repository

Return type osid.repository.Repository

Raise NotFound - repository\_id not found

Raise NullArgument - repository\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method is must be implemented.

RepositoryManager.get\_repositories\_by\_ids (repository\_ids)

Gets a RepositoryList corresponding to the given IdList.

In plenary mode, the returned list contains all of the repositories specified in the Id list, in the order of the list, including duplicates, or an error results if an Id in the supplied list is not found or inaccessible. Otherwise, inaccessible Repositories may be omitted from the list and may present the elements in any order including returning a unique set.

Parameters repository\_ids (osid.id.IdList) - the list of Ids to retrieve

**Returns** the returned Repository list

Return type osid.repository.RepositoryList

Raise NotFound - an Id was not found

Raise NullArgument - repository\_ids is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

RepositoryManager.get\_repositories\_by\_genus\_type (repository\_genus\_type) Gets a RepositoryList corresponding to the given repository genus Type which does not include repositories of types derived from the specified Type.

In plenary mode, the returned list contains all known repositories or an error results. Otherwise, the returned list may contain only those repositories that are accessible through this session.

Parameters repository\_genus\_type (osid.type.Type) - a repository genus
type

Returns the returned Repository list

**Return type** osid.repository.RepositoryList

**Raise** NullArgument - repository\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

RepositoryManager.get\_repositories\_by\_parent\_genus\_type (repository\_genus\_type) Gets a RepositoryList corresponding to the given repository genus Type and include any additional repositories with genus types derived from the specified Type.

In plenary mode, the returned list contains all known repositories or an error results. Otherwise, the returned list may contain only those repositories that are accessible through this session.

Parameters repository\_genus\_type (osid.type.Type) - a repository genus
 type

Returns the returned Repository list

Return type osid.repository.RepositoryList

Raise NullArgument - repository\_genus\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

RepositoryManager.get\_repositories\_by\_record\_type (repository\_record\_type) Gets a RepositoryList containing the given repository record Type.

In plenary mode, the returned list contains all known repositories or an error results. Otherwise, the returned list may contain only those repositories that are accessible through this session.

**Parameters repository\_record\_type** (osid.type.Type) - a repository record type

Returns the returned Repository list

Return type osid.repository.RepositoryList

**Raise** NullArgument - repository\_record\_type is null

Raise OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

RepositoryManager.get\_repositories\_by\_provider (resource\_id) Gets a RepositoryList from the given provider "".

In plenary mode, the returned list contains all known repositories or an error results. Otherwise, the returned list may contain only those repositories that are accessible through this session.

Parameters resource\_id (osid.id.Id) - a resource Id

Returns the returned Repository list

Return type osid.repository.RepositoryList

**Raise** NullArgument - resource\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## RepositoryManager.repositories

Gets all Repositories.

In plenary mode, the returned list contains all known repositories or an error results. Otherwise, the returned list may contain only those repositories that are accessible through this session.

**Returns** a list of Repositories

Return type osid.repository.RepositoryList

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## **Repository Query Methods**

#### RepositoryManager.can\_search\_repositories()

Tests if this user can perform Repository searches.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer search operations to unauthorized users.

Returns false if search methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## RepositoryManager.repository\_query

Gets a repository query.

**Returns** the repository query

**Return type** osid.repository.RepositoryQuery

compliance: mandatory – This method must be implemented.

RepositoryManager.get\_repositories\_by\_query (repository\_query) Gets a list of Repositories matching the given repository query.

Parameters repository\_query (osid.repository.RepositoryQuery) the repository query

Returns the returned RepositoryList

Return type osid.repository.RepositoryList

Raise NullArgument - repository\_query is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

Raise Unsupported - repository\_query is not of this service

compliance: mandatory – This method must be implemented.

## **Repository Admin Methods**

#### RepositoryManager.can\_create\_repositories()

Tests if this user can create Repositories.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating a Repository will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer create operations to unauthorized users.

**Returns** false if Repository creation is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

RepositoryManager.can\_create\_repository\_with\_record\_types (repository\_record\_types) Tests if this user can create a single Repository using the desired record types.

While RepositoryManager.getRepositoryRecordTypes() can be used to examine which records are supported, this method tests which record(s) are required for creating a specific Repository. Providing an empty array tests if a Repository can be created with no records.

**Parameters repository\_record\_types** (osid.type.Type[]) - array of repository record types

**Returns** true if Repository creation using the specified Types is supported, false otherwise

Return type boolean

**Raise** NullArgument - repository\_record\_types is null

compliance: mandatory – This method must be implemented.

RepositoryManager.get\_repository\_form\_for\_create (*repository\_record\_types*) Gets the repository form for creating new repositories.

A new form should be requested for each create transaction.

```
Parameters repository_record_types (osid.type.Type[]) - array of repository record types
```

**Returns** the repository form

Return type osid.repository.RepositoryForm

**Raise** NullArgument - repository\_record\_types is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

Raise Unsupported – unable to get form for requested record types

compliance: mandatory – This method must be implemented.

```
RepositoryManager.create_repository(repository_form)
```

Creates a new Repository.

```
Parameters repository_form (osid.repository.RepositoryForm) - the form for this Repository
```

**Returns** the new Repository

Return type osid.repository.Repository

**Raise** IllegalState - repository\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

Raise NullArgument - repository\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

**Raise** Unsupported – repository\_form did not originate from get\_repository\_form\_for\_create()

compliance: mandatory – This method must be implemented.

RepositoryManager.can\_update\_repositories()

Tests if this user can update Repositories.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating a Repository will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer update operations to unauthorized users.

**Returns** false if Repository modification is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
RepositoryManager.get_repository_form_for_update (repository_id)
Gets the repository form for updating an existing repository.
```

A new repository form should be requested for each update transaction.

Parameters repository\_id (osid.id.Id) - the Id of the Repository

Returns the repository form

Return type osid.repository.RepositoryForm

Raise NotFound - repository\_id is not found

**Raise** NullArgument - repository\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### RepositoryManager.update\_repository(repository\_form)

Updates an existing repository.

**Parameters repository\_form** (osid.repository.RepositoryForm) – the form containing the elements to be updated

Raise IllegalState - repository\_form already used in an update transaction

Raise InvalidArgument - the form contains an invalid value

**Raise** NullArgument - repository\_form is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

**Raise** Unsupported – repository\_form did not originate from get\_repository\_form\_for\_update()

*compliance: mandatory – This method must be implemented.* 

RepositoryManager.can\_delete\_repositories()

Tests if this user can delete Repositories.

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting a Repository will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer delete operations to unauthorized users.

**Returns** false if Repository deletion is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

RepositoryManager.delete\_repository(repository\_id) Deletes a Repository.

> Parameters repository\_id (osid.id.Id) - the Id of the Repository to remove

**Raise** NotFound - repository\_id not found

Raise NullArgument - repository\_id is null

Raise OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

RepositoryManager.can\_manage\_repository\_aliases()

Tests if this user can manage Id aliases for repositories.

A return of true does not guarantee successful authorization. A return of false indicates that it is known changing an alias will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer alias operations to an unauthorized user.

Returns false if Repository aliasing is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

RepositoryManager.alias\_repository (repository\_id, alias\_id)

Adds an Id to a Repository for the purpose of creating compatibility.

The primary Id of the Repository is determined by the provider. The new Id is an alias to the primary Id. If the alias is a pointer to another repository, it is reassigned to the given repository Id.

### **Parameters**

• repository\_id (osid.id.Id) - the Id of a Repository

• alias\_id (osid.id.Id) - the alias Id

**Raise** AlreadyExists - alias\_id is in use as a primary Id

Raise NotFound - repository\_id not found

Raise NullArgument - repository\_id or alias\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

#### **Repository Hierarchy Methods**

RepositoryManager.**repository\_hierarchy\_id** Gets the hierarchy Id associated with this session.

Returns the hierarchy Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

## ${\tt Repository} {\tt Manager.repository\_hierarchy}$

Gets the hierarchy associated with this session.

**Returns** the hierarchy associated with this session

Return type osid.hierarchy.Hierarchy

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## RepositoryManager.can\_access\_repository\_hierarchy()

Tests if this user can perform hierarchy queries.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations.

Returns false if hierarchy traversal methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### RepositoryManager.use\_comparative\_repository\_view()

The returns from the repository methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

## RepositoryManager.use\_plenary\_repository\_view()

A complete view of the Repository returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

## RepositoryManager.root\_repository\_ids

Gets the root repository Ids in this hierarchy.

Returns the root repository Ids

Return type osid.id.IdList

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

#### RepositoryManager.root\_repositories

Gets the root repositories in the repository hierarchy.

A node with no parents is an orphan. While all repository Ids are known to the hierarchy, an orphan does not appear in the hierarchy unless explicitly added as a root node or child of another node.

**Returns** the root repositories

Return type osid.repository.RepositoryList

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method is must be implemented.

RepositoryManager.has\_parent\_repositories (repository\_id) Tests if the Repository has any parents.

Parameters repository\_id (osid.id.Id) - a repository Id

**Returns** true if the repository has parents, false otherwise

Return type boolean

Raise NotFound - repository\_id is not found

Raise NullArgument - repository\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

RepositoryManager.**is\_parent\_of\_repository** (*id\_*, *repository\_id*) Tests if an Id is a direct parent of a repository.

#### **Parameters**

• id (osid.id.Id) - an Id

• repository\_id (osid.id.Id) - the Id of a repository

Returns true if this id is a parent of repository\_id, false otherwise

Return type boolean

Raise NotFound - repository\_id is not found

Raise NullArgument - id or repository\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented. implementation notes:* If id not found return false.

RepositoryManager.get\_parent\_repository\_ids (*repository\_id*) Gets the parent Ids of the given repository.

Parameters repository\_id (osid.id.Id) - a repository Id

Returns the parent Ids of the repository

Return type osid.id.IdList

**Raise** NotFound – repository\_id is not found

Raise NullArgument - repository\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

RepositoryManager.get\_parent\_repositories (*repository\_id*) Gets the parents of the given repository.

Parameters repository\_id (osid.id.Id) - the Id to query

**Returns** the parents of the repository

Return type osid.repository.RepositoryList

Raise NotFound - repository\_id not found

Raise NullArgument - repository\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

RepositoryManager.is\_ancestor\_of\_repository (*id\_*, *repository\_id*) Tests if an Id is an ancestor of a repository.

#### **Parameters**

- id (osid.id.Id) an Id
- repository\_id (osid.id.Id) the Id of a repository

**Returns** true if this id is an ancestor of repository\_id, false otherwise

Return type boolean

**Raise** NotFound - repository\_id not found

Raise NullArgument - repository\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented. implementation notes:* If id not found return false.

## RepositoryManager.has\_child\_repositories(repository\_id)

Tests if a repository has any children.

Parameters repository\_id (osid.id.Id) - a repository Id

Returns true if the repository\_id has children, false otherwise

Return type boolean

Raise NotFound - repository\_id not found

**Raise** NullArgument - repository\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

RepositoryManager.**is\_child\_of\_repository** (*id\_, repository\_id*) Tests if a node is a direct child of another.

## **Parameters**

- id (osid.id.Id) an Id
- repository\_id (osid.id.Id) the Id of a repository

**Returns** true if the id is a child of repository\_id, false otherwise

Return type boolean

Raise NotFound - repository\_id not found

**Raise** NullArgument - repository\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented. implementation notes*: If id not found return false.

RepositoryManager.get\_child\_repository\_ids (*repository\_id*) Gets the Ids of the children of the given repository.

Parameters repository\_id (osid.id.Id) - the Id to query

**Returns** the children of the repository

Return type osid.id.IdList

Raise NotFound - repository\_id not found

Raise NullArgument - repository\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

## RepositoryManager.get\_child\_repositories(repository\_id)

Gets the children of the given repository.

Parameters repository\_id (osid.id.Id) - the Id to query

Returns the children of the repository

Return type osid.repository.RepositoryList

**Raise** NotFound – repository\_id not found

**Raise** NullArgument - repository\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

RepositoryManager.**is\_descendant\_of\_repository** (*id\_, repository\_id*) Tests if an Id is a descendant of a repository.

## **Parameters**

• id (osid.id.Id) - an Id

• repository\_id (osid.id.Id) - the Id of a repository

Returns true if the id is a descendant of the repository\_id, false otherwise

Return type boolean

Raise NotFound - repository\_id not found

Raise NullArgument - repository\_id or id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

*compliance: mandatory – This method must be implemented. implementation notes:* If id is not found return false.

RepositoryManager.get\_repository\_node\_ids (repository\_id, ancestor\_levels, descendant\_levels, include\_siblings)

Gets a portion of the hierarchy for the given repository.

## Parameters

- repository\_id (osid.id.Id) the Id to query
- **ancestor\_levels** (cardinal) the maximum number of ancestor levels to include. A value of 0 returns no parents in the node.
- **descendant\_levels** (cardinal) the maximum number of descendant levels to include. A value of 0 returns no children in the node.
- **include\_siblings** (boolean) true to include the siblings of the given node, false to omit the siblings

Returns the specified repository node

Return type osid.hierarchy.Node

Raise NotFound-repository\_id not found

Raise NullArgument - repository\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

RepositoryManager.get\_repository\_nodes (repository\_id, ancestor\_levels, descen-

dant\_levels, include\_siblings)

Gets a portion of the hierarchy for the given repository.

## Parameters

- repository\_id (osid.id.Id) the Id to query
- **ancestor\_levels** (cardinal) the maximum number of ancestor levels to include. A value of 0 returns no parents in the node.
- **descendant\_levels** (cardinal) the maximum number of descendant levels to include. A value of 0 returns no children in the node.
- **include\_siblings** (boolean) true to include the siblings of the given node, false to omit the siblings

Returns the specified repository node

Return type osid.repository.RepositoryNode

Raise NotFound - repository\_id not found

Raise NullArgument - repository\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## **Repository Hierarchy Design Methods**

```
RepositoryManager.repository_hierarchy_id
Gets the hierarchy Id associated with this session.
```

Returns the hierarchy Id associated with this session

**Return type** osid.id.Id

compliance: mandatory – This method must be implemented.

#### RepositoryManager.repository\_hierarchy

Gets the hierarchy associated with this session.

Returns the hierarchy associated with this session

Return type osid.hierarchy.Hierarchy

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

RepositoryManager.can\_modify\_repository\_hierarchy()

Tests if this user can change the hierarchy.

A return of true does not guarantee successful authorization. A return of false indicates that it is known performing any update will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer these operations to an unauthorized user.

**Returns** false if changing this hierarchy is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
RepositoryManager.add_root_repository(repository_id)
```

Adds a root repository.

Parameters repository\_id (osid.id.Id) - the Id of a repository

Raise AlreadyExists - repository\_id is already in hierarchy

**Raise** NotFound - repository\_id not found

Raise NullArgument - repository\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

RepositoryManager.remove\_root\_repository(repository\_id)

Removes a root repository.

Parameters repository\_id (osid.id.Id) - the Id of a repository

**Raise** NotFound – repository\_id not a root

**Raise** NullArgument - repository\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

RepositoryManager.add\_child\_repository (*repository\_id*, *child\_id*) Adds a child to a repository.

**Parameters** 

• repository\_id (osid.id.Id) - the Id of a repository

• child\_id (osid.id.Id) - the Id of the new child

**Raise** AlreadyExists - repository\_id is already a parent of child\_id

Raise NotFound - repository\_id or child\_id not found

**Raise** NullArgument - repository id or child id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

RepositoryManager.remove\_child\_repository (repository\_id, child\_id) Removes a child from a repository.

#### **Parameters**

• repository\_id (osid.id.Id) - the Id of a repository

• child id (osid.id.Id) - the Id of the new child

**Raise** NotFound – repository id not a parent of child id

**Raise** NullArgument - repository\_id or child\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

RepositoryManager.remove\_child\_repositories (repository\_id) Removes all children from a repository.

**Parameters repository\_id** (osid.id.Id) - the Id of a repository

**Raise** NotFound – repository\_id not in hierarchy

**Raise** NullArgument - repository\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## Repository

## Repository

class dlkit.services.repository.Repository (provider\_manager, catalog, runtime, proxy, \*\*kwargs) Bases: dlkit.osid.objects.OsidCatalog, dlkit.osid.sessions.OsidSession

A repository defines a collection of assets.

```
get repository record (repository record type)
    Gets the record corresponding to the given Repository record Type.
```

This method is used to retrieve an object implementing the requested record. repository\_record\_type may be the Type returned in get\_record\_types() or any of

The

its parents in a Type hierarchy where has\_record\_type (repository\_record\_type) is true

**Parameters repository\_record\_type** (osid.type.Type) – a repository record type **Returns** the repository record

Return type osid.repository.records.RepositoryRecord

**Raise** NullArgument - repository\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type (repository\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Asset Lookup Methods**

## Repository.repository\_id

Gets the Repository Id associated with this session.

Returns the Repository Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

### Repository. repository

Gets the Repository associated with this session.

Returns the Repository associated with this session

Return type osid.repository.Repository

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Repository.can\_lookup\_assets()

Tests if this user can perform Asset lookups.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations.

Returns false if lookup methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### Repository.use\_comparative\_asset\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

### Repository.use\_plenary\_asset\_view()

A complete view of the Asset returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory - This method is must be implemented.

```
Repository.use_federated_repository_view()
```

Federates the view for methods in this session.

A federated view will include compositions in repositories which are children of this repository in the repository hierarchy.

compliance: mandatory – This method is must be implemented.

```
Repository.use_isolated_repository_view()
```

Isolates the view for methods in this session.

An isolated view restricts lookups to this repository only.

compliance: mandatory – This method is must be implemented.

```
Repository.get_asset (asset_id)
```

Gets the Asset specified by its Id.

In plenary mode, the exact Id is found or a NotFound results. Otherwise, the returned Asset may have a different Id than requested, such as the case where a duplicate Id was assigned to an Asset and retained for compatibility.

Parameters asset\_id (osid.id.Id) - the Id of the Asset to retrieve

Returns the returned Asset

Return type osid.repository.Asset

Raise NotFound - no Asset found with the given Id

Raise NullArgument - asset\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Repository.get\_assets\_by\_ids (asset\_ids)

Gets an AssetList corresponding to the given IdList.

In plenary mode, the returned list contains all of the assets specified in the Id list, in the order of the list, including duplicates, or an error results if an Id in the supplied list is not found or inaccessible. Otherwise, inaccessible Assets may be omitted from the list and may present the elements in any order including returning a unique set.

Parameters asset\_ids (osid.id.IdList) - the list of Ids to retrieve

Returns the returned Asset list

Return type osid.repository.AssetList

Raise NotFound - an Id was not found

**Raise** NullArgument - asset\_ids is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

Repository.get\_assets\_by\_genus\_type (asset\_genus\_type)

Gets an AssetList corresponding to the given asset genus Type which does not include assets of types derived from the specified Type.

In plenary mode, the returned list contains all known assets or an error results. Otherwise, the returned list may contain only those assets that are accessible through this session.

**Parameters** asset\_genus\_type (osid.type.Type) - an asset genus type

Returns the returned Asset list

Return type osid.repository.AssetList

**Raise** NullArgument - asset\_genus\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Repository.get\_assets\_by\_parent\_genus\_type (asset\_genus\_type)

Gets an AssetList corresponding to the given asset genus Type and include any additional assets with genus types derived from the specified Type.

In plenary mode, the returned list contains all known assets or an error results. Otherwise, the returned list may contain only those assets that are accessible through this session.

Parameters asset\_genus\_type (osid.type.Type) - an asset genus type

Returns the returned Asset list

Return type osid.repository.AssetList

**Raise** NullArgument - asset\_genus\_type is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Repository.get\_assets\_by\_record\_type (asset\_record\_type)

Gets an AssetList containing the given asset record Type.

In plenary mode, the returned list contains all known assets or an error results. Otherwise, the returned list may contain only those assets that are accessible through this session.

**Parameters asset\_record\_type** (osid.type.Type) – an asset record type

Returns the returned Asset list

Return type osid.repository.AssetList

**Raise** NullArgument - asset\_record\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented.* 

Repository.get\_assets\_by\_provider (resource\_id) Gets an AssetList from the given provider.

In plenary mode, the returned list contains all known assets or an error results. Otherwise, the returned list may contain only those assets that are accessible through this session.

Parameters resource\_id (osid.id.Id) - a resource Id

Returns the returned Asset list

Return type osid.repository.AssetList

Raise NullArgument - resource\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

## Repository.assets

Gets all Assets.

In plenary mode, the returned list contains all known assets or an error results. Otherwise, the returned list may contain only those assets that are accessible through this session.

Returns a list of Assets

**Return type** osid.repository.AssetList

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# **Asset Query Methods**

```
Repository.repository_id
```

Gets the Repository Id associated with this session.

Returns the Repository Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

Repository.repository

Gets the Repository associated with this session.

Returns the Repository associated with this session

Return type osid.repository.Repository

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Repository.can\_search\_assets()

Tests if this user can perform Asset searches.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer search operations to unauthorized users.

Returns false if search methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
Repository.use_federated_repository_view()
Federates the view for methods in this session.
```

A federated view will include compositions in repositories which are children of this repository in the repository hierarchy.

compliance: mandatory – This method is must be implemented.

```
Repository.use_isolated_repository_view() Isolates the view for methods in this session.
```

An isolated view restricts lookups to this repository only.

compliance: mandatory – This method is must be implemented.

#### Repository.asset\_query

Gets an asset query.

**Returns** the asset query

Return type osid.repository.AssetQuery

compliance: mandatory – This method must be implemented.

Repository.get\_assets\_by\_query (asset\_query) Gets a list of Assets matching the given asset query.

Parameters asset\_query (osid.repository.AssetQuery) - the asset query

Returns the returned AssetList

**Return type** osid.repository.AssetList

**Raise** NullArgument - asset\_query is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

**Raise** Unsupported – the asset\_query is not of this service

compliance: mandatory – This method must be implemented.

# **Asset Search Methods**

```
Repository.asset_search
```

Gets an asset search.

**Returns** the asset search

Return type osid.repository.AssetSearch

compliance: mandatory – This method must be implemented.

# Repository.asset\_search\_order

Gets an asset search order.

The AssetSearchOrder is supplied to an AssetSearch to specify the ordering of results.

**Returns** the asset search order

Return type osid.repository.AssetSearchOrder

compliance: mandatory – This method must be implemented.

```
Repository.get_assets_by_search (asset_query, asset_search)
Gets the search results matching the given search query using the given search.
```

Parameters

• asset\_query (osid.repository.AssetQuery) - the asset query

• asset\_search (osid.repository.AssetSearch) - the asset search

Returns the asset search results

Return type osid.repository.AssetSearchResults

**Raise** NullArgument - asset\_query or asset\_search is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

Raise Unsupported - asset\_query or asset\_search is not of this service

compliance: mandatory – This method must be implemented.

Repository.get\_asset\_query\_from\_inspector(*asset\_query\_inspector*) Gets an asset query from an inspector.

The inspector is available from a AssetSearchResults.

**Parameters asset\_query\_inspector** AssetQueryInspector) – an asset query inspector (osid.repository.

**Returns** the asset query

Return type osid.repository.AssetQuery

Raise NullArgument - asset\_query\_inspector is null

Raise Unsupported - asset\_query\_inspector is not of this service

compliance: mandatory – This method must be implemented.

# **Asset Admin Methods**

```
Repository.repository_id
```

Gets the Repository Id associated with this session.

Returns the Repository Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### Repository.repository

Gets the Repository associated with this session.

Returns the Repository associated with this session

**Return type** osid.repository.Repository

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# Repository.can\_create\_assets()

Tests if this user can create Assets.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating an Asset will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer create operations to an unauthorized user.

Returns false if Asset creation is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
Repository.can_create_asset_with_record_types (asset_record_types)
Tests if this user can create a single Asset using the desired record types.
```

While RepositoryManager.getAssetRecordTypes() can be used to examine which records are supported, this method tests which record(s) are required for creating a specific Asset. Providing an empty array tests if an Asset can be created with no records.

- Parameters asset\_record\_types (osid.type.Type[]) array of asset record
  types
- **Returns** true if Asset creation using the specified record Types is supported, false otherwise

Return type boolean

**Raise** NullArgument - asset\_record\_types is null

compliance: mandatory – This method must be implemented.

```
Repository.get_asset_form_for_create (asset_record_types)
Gets the asset form for creating new assets.
```

A new form should be requested for each create transaction.

Parameters asset\_record\_types (osid.type.Type[]) - array of asset record
types

Returns the asset form

Return type osid.repository.AssetForm

**Raise** NullArgument - asset\_record\_types is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported – unable to get form for requested record types

compliance: mandatory – This method must be implemented.

Repository.create\_asset (asset\_form)

Creates a new Asset.

Parameters asset\_form (osid.repository.AssetForm) - the form for this
 Asset

Returns the new Asset

Return type osid.repository.Asset

Raise IllegalState - asset\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

Raise NullArgument - asset\_form is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported - asset\_form did not originate from
 get\_asset\_form\_for\_create()

compliance: mandatory – This method must be implemented.

# Repository.can\_update\_assets()

Tests if this user can update Assets.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating an Asset will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer update operations to an unauthorized user.

Returns false if Asset modification is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
Repository.get_asset_form_for_update (asset_id)
```

Gets the asset form for updating an existing asset.

A new asset form should be requested for each update transaction.

Parameters asset\_id (osid.id.Id) - the Id of the Asset

**Returns** the asset form

Return type osid.repository.AssetForm

**Raise** NotFound - asset\_id is not found

Raise NullArgument - asset\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Repository.update\_asset (asset\_form)

Updates an existing asset.

**Parameters asset\_form** (osid.repository.AssetForm) - the form containing the elements to be updated

Raise IllegalState - asset\_form already used in anupdate transaction

Raise InvalidArgument - the form contains an invalid value

Raise NullArgument - asset\_form is null

**Raise** OperationFailed – unable to complete request

 $Raise \; \texttt{PermissionDenied}-authorization\; failure$ 

**Raise** Unsupported - asset\_form did not originate from get\_asset\_form\_for\_update()

compliance: mandatory – This method must be implemented.

#### Repository.can\_delete\_assets()

Tests if this user can delete Assets.

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting an Asset will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer delete operations to an unauthorized user.

Returns false if Asset deletion is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Repository.delete\_asset (asset\_id)

Deletes an Asset.

**Parameters asset\_id** (osid.id.Id) - the Id of the Asset to remove

**Raise** NotFound-asset\_id not found

Raise NullArgument - asset\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

```
Repository.can_manage_asset_aliases()
```

Tests if this user can manage Id aliases for Assets.

A return of true does not guarantee successful authorization. A return of false indicates that it is known changing an alias will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer alias operations to an unauthorized user.

Returns false if Asset aliasing is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Repository.alias\_asset (asset\_id, alias\_id)

Adds an Id to an Asset for the purpose of creating compatibility.

The primary Id of the Asset is determined by the provider. The new Id performs as an alias to the primary Id. If the alias is a pointer to another asset, it is reassigned to the given asset Id.

#### **Parameters**

• asset\_id (osid.id.Id) - the Id of an Asset

• alias\_id (osid.id.Id) - the alias Id

**Raise** AlreadyExists – alias\_id is already assigned

**Raise** NotFound-asset\_id not found

**Raise** NullArgument - asset\_id or alias\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

#### Repository.can\_create\_asset\_content()

Tests if this user can create content for Assets.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating an AssetContent will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer create operations to an unauthorized user.

**Returns** false if Asset content creation is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Repository.can\_create\_asset\_content\_with\_record\_types (asset\_content\_record\_types) Tests if this user can create an AssetContent using the desired record types.

While RepositoryManager.getAssetContentRecordTypes() can be used to test which records are supported, this method tests which records are required for creating a specific AssetContent. Providing an empty array tests if an AssetContent can be created with no records.

- **Parameters** asset\_content\_record\_types (osid.type.Type[]) array of asset content record types
- **Returns** true if AssetContent creation using the specified Types is supported, false otherwise

Return type boolean

**Raise** NullArgument - asset\_content\_record\_types is null

compliance: mandatory – This method must be implemented.

```
Repository.get_asset_content_form_for_create(asset_id, as-
```

set content record types)

Gets an asset content form for creating new assets.

#### **Parameters**

- **asset\_id** (osid.id.Id) the Id of an Asset
- asset\_content\_record\_types (osid.type.Type[]) array of asset content record types

Returns the asset content form

Return type osid.repository.AssetContentForm

Raise NotFound - asset\_id is not found

**Raise** NullArgument-asset\_id or asset\_content\_record\_types is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

**Raise** Unsupported – unable to get form for requested record types

compliance: mandatory – This method must be implemented.

Repository.create\_asset\_content (asset\_content\_form) Creates new AssetContent for a given asset.

> Parameters asset\_content\_form (osid.repository. AssetContentForm) - the form for this AssetContent

Returns the new AssetContent

Return type osid.repository.AssetContent

**Raise** IllegalState - asset\_content\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

**Raise** NullArgument - asset\_content\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

Raise Unsupported - asset\_content\_form did not originate from
 get\_asset\_content\_form\_for\_create()

compliance: mandatory – This method must be implemented.

```
Repository.can_update_asset_contents()
```

Tests if this user can update AssetContent.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating an AssetContent will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer update operations to an unauthorized user.

Returns false if AssetContent modification is not authorized, true otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

Repository.get\_asset\_content\_form\_for\_update (*asset\_content\_id*) Gets the asset content form for updating an existing asset content.

A new asset content form should be requested for each update transaction.

Parameters asset\_content\_id (osid.id.Id) - the Id of the AssetContent

Returns the asset content form

Return type osid.repository.AssetContentForm

Raise NotFound-asset\_content\_id is not found

**Raise** NullArgument - asset\_content\_id is null

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

Repository.update\_asset\_content (*asset\_content\_form*) Updates an existing asset content.

**Parameters asset\_content\_form** (osid.repository. AssetContentForm) – the form containing the elements to be updated

**Raise** IllegalState - asset\_content\_form already used in an update transaction

**Raise** InvalidArgument – the form contains an invalid value

Raise NullArgument - asset\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported - asset\_content\_form did not originate from
 get\_asset\_content\_form\_for\_update()

compliance: mandatory – This method must be implemented.

#### Repository.can\_delete\_asset\_contents()

Tests if this user can delete AssetsContents.

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting an AssetContent will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer delete operations to an unauthorized user.

Returns false if AssetContent deletion is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Repository.delete\_asset\_content(asset\_content\_id)

Deletes content from an Asset.

Parameters asset\_content\_id (osid.id.Id) - the Id of the AssetContent

**Raise** NotFound-asset\_content\_id is not found

**Raise** NullArgument - asset\_content\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# **Asset Notification Methods**

#### Repository.**repository\_id**

Gets the Repository Id associated with this session.

**Returns** the Repository Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### Repository.repository

Gets the Repository associated with this session.

**Returns** the Repository associated with this session

Return type osid.repository.Repository

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Repository.can\_register\_for\_asset\_notifications()

Tests if this user can register for Asset notifications.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer notification operations.

Returns false if notification methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# Repository.use\_federated\_repository\_view()

Federates the view for methods in this session.

A federated view will include compositions in repositories which are children of this repository in the repository hierarchy.

compliance: mandatory – This method is must be implemented.

# Repository.use\_isolated\_repository\_view() Isolates the view for methods in this session.

An isolated view restricts lookups to this repository only.

compliance: mandatory - This method is must be implemented.

# Repository.register\_for\_new\_assets()

Register for notifications of new assets.

AssetReceiver.newAssets() is invoked when a new Asset appears in this repository.

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Repository.register\_for\_new\_assets\_by\_genus\_type (asset\_genus\_type) Registers for notification of new assets of the given asset genus type.

AssetReceiver.newAssets() is invoked when an asset is appears in this repository.

**Parameters asset\_genus\_type** (osid.type.Type) - the genus type of the Asset to monitor

**Raise** NullArgument - asset\_genus\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# Repository.register\_for\_changed\_assets() Registers for notification of updated assets.

AssetReceiver.changedAssets() is invoked when an asset in this repository is changed.

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# Repository.**register\_for\_changed\_assets\_by\_genus\_type** (*asset\_genus\_type*) Registers for notification of updated assets of the given asset genus type.

AssetReceiver.changedAssets() is invoked when an asset in this repository is changed.

# **Parameters asset\_genus\_type** (osid.type.Type) - the genus type of the Asset to monitor

**Raise** NullArgument - asset\_genus\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

#### Repository.register\_for\_changed\_asset (asset\_id)

Registers for notification of an updated asset.

AssetReceiver.changedAssets() is invoked when the specified asset in this repository is changed.

**Parameters asset\_id** (osid.id.Id) – the Id of the Asset to monitor

**Raise** NullArgument - asset\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Repository.register\_for\_deleted\_assets()

Registers for notification of deleted assets.

AssetReceiver.deletedAssets() is invoked when an asset is deleted or removed from this repository.

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Repository.register\_for\_deleted\_assets\_by\_genus\_type (*asset\_genus\_type*) Registers for notification of deleted assets of the given asset genus type.

AssetReceiver.deletedAssets() is invoked when an asset is deleted or removed from this repository.

**Parameters asset\_genus\_type** (osid.type.Type) - the genus type of the Asset to monitor

**Raise** NullArgument - asset\_genus\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Repository.**register\_for\_deleted\_asset** (*asset\_id*) Registers for notification of a deleted asset.

AssetReceiver.deletedAssets() is invoked when the specified asset is deleted or removed from this repository.

Parameters asset\_id (osid.id.Id) - the Id of the Asset to monitor

**Raise** NullArgument - asset\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Repository.reliable\_asset\_notifications() Reliable notifications are desired.

In reliable mode, notifications are to be acknowledged using acknowledge\_item\_notification().

*compliance: mandatory – This method is must be implemented.* 

## Repository.unreliable\_asset\_notifications() Unreliable notifications are desired.

In unreliable mode, notifications do not need to be acknowledged.

compliance: mandatory – This method is must be implemented.

Repository.acknowledge\_asset\_notification (*notification\_id*) Acknowledge an asset notification.

Parameters notification\_id (osid.id.Id) - the Id of the notification

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# **Asset Repository Methods**

Repository.can\_lookup\_asset\_repository\_mappings()

Tests if this user can perform lookups of asset/repository mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known lookup methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

Returns false if looking up mappings is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### Repository.use\_comparative\_repository\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

# Repository.use\_plenary\_repository\_view()

A complete view of the Asset and Repository returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

# Repository.get\_asset\_ids\_by\_repository(repository\_id)

Gets the list of Asset Ids associated with a Repository.

Parameters repository\_id (osid.id.Id) - Id of the Repository

Returns list of related asset Ids

Return type osid.id.IdList

Raise NotFound - repository\_id is not found

**Raise** NullArgument - repository\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Repository.get\_assets\_by\_repository (*repository\_id*) Gets the list of Assets associated with a Repository.

Parameters repository\_id (osid.id.Id) - Id of the Repository

Returns list of related assets

Return type osid.repository.AssetList

Raise NotFound - repository\_id is not found

**Raise** NullArgument - repository\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# Repository.get\_asset\_ids\_by\_repositories (*repository\_ids*) Gets the list of Asset Ids corresponding to a list of Repository objects.

Parameters repository\_ids (osid.id.IdList) - list of repository Ids

Returns list of asset Ids

Return type osid.id.IdList

Raise NullArgument - repository\_ids is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

Repository.get\_assets\_by\_repositories (*repository\_ids*) Gets the list of Assets corresponding to a list of Repository objects.

Parameters repository\_ids (osid.id.IdList) - list of repository Ids

Returns list of assets

**Return type** osid.repository.AssetList

**Raise** NullArgument - repository\_ids is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## Repository.get\_repository\_ids\_by\_asset (asset\_id) Gets the list of Repository Ids mapped to an Asset.

Parameters asset\_id (osid.id.Id) - Id of an Asset

Returns list of repository Ids

Return type osid.id.IdList

Raise NotFound-asset\_id is not found

**Raise** NullArgument - asset\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

Repository.get\_repositories\_by\_asset (*asset\_id*) Gets the list of Repository objects mapped to an Asset. Parameters asset\_id (osid.id.Id) - Id of an Asset Returns list of repositories Return type osid.repository.RepositoryList Raise NotFound - asset\_id is not found Raise NullArgument - asset\_id is null Raise OperationFailed - unable to complete request Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

# **Asset Repository Assignment Methods**

```
Repository.can_assign_assets()
```

Tests if this user can alter asset/repository mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known mapping methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer assignment operations to unauthorized users.

**Returns** false if mapping is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
Repository.can_assign_assets_to_repository(repository_id)
```

Tests if this user can alter asset/repository mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known mapping methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer assignment operations to unauthorized users.

Parameters repository\_id (osid.id.Id) - the Id of the Repository

**Returns** false if mapping is not authorized, true otherwise

Return type boolean

Raise NullArgument - repository\_id is null

compliance: mandatory – This method must be implemented.

Repository.get\_assignable\_repository\_ids (repository\_id)

Gets a list of repositories including and under the given repository node in which any composition can be assigned.

Parameters repository\_id (osid.id.Id) - the Id of the Repository

Returns list of assignable repository Ids

Return type osid.id.IdList

Raise NullArgument - repository\_id is null

**Raise** OperationFailed – unable to complete request

*compliance: mandatory – This method must be implemented.* 

```
Repository.get_assignable_repository_ids_for_asset (repository_id, as-
```

set\_id)

Gets a list of repositories including and under the given repository node in which a specific asset can be assigned.

#### **Parameters**

- repository\_id (osid.id.Id) the Id of the Repository
- asset\_id (osid.id.Id) the Id of the Asset

Returns list of assignable repository Ids

Return type osid.id.IdList

Raise NullArgument - repository\_id or asset\_id is null

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

Repository.**assign\_asset\_to\_repository** (*asset\_id*, *repository\_id*) Adds an existing Asset to a Repository.

#### **Parameters**

- asset\_id (osid.id.Id) the Id of the Asset
- repository\_id (osid.id.Id) the Id of the Repository

Raise AlreadyExists - asset\_id already assigned to repository\_id

Raise NotFound - asset\_id or repository\_id not found

Raise NullArgument - asset\_id or repository\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

```
Repository.unassign_asset_from_repository (asset_id, repository_id)
Removes an Asset from a Repository.
```

Parameters

- asset id (osid.id.Id) the Id of the Asset
- repository\_id (osid.id.Id) the Id of the Repository
- Raise NotFound asset\_id or repository\_id not found or asset\_id not assigned to repository\_id
- Raise NullArgument asset\_id or repository\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

## **Asset Composition Methods**

```
Repository.repository_id
```

Gets the Repository Id associated with this session.

Returns the Repository Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### Repository.repository

Gets the Repository associated with this session.

**Returns** the Repository associated with this session

Return type osid.repository.Repository

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented.* 

#### Repository.can\_access\_asset\_compositions()

Tests if this user can perform composition lookups.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

**Returns** false if lookup methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### Repository.use\_comparative\_asset\_composition\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

# Repository.use\_plenary\_asset\_composition\_view()

A complete view of the returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory - This method is must be implemented.

# Repository.use\_federated\_repository\_view()

Federates the view for methods in this session.

A federated view will include compositions in repositories which are children of this repository in the repository hierarchy.

compliance: mandatory – This method is must be implemented.

#### Repository.use\_isolated\_repository\_view()

Isolates the view for methods in this session.

An isolated view restricts lookups to this repository only.

compliance: mandatory – This method is must be implemented.

Repository.get\_composition\_assets (composition\_id) Gets the list of assets mapped to the given Composition.

Parameters composition\_id (osid.id.Id) - Id of the Composition

**Returns** list of assets

Return type osid.repository.AssetList

Raise NotFound - composition\_id not found

**Raise** NullArgument - composition\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method is must be implemented.

Repository.get\_compositions\_by\_asset (asset\_id) Gets a list of compositions including the given asset.

Parameters asset\_id (osid.id.Id) - Id of the Asset

**Returns** the returned Composition list

Return type osid.repository.CompositionList

**Raise** NotFound-asset\_id is not found

Raise NullArgument - asset\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

## Asset Composition Design Methods

```
Repository.repository_id
```

Gets the Repository Id associated with this session.

Returns the Repository Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### Repository.repository

Gets the Repository associated with this session.

Returns the Repository associated with this session

Return type osid.repository.Repository

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Repository.can\_compose\_assets()

Tests if this user can manage mapping of Assets to Compositions.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as an application hint that may opt not to offer composition operations.

Returns false if asset composition is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Repository.add\_asset (asset\_id, composition\_id)

Appends an asset to a composition.

# Parameters

- asset\_id (osid.id.Id) Id of the Asset
- composition\_id (osid.id.Id) Id of the Composition

Raise AlreadyExists - asset\_id already part composition\_id

Raise NotFound-asset\_id or composition\_id not found

**Raise** NullArgument - asset\_id or composition\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization fauilure

compliance: mandatory – This method must be implemented.

Repository.move\_asset\_ahead (asset\_id, composition\_id, reference\_id)

Reorders assets in a composition by moving the specified asset in front of a reference asset.

#### Parameters

- asset\_id (osid.id.Id) Id of the Asset
- composition\_id (osid.id.Id) Id of the Composition
- reference\_id (osid.id.Id) Id of the reference Asset
- Raise NotFound asset\_id or reference\_id not found in
   composition\_id
- Raise NullArgument asset\_id, reference\_id or composition\_id is
   null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization fauilure

compliance: mandatory – This method must be implemented.

Repository.move\_asset\_behind (asset\_id, composition\_id, reference\_id)

Reorders assets in a composition by moving the specified asset behind of a reference asset.

#### Parameters

- asset\_id (osid.id.Id) Id of the Asset
- composition\_id (osid.id.Id) Id of the Composition
- reference\_id (osid.id.Id) Id of the reference Asset
- Raise NotFound asset\_id or reference\_id not found in
   composition\_id
- Raise NullArgument asset\_id, reference\_id or composition\_id is
   null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization fauilure

compliance: mandatory – This method must be implemented.

Repository.order\_assets (*asset\_ids*, *composition\_id*) Reorders a set of assets in a composition.

#### **Parameters**

- asset\_ids (osid.id.Id[]) Ids for a set of Assets
- composition\_id (osid.id.Id) Id of the Composition
- **Raise** NotFound composition\_id not found or, an asset\_id not related to composition\_id

**Raise** NullArgument - instruction\_ids or agenda\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Repository.remove\_asset (asset\_id, composition\_id)

Removes an Asset from a Composition.

## Parameters

- asset\_id (osid.id.Id) Id of the Asset
- composition\_id (osid.id.Id) Id of the Composition

Raise NotFound-asset\_id not found in composition\_id

Raise NullArgument - asset\_id or composition\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization fauilure

compliance: mandatory – This method must be implemented.

### **Composition Lookup Methods**

```
Repository.repository_id
```

Gets the Repository Id associated with this session.

Returns the Repository Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

Repository.**repository** 

Gets the Repository associated with this session.

**Returns** the Repository associated with this session

Return type osid.repository.Repository

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# Repository.can\_lookup\_compositions()

Tests if this user can perform Composition lookups.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

Returns false if lookup methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# Repository.use\_comparative\_composition\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

#### Repository.use\_plenary\_composition\_view()

A complete view of the Composition returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory - This method is must be implemented.

# Repository.use\_federated\_repository\_view()

Federates the view for methods in this session.

A federated view will include compositions in repositories which are children of this repository in the repository hierarchy.

compliance: mandatory – This method is must be implemented.

Repository.use\_isolated\_repository\_view() Isolates the view for methods in this session.

An isolated view restricts lookups to this repository only.

compliance: mandatory – This method is must be implemented.

#### Repository.use\_active\_composition\_view()

Only active compositions are returned by methods in this session.

compliance: mandatory – This method is must be implemented.

Repository.use\_any\_status\_composition\_view() All active and inactive compositions are returned by methods in this session.

*compliance: mandatory – This method is must be implemented.* 

Repository.use\_sequestered\_composition\_view() The methods in this session omit sequestered compositions.

compliance: mandatory – This method is must be implemented.

Repository.use\_unsequestered\_composition\_view()

The methods in this session return all compositions, including sequestered compositions.

compliance: mandatory – This method is must be implemented.

# Repository.get\_composition (composition\_id) Gets the Composition specified by its Id.

Parameters composition\_id (osid.id.Id) - Id of the Composiiton

**Returns** the composition

Return type osid.repository.Composition

Raise NotFound - composition\_id not found

Raise NullArgument - composition\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method is must be implemented.

Repository.get\_compositions\_by\_ids (composition\_ids) Gets a CompositionList corresponding to the given IdList.

Parameters composition\_ids (osid.id.IdList) - the list of Ids to retrieve

Returns the returned Composition list

Return type osid.repository.CompositionList

Raise NotFound - an Id was not found

Raise NullArgument - composition\_ids is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

```
Repository.get_compositions_by_genus_type (composition_genus_type)
Gets a CompositionList corresponding to the given composition genus Type which does not
include compositions of types derived from the specified Type.
```

**Parameters composition\_genus\_type** (osid.type.Type) - a composition genus type

Returns the returned Composition list

Return type osid.repository.CompositionList

Raise NullArgument - composition\_genus\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Repository.get\_compositions\_by\_parent\_genus\_type (composition\_genus\_type) Gets a CompositionList corresponding to the given composition genus Type and include any additional compositions with genus types derived from the specified Type.

**Parameters composition\_genus\_type** (osid.type.Type) - a composition genus type

Returns the returned Composition list

Return type osid.repository.CompositionList

Raise NullArgument - composition\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

Repository.get\_compositions\_by\_record\_type (composition\_record\_type) Gets a CompositionList containing the given composition record Type.

Parameters composition\_record\_type (osid.type.Type) - a composition
 record type

Returns the returned Composition list

Return type osid.repository.CompositionList

Raise NullArgument - composition\_record\_type is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Repository.get\_compositions\_by\_provider (*resource\_id*) Gets a CompositionList from the given provider "….

In plenary mode, the returned list contains all known compositions or an error results. Otherwise, the returned list may contain only those compositions that are accessible through this session.

In sequestered mode, no sequestered compositions are returned. In unsequestered mode, all compositions are returned.

Parameters resource\_id (osid.id.Id) - a resource Id

Returns the returned Composition list

Return type osid.repository.CompositionList

**Raise** NullArgument - resource\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Repository.compositions

Gets all Compositions.

Returns a list of Compositions

Return type osid.repository.CompositionList

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# **Composition Query Methods**

```
Repository.repository_id
```

Gets the Repository Id associated with this session.

**Returns** the Repository Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

# Repository.repository

Gets the Repository associated with this session.

Returns the Repository associated with this session

Return type osid.repository.Repository

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Repository.can\_search\_compositions()

Tests if this user can perform Composition searches.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer search operations to unauthorized users.

**Returns** false if search methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

# Repository.use\_federated\_repository\_view()

Federates the view for methods in this session.

A federated view will include compositions in repositories which are children of this repository in the repository hierarchy.

compliance: mandatory - This method is must be implemented.

#### Repository.use\_isolated\_repository\_view()

Isolates the view for methods in this session.

An isolated view restricts lookups to this repository only.

compliance: mandatory – This method is must be implemented.

# Repository.use\_sequestered\_composition\_view()

The methods in this session omit sequestered compositions.

compliance: mandatory – This method is must be implemented.

#### Repository.use\_unsequestered\_composition\_view()

The methods in this session return all compositions, including sequestered compositions.

compliance: mandatory – This method is must be implemented.

# Repository.composition\_query

Gets a composition query.

**Returns** the composition query

Return type osid.repository.CompositionQuery

compliance: mandatory – This method must be implemented.

Repository.get\_compositions\_by\_query (composition\_query) Gets a list of Compositions matching the given composition query.

 $Returns \ the \ returned \ {\tt CompositionList}$ 

Return type osid.repository.CompositionList

Raise NullArgument - composition\_query is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported - composition\_query is not of this service

compliance: mandatory – This method must be implemented.

## **Composition Search Methods**

Repository.composition\_search Gets a composition search.

Returns the composition search

Return type osid.repository.CompositionSearch

compliance: mandatory – This method must be implemented.

#### Repository.composition\_search\_order

Gets a composition search order.

The CompositionSearchOrder is supplied to an CompositionSearch to specify the ordering of results.

**Returns** the composition search order

Return type osid.repository.CompositionSearchOrder

compliance: mandatory – This method must be implemented.

Repository.get\_compositions\_by\_search (*composition\_query*, *composition\_search*) Gets the search results matching the given search query using the given search.

#### Parameters

- composition\_query (osid.repository.CompositionQuery) the composition query
- **composition\_search** (osid.repository.CompositionSearch) the composition search

Returns the composition search results

Return type osid.repository.CompositionSearchResults

Raise NullArgument - composition\_query or composition\_search is
 null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

**Raise** Unsupported-composition\_query or composition\_search is not of this service

compliance: mandatory – This method must be implemented.

Repository.get\_composition\_query\_from\_inspector (*composition\_query\_inspector*) Gets a composition query from an inspector.

The inspector is available from a CompositionSearchResults.

Parameters composition\_query\_inspector(osid.repository.CompositionQueryInspector) - a composition query inspector

**Returns** the composition query

**Return type** osid.repository.CompositionQuery

Raise NullArgument - composition\_query\_inspector is null

Raise Unsupported - composition\_query\_inspector is not of this service

compliance: mandatory – This method must be implemented.

# **Composition Admin Methods**

#### Repository.repository\_id

Gets the Repository Id associated with this session.

Returns the Repository Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

### Repository.repository

Gets the Repository associated with this session.

**Returns** the Repository associated with this session

Return type osid.repository.Repository

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Repository.can\_create\_compositions()

Tests if this user can create Compositions.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating a Composition will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer create operations to unauthorized users.

**Returns** false if Composition creation is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Repository.can\_create\_composition\_with\_record\_types (composition\_record\_types) Tests if this user can create a single Composition using the desired record types.

While RepositoryManager.getCompositionRecordTypes() can be used to examine which records are supported, this method tests which record(s) are required for creating a specific Composition. Providing an empty array tests if a Composition can be created with no records.

**Parameters composition\_record\_types** (osid.type.Type[]) - array of composition record types

**Returns** true if Composition creation using the specified Types is supported, false otherwise

Return type boolean

Raise NullArgument - composition\_record\_types is null

compliance: mandatory – This method must be implemented.

Repository.get\_composition\_form\_for\_create (*composition\_record\_types*) Gets the composition form for creating new compositions.

A new form should be requested for each create transaction.

**Parameters composition\_record\_types** (osid.type.Type[]) - array of composition record types

Returns the composition form

**Return type** osid.repository.CompositionForm

**Raise** NullArgument - composition\_record\_types is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported – unable to get form for requested record types

compliance: mandatory – This method must be implemented.

Repository.create\_composition(composition\_form)

Creates a new Composition.

**Parameters composiiton\_form** (osid.repository.CompositionForm) - the form for this Composition

Returns the new Composition

Return type osid.repository.Composition

Raise IllegalState - composition\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

**Raise** NullArgument - composition\_form is null

Raise OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

**Raise** Unsupported - composition\_form did not originate from get\_composition\_form\_for\_create()

compliance: mandatory – This method must be implemented.

```
Repository.can_update_compositions()
```

Tests if this user can update Compositions.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating a Composition will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer update operations to unauthorized users.

Returns false if Composition modification is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Repository.get\_composition\_form\_for\_update (*composition\_id*) Gets the composition form for updating an existing composition.

A new composition form should be requested for each update transaction.

Parameters composition\_id (osid.id.Id) - the Id of the Composition

**Returns** the composition form

Return type osid.repository.CompositionForm

**Raise** NotFound - composition\_id is not found

Raise NullArgument - composition\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# Repository.update\_composition(composition\_form)

Updates an existing composition.

**Parameters composiiton\_form** (osid.repository.CompositionForm) – the form containing the elements to be updated

Raise IllegalState - composition\_form already used in an update transaction

Raise InvalidArgument - the form contains an invalid value

**Raise** NullArgument - composition\_form is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

**Raise** Unsupported – composition\_form did not originate from get\_composition\_form\_for\_update()

compliance: mandatory – This method must be implemented.

# Repository.can\_delete\_compositions()

Tests if this user can delete Compositions.

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting a Composition will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer delete operations to unauthorized users.

Returns false if Composition deletion is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Repository.delete\_composition(composition\_id)

Deletes a Composition.

Parameters composition\_id (osid.id.Id) - the Id of the Composition to
 remove

**Raise** NotFound – composition\_id not found

**Raise** NullArgument - composition\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented.* 

Repository.delete\_composition\_node (composition\_id) Deletes a Composition and all contained children.

Parameters composition\_id (osid.id.Id) - the Id of the Composition to
 remove

**Raise** NotFound – composition\_id not found

Raise NullArgument - composition\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Repository.add\_composition\_child(composition\_id, child\_composition\_id) Adds a composition to a parent composition.

# Parameters

- composition\_id (osid.id.Id) the Id of a parent Composition
- child\_composition\_id (osid.id.Id) the Id of a child Composition

**Raise** AlreadyExists - child\_composition\_id is already a child of composition\_id

Raise NotFound - composition\_id or child\_composition\_id is not found

Raise NullArgument-composition\_id or child\_composition\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Repository.**remove\_composition\_child** (*composition\_id*, *child\_composition\_id*) Removes a composition from a parent composition.

#### **Parameters**

- composition\_id (osid.id.Id) the Id of a parent Composition
- child\_composition\_id (osid.id.Id) the Id of a child Composition
- **Raise** NotFound composition\_id or child\_composition\_id is not found or not related

Raise NullArgument-composition\_id or child\_composition\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Repository.can\_manage\_composition\_aliases()

Tests if this user can manage Id aliases for Compositions.

A return of true does not guarantee successful authorization. A return of false indicates that it is known changing an alias will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer alias operations to an unauthorized user.

Returns false if Composition aliasing is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Repository.alias\_composition (*composition\_id*, *alias\_id*) Adds an Id to a Composition for the purpose of creating compatibility. The primary Id of the Composition is determined by the provider. The new Id is an alias to the primary Id. If the alias is a pointer to another composition, it is reassigned to the given composition Id.

# Parameters

- composition\_id (osid.id.Id) the Id of a Composition
- alias\_id (osid.id.Id) the alias Id

Raise AlreadyExists - alias\_id is in use as a primary Id

Raise NotFound - composition\_id not found

Raise NullArgument - composition\_id or alias\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# **Composition Repository Methods**

```
Repository.use_comparative_composition_repository_view()
```

The returns from the lookup methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

Repository.use\_plenary\_composition\_repository\_view()

A complete view of the Composition and Repository returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

## Repository.can\_lookup\_composition\_repository\_mappings() Tests if this user can perform lookups of composition/repository mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known lookup methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

Returns false if looking up mappings is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Repository.get\_composition\_ids\_by\_repository (*repository\_id*) Gets the list of Composition Ids associated with a Repository.

**Parameters repository\_id** (osid.id.Id) - Id of the Repository

Returns list of related composition Ids

Return type osid.id.IdList

Raise NotFound - repository\_id is not found

Raise NullArgument - repository\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Repository.get\_compositions\_by\_repository (*repository\_id*) Gets the list of Compositions associated with a Repository.

**Parameters repository\_id** (osid.id.Id) - Id of the Repository

Returns list of related compositions

**Return type** osid.repository.CompositionList

Raise NotFound - repository\_id is not found

Raise NullArgument - repository\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Repository.get\_composition\_ids\_by\_repositories (*repository\_ids*) Gets the list of Composition Ids corresponding to a list of Repository objects.

Parameters repository\_ids (osid.id.IdList) - list of repository Ids

Returns list of composition Ids

Return type osid.id.IdList

**Raise** NullArgument - repository\_ids is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Repository.get\_compoitions\_by\_repositories (repository\_ids)

Gets the list of Compositions corresponding to a list of Repository objects.

Parameters repository\_ids (osid.id.IdList) - list of repository Ids

**Returns** list of Compositions

Return type osid.repository.CompositionList

**Raise** NullArgument - repository\_ids is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Repository.get\_repository\_ids\_by\_composition (*composition\_id*) Gets the Repository Ids mapped to a Composition.

Parameters composition\_id (osid.id.Id) - Id of a Composition

Returns list of repository Ids

Return type osid.id.IdList

Raise NotFound - composition\_id is not found

**Raise** NullArgument - composition\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Repository.get\_repositories\_by\_composition (*composition\_id*) Gets the Repository objects mapped to a Composition.

Parameters composition\_id (osid.id.Id) - Id of a Composition

Returns list of repositories

Return type osid.repository.RepositoryList

Raise NotFound - composition\_id is not found

Raise NullArgument - composition\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### **Composition Repository Assignment Methods**

Repository.can\_assign\_compositions()

Tests if this user can alter composition/repository mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known mapping methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer assignment operations to unauthorized users.

**Returns** false if mapping is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Repository.can\_assign\_compositions\_to\_repository (repository\_id)

Tests if this user can alter composition/repository mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known mapping methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer assignment operations to unauthorized users.

**Parameters repository\_id** (osid.id.Id) - the Id of the Repository

Returns false if mapping is not authorized, true otherwise

Return type boolean

Raise NullArgument - repository\_id is null

compliance: mandatory – This method must be implemented.

Repository.get\_assignable\_repository\_ids (repository\_id)

Gets a list of repositories including and under the given repository node in which any composition can be assigned.

Parameters repository\_id (osid.id.Id) - the Id of the Repository

Returns list of assignable repository Ids

Return type osid.id.IdList

**Raise** NullArgument - repository\_id is null

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

```
Repository.get_assignable_repository_ids_for_composition(repository_id,
```

composition id)

Gets a list of repositories including and under the given repository node in which a specific composition can be assigned.

#### Parameters

- repository\_id (osid.id.Id) the Id of the Repository
- composition\_id (osid.id.Id) the Id of the Composition

Returns list of assignable repository Ids

Return type osid.id.IdList

Raise NullArgument - repository\_id or composition\_id is null

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

Repository.**assign\_composition\_to\_repository** (*composition\_id*, *repository\_id*) Adds an existing Composition to a Repository.

#### **Parameters**

- composition\_id (osid.id.Id) the Id of the Composition
- repository\_id (osid.id.Id) the Id of the Repository

Raise AlreadyExists - composition\_id already assigned to repository\_id

Raise NotFound - composition\_id or repository\_id not found

Raise NullArgument - composition\_id or repository\_id is null

Raise OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented.* 

Repository.unassign\_composition\_from\_repository (composition\_id, reposi-

tory\_id)

Removes Composition from a Repository.

# Parameters

- composition\_id (osid.id.Id) the Id of the Composition
- repository\_id (osid.id.Id) the Id of the Repository

**Raise** NotFound - composition\_id or repository\_id not found or composition\_id not assigned to repository\_id

**Raise** NullArgument - composition\_id or repository\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# **Objects**

# Asset

# class dlkit.repository.objects.Asset

Bases: dlkit.osid.objects.OsidObject, dlkit.osid.markers.Aggregateable, dlkit. osid.markers.Sourceable

An Asset represents some digital content.

Example assets might be a text document, an image, or a movie. The content data, and metadata related directly to the content format and quality, is accessed through <code>AssetContent</code>. Assets, like all <code>OsidObjects</code>, include a type a record to qualify the <code>Asset</code> and include additional data. The division between the <code>Asset</code> Type and <code>AssetContent</code> is to separate data describing the asset from data describing the format of the contents, allowing a consumer to select among multiple formats, sizes or levels of fidelity.

An example is a photograph of the Bay Bridge. The content may deliver a JPEG in multiple resolutions where the AssetContent may also desribe size or compression factor for each one. The content may also include an uncompressed TIFF version. The Asset Type may be "photograph" indicating that the photo itself is the asset managed in this repository.

Since an Asset may have multiple AssetContent structures, the decision of how many things to stuff inside a single asset comes down to if the content is actually a different format, or size, or quality, falling under the same creator, copyright, publisher and distribution rights as the original. This may, in some cases, provide a means to implement some accessibility, it doesn't handle the case where, to meet an accessibility requirement, one asset needs to be substituted for another. The Repository OSID manages this aspect outside the scope of the core Asset definition.

Assets map to AssetSubjects. AssetSubjects are OsidObjects that capture a subject matter. In the above example, an AssetSubject may be defined for the Bay Bridge and include data describing the bridge. The single subject can map to multiple assets depicting the bridge providing a single entry for a search and a single place to describe a bridge. Bridges, as physical items, may also be described using the Resource OSID in which case the use of the AssetSubject acts as a cover for the underlying Resource to assist repository-only consumers.

The Asset definition includes some basic copyright and related licensing information to assist in finding freeto-use content, or to convey the distribution restrictions that may be placed on the asset. Generally, if no data is available it is to be assumed that all rights are reserved.

A publisher is applicable if the content of this Asset has been published. Not all Assets in this Repository may have a published status and such a status may effect the applicability of copyright law. To trace the source of an Asset, both a provider and source are defined. The provider indicates where this repository acquired the asset and the source indicates the original provider or copyright owner. In the case of a published asset, the source is the publisher.

Assets also define methods to facilitate searches over time and space as it relates to the subject matter. This may at times be redundant with the AssetSubject. In the case of the Bay Bridge photograph, the temporal coverage may include 1936, when it opened, and/or indicate when the photo was taken to capture a current event of the bridge. The decision largeley depends on what desired effect is from a search. The spatial coverage may describe the gps coordinates of the bridge or describe the spatial area encompassed in the view. In either case, a "photograph" type may unambiguously defined methods to describe the exact time the photograph was taken and the location of the photographer.

The core Asset defines methods to perform general searches and construct bibliographic entries without knowledge of a particular Asset or AssetContent record Type.

#### title

Gets the proper title of this asset.

This may be the same as the display name or the display name may be used for a less formal label.

**Returns** the title of this asset

**Return type** osid.locale.DisplayText

compliance: mandatory – This method must be implemented.

# is\_copyright\_status\_known()

Tests if the copyright status is known.

can\_distribute\_compositions()" may also be false.

rtype boolean

compliance: mandatory – This method must be implemented.

# is\_public\_domain()

Tests if this asset is in the public domain.

An asset is in the public domain if copyright is not applicable, the copyright has expired, or the copyright owner has expressly relinquished the copyright.

Returns true if this asset is in the public domain, false otherwise. If true, can\_distribute\_verbatim(), can\_distribute\_alterations() and can\_distribute\_compositions() must also be true.

Return type boolean

**Raise** IllegalState - is\_copyright\_status\_known() is false

compliance: mandatory – This method must be implemented.

#### copyright\_

Gets the copyright statement and of this asset which identifies the current copyright holder.

For an asset in the public domain, this method may return the original copyright statement although it may be no longer valid.

**Returns** the copyright statement or an empty string if none available. An empty string does not imply the asset is not protected by copyright.

Return type osid.locale.DisplayText

**Raise** IllegalState - is\_copyright\_status\_known() is false

compliance: mandatory – This method must be implemented.

#### copyright\_registration

Gets the copyright registration information for this asset.

**Returns** the copyright registration. An empty string means the registration status isn't known.

Return type string

Raise IllegalState-is\_copyright\_status\_known() is false

compliance: mandatory – This method must be implemented.

#### can\_distribute\_verbatim()

Tests if there are any license restrictions on this asset that restrict the distribution, re-publication or public display of this asset, commercial or otherwise, without modification, alteration, or inclusion in other works.

This method is intended to offer consumers a means of filtering out search results that restrict distribution for any purpose. The scope of this method does not include licensing that describes warranty disclaimers or attribution requirements. This method is intended for informational purposes only and does not replace or override the terms specified in a license agreement which may specify exceptions or additional restrictions.

Returns true if the asset can be distributed verbatim, false otherwise.

Return type boolean

**Raise** IllegalState - is\_copyright\_status\_known() is false

compliance: mandatory – This method must be implemented.

# can\_distribute\_alterations()

Tests if there are any license restrictions on this asset that restrict the distribution, re-publication or public display of any alterations or modifications to this asset, commercial or otherwise, for any purpose.

This method is intended to offer consumers a means of filtering out search results that restrict the distribution or public display of any modification or alteration of the content or its metadata of any kind, including editing, translation, resampling, resizing and cropping. The scope of this method does not include licensing that describes warranty disclaimers or attribution requirements. This method is intended for informational purposes only and does not replace or override the terms specified in a license agreement which may specify exceptions or additional restrictions.

**Returns** true if the asset can be modified, false otherwise. If true, can\_distribute\_verbatim() must also be true.

Return type boolean

**Raise** IllegalState - is\_copyright\_status\_known() is false

compliance: mandatory - This method must be implemented.

#### can\_distribute\_compositions()

Tests if there are any license restrictions on this asset that restrict the distribution, re-publication or public display of this asset as an inclusion within other content or composition, commercial or otherwise, for any purpose, including restrictions upon the distribution or license of the resulting composition.

This method is intended to offer consumers a means of filtering out search results that restrict the use of this asset within compositions. The scope of this method does not include licensing that describes warranty disclaimers or attribution requirements. This method is intended for informational purposes only and does not replace or override the terms specified in a license agreement which may specify exceptions or additional restrictions.

**Returns** true if the asset can be part of a larger composition false otherwise. If true, can\_distribute\_verbatim() must also be true.

Return type boolean

Raise IllegalState-is\_copyright\_status\_known() is false

compliance: mandatory – This method must be implemented.

#### source\_id

Gets the Resource Id of the source of this asset.

The source is the original owner of the copyright of this asset and may differ from the creator of this asset. The source for a published book written by Margaret Mitchell would be Macmillan. The source for an unpublished painting by Arthur Goodwin would be Arthur Goodwin.

An Asset is Sourceable and also contains a provider identity. The provider is the entity that makes this digital asset available in this repository but may or may not be the publisher of the contents depicted in the asset. For example, a map published by Ticknor and Fields in 1848 may have a provider of Library of Congress and a source of Ticknor and Fields. If copied from a repository at Middlebury College, the provider would be Middlebury College and a source of Ticknor and Fields.

Returns the source Id

Return type osid.id.Id

compliance: mandatory - This method must be implemented.

#### source

Gets the Resource of the source of this asset.

The source is the original owner of the copyright of this asset and may differ from the creator of this asset. The source for a published book written by Margaret Mitchell would be Macmillan. The source for an unpublished painting by Arthur Goodwin would be Arthur Goodwin.

**Returns** the source

Return type osid.resource.Resource

compliance: mandatory – This method must be implemented.

#### provider\_link\_ids

Gets the resource Ids representing the source of this asset in order from the most recent provider to the originating source.

**Returns** the provider Ids

Return type osid.id.IdList

compliance: mandatory – This method must be implemented.

### provider\_links

Gets the Resources representing the source of this asset in order from the most recent provider to the originating source.

**Returns** the provider chain

**Return type** osid.resource.ResourceList

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

## created\_date

Gets the created date of this asset, which is generally not related to when the object representing the asset was created.

The date returned may indicate that not much is known.

Returns the created date

Return type osid.calendaring.DateTime

compliance: mandatory – This method must be implemented.

### is\_published()

Tests if this asset has been published.

Not all assets viewable in this repository may have been published. The source of a published asset indicates the publisher.

**Returns** true if this asset has been published, false if unpublished or its published status is not known

Return type boolean

compliance: mandatory – This method must be implemented.

#### published\_date

Gets the published date of this asset.

Unpublished assets have no published date. A published asset has a date available, however the date returned may indicate that not much is known.

Returns the published date

**Return type** osid.calendaring.DateTime

**Raise** IllegalState - is\_published() is false

compliance: mandatory – This method must be implemented.

### principal\_credit\_string

Gets the credits of the principal people involved in the production of this asset as a display string.

**Returns** the principal credits

Return type osid.locale.DisplayText

compliance: mandatory – This method must be implemented.

## asset\_content\_ids

Gets the content Ids of this asset.

Returns the asset content Ids

Return type osid.id.IdList

compliance: mandatory – This method must be implemented.

### asset\_contents

Gets the content of this asset.

**Returns** the asset contents

Return type osid.repository.AssetContentList

**Raise** OperationFailed – unable to complete request

*compliance: mandatory – This method must be implemented.* 

#### is\_composition()

Tetss if this asset is a representation of a composition of assets.

**Returns** true if this asset is a composition, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### composition\_id

Gets the Composition Id corresponding to this asset.

Returns the composiiton Id

Return type osid.id.Id

Raise IllegalState - is\_composition() is false

#### composition

Gets the Composition corresponding to this asset.

Returns the composiiton

Return type osid.repository.Composition

**Raise** IllegalState - is\_composition() is false

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

## get\_asset\_record (asset\_record\_type)

Gets the asset record corresponding to the given Asset record Type.

This method is used to retrieve an object implementing the requested record. The asset\_record\_type may be the Type returned in get\_record\_types () or any of its parents in a Type hierarchy where has\_record\_type (asset\_record\_type) is true.

**Parameters asset\_record\_type** (osid.type.Type) - an asset record type

Returns the asset record

Return type osid.repository.records.AssetRecord

**Raise** NullArgument - asset\_record\_type is null

**Raise** OperationFailed – unable to complete request

**Raise** Unsupported - has\_record\_type (asset\_record\_type) is false

compliance: mandatory – This method must be implemented.

### Asset Form

class dlkit.repository.objects.AssetForm

Bases: dlkit.osid.objects.OsidObjectForm, dlkit.osid.objects. OsidAggregateableForm, dlkit.osid.objects.OsidSourceableForm

This is the form for creating and updating Assets.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the AssetAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

### title\_metadata

Gets the metadata for an asset title.

Returns metadata for the title

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

#### title

#### public\_domain\_metadata

Gets the metadata for the public domain flag.

**Returns** metadata for the public domain

Return type osid.Metadata

public\_domain

#### copyright\_metadata

Gets the metadata for the copyright.

**Returns** metadata for the copyright

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

## copyright\_

## copyright\_registration\_metadata

Gets the metadata for the copyright registration.

Returns metadata for the copyright registration

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

#### copyright\_registration

### distribute\_verbatim\_metadata

Gets the metadata for the distribute verbatim rights flag.

**Returns** metadata for the distribution rights fields

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

#### distribute\_verbatim

### distribute\_alterations\_metadata

Gets the metadata for the distribute alterations rights flag.

Returns metadata for the distribution rights fields

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

#### distribute\_alterations

#### distribute\_compositions\_metadata

Gets the metadata for the distribute compositions rights flag.

Returns metadata for the distribution rights fields

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

#### distribute\_compositions

### source\_metadata

Gets the metadata for the source.

Returns metadata for the source

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

#### source

#### provider\_links\_metadata

Gets the metadata for the provider chain.

Returns metadata for the provider chain

Return type osid.Metadata

*compliance: mandatory – This method must be implemented.* 

### provider\_links

## created\_date\_metadata

Gets the metadata for the asset creation date.

**Returns** metadata for the created date

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

## created\_date

### published\_metadata

Gets the metadata for the published status.

Returns metadata for the published field

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

## published

### published\_date\_metadata

Gets the metadata for the published date.

**Returns** metadata for the published date

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

## published\_date

#### principal\_credit\_string\_metadata

Gets the metadata for the principal credit string.

Returns metadata for the credit string

Return type osid.Metadata

*compliance: mandatory – This method must be implemented.* 

### principal\_credit\_string

#### composition\_metadata

Gets the metadata for linking this asset to a composition.

**Returns** metadata for the composition

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

### composition

#### get\_asset\_form\_record(asset\_record\_type)

Gets the AssetFormRecord corresponding to the given Asset record Type.

Parameters asset\_record\_type (osid.type.Type) - an asset record type
Returns the asset form record
Return type osid.repository.records.AssetFormRecord
Raise NullArgument - asset\_record\_type is null
Raise OperationFailed - unable to complete request
Raise Unsupported - has\_record\_type (asset\_record\_type) is false
compliance: mandatory - This method must be implemented.

## **Asset List**

```
class dlkit.repository.objects.AssetList
    Bases: dlkit.osid.objects.OsidList
```

Like all OsidLists, AssetList provides a means for accessing Asset elements sequentially either one at a time or many at a time.

Examples: while (al.hasNext()) { Asset asset = al.getNextAsset(); }

#### or

while (al.hasNext()) { Asset[] assets = al.getNextAssets(al.available());

### }

### next\_asset

Gets the next Asset in this list.

**Returns** the next Asset in this list. The has\_next() method should be used to test that a next Asset is available before calling this method.

Return type osid.repository.Asset

**Raise** IllegalState – no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

## get\_next\_assets(n)

Gets the next set of Assets in this list which must be less than or equal to the return from available().

Parameters n (cardinal) - the number of Asset elements requested which must be less
than or equal to available()

**Returns** an array of Asset elements. The length of the array is less than or equal to the number specified.

Return type osid.repository.Asset

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

## **Asset Content**

class dlkit.repository.objects.AssetContent

Bases: dlkit.osid.objects.OsidObject, dlkit.osid.markers.Subjugateable

AssetContent represents a version of content represented by an Asset.

Although AssetContent is a separate OsidObject with its own Id to distuinguish it from other content inside an Asset, AssetContent can only be accessed through an Asset.

Once an Asset is selected, multiple contents should be negotiated using the size, fidelity, accessibility requirements or application evnironment.

#### asset\_id

Gets the Asset Id corresponding to this content.

Returns the asset  ${\tt Id}$ 

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### asset

Gets the Asset corresponding to this content.

**Returns** the asset

Return type osid.repository.Asset

compliance: mandatory – This method must be implemented.

#### accessibility\_types

Gets the accessibility types associated with this content.

Returns list of content accessibility types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

### has\_data\_length()

Tests if a data length is available.

**Returns** true if a length is available for this content, false otherwise.

Return type boolean

compliance: mandatory – This method must be implemented.

## data\_length

Gets the length of the data represented by this content in bytes.

**Returns** the length of the data stream

Return type cardinal

**Raise** IllegalState - has\_data\_length() is false

compliance: mandatory – This method must be implemented.

#### data

Gets the asset content data.

Returns the length of the content data

Return type osid.transport.DataInputStream

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

has\_url()

Tests if a URL is associated with this content.

Returns true if a URL is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

url

Gets the URL associated with this content for web-based retrieval.

**Returns** the url for this data

Return type string

Raise IllegalState - has\_url() is false

compliance: mandatory – This method must be implemented.

get\_asset\_content\_record (asset\_content\_content\_record\_type)
Gets the asset content record corresponding to the given AssetContent record Type.

This method is used to retrieve an object implementing the requested record. The asset\_record\_type may be the Type returned in get\_record\_types () or any of its parents in a Type hierarchy where has\_record\_type (asset\_record\_type) is true.

**Parameters asset\_content\_content\_record\_type**(osid.type.Type)-the type of the record to retrieve

Returns the asset content record

Return type osid.repository.records.AssetContentRecord

**Raise** NullArgument - asset\_content\_record\_type is null

**Raise** OperationFailed – unable to complete request

Raise Unsupported - has\_record\_type(asset\_content\_record\_type) is
false

compliance: mandatory – This method must be implemented.

## **Asset Content Form**

class dlkit.repository.objects.AssetContentForm

Bases:dlkit.osid.objects.OsidObjectForm,dlkit.osid.objects.OsidSubjugateableForm

This is the form for creating and updating content for AssetContent.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the AssetAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

accessibility\_type\_metadata

Gets the metadata for an accessibility type.

**Returns** metadata for the accessibility types

Return type osid.Metadata

# add\_accessibility\_type (accessibility\_type) Adds on accessibility type)

Adds an accessibility type.

Multiple types can be added.

Parameters accessibility\_type (osid.type.Type) - a new accessibility type

**Raise** InvalidArgument - accessibility\_type is invalid

**Raise** NoAccess - Metadata.isReadOnly() is true

**Raise** NullArgument - accessibility\_t\_ype is null

compliance: mandatory - This method must be implemented.

#### remove\_accessibility\_type (accessibility\_type)

Removes an accessibility type.

**Parameters accessibility\_type** (osid.type.Type) – accessibility type to remove

Raise NoAccess - Metadata.isReadOnly() is true

**Raise** NotFound – acessibility type not found

**Raise** NullArgument - accessibility\_type is null

compliance: mandatory – This method must be implemented.

## accessibility\_types

#### data\_metadata

Gets the metadata for the content data.

Returns metadata for the content data

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

#### data

#### url\_metadata

Gets the metadata for the url.

Returns metadata for the url

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

## url

#### get\_asset\_content\_form\_record (asset\_content\_record\_type)

Gets the AssetContentFormRecord corresponding to the given asset content record Type.

Parameters asset\_content\_record\_type (osid.type.Type) - an asset content record type

**Returns** the asset content form record

Return type osid.repository.records.AssetContentFormRecord

**Raise** NullArgument - asset\_content\_record\_type is null

Raise OperationFailed - unable to complete request

Raise Unsupported - has\_record\_type(asset\_content\_record\_type) is
false

compliance: mandatory – This method must be implemented.

## **Asset Content List**

class dlkit.repository.objects.AssetContentList

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, AssetContentList provides a means for accessing AssetContent elements sequentially either one at a time or many at a time.

Examples: while (acl.hasNext()) { AssetContent content = acl.getNextAssetContent(); }

or

while (acl.hasNext()) { AssetContent[] contents = acl.getNextAssetContents(acl.available());

}

### next\_asset\_content

Gets the next AssetContent in this list.

**Returns** the next AssetContent in this list. The has\_next() method should be used to test that a next AssetContent is available before calling this method.

Return type osid.repository.AssetContent

**Raise** IllegalState – no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

#### get\_next\_asset\_contents(n)

Gets the next set of AssetContents in this list which must be less than or equal to the return from available().

Parameters n (cardinal) - the number of AssetContent elements requested which must be less than or equal to available()

**Returns** an array of AssetContent elements. The length of the array is less than or equal to the number specified.

Return type osid.repository.AssetContent

Raise IllegalState - no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

## Composition

class dlkit.repository.objects.Composition

**Bases:** dlkit.osid.objects.OsidObject, dlkit.osid.markers.Containable, dlkit. osid.markers.Operable, dlkit.osid.markers.Sourceable

A Composition represents an authenticatable identity.

Like all OSID objects, a Composition is identified by its Id and any persisted references should use the Id.

#### children\_ids

Gets the child Ids of this composition.

Returns the composition child Ids

Return type osid.id.IdList

compliance: mandatory – This method must be implemented.

### children

Gets the children of this composition.

**Returns** the composition children

Return type osid.repository.CompositionList

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

#### get\_composition\_record (composition\_record\_type)

Gets the composition record corresponding to the given Composition record Type.

This method is used to retrieve an object implementing the requested record. The composition\_record\_type may be the Type returned in get\_record\_types() or any of its parents in a Type hierarchy where has\_record\_type(composition\_record\_type) is true.

Parameters composition\_record\_type (osid.type.Type) - a composition record
type

Returns the composition record

Return type osid.repository.records.CompositionRecord

**Raise** NullArgument - composition\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type (composition\_record\_type) is false

compliance: mandatory – This method must be implemented.

#### **Composition Form**

class dlkit.repository.objects.CompositionForm

Bases: dlkit.osid.objects.OsidObjectForm, dlkit.osid.objects. OsidContainableForm, dlkit.osid.objects.OsidOperableForm, dlkit.osid. objects.OsidSourceableForm

This is the form for creating and updating Compositions.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the CompositionAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

## get\_composition\_form\_record (composition\_record\_type)

Gets the CompositionFormRecord corresponding to the given repository record Type.

Parameters composition\_record\_type (osid.type.Type) - a composition record
type

**Returns** the composition form record

Return type osid.repository.records.CompositionFormRecord

**Raise** NullArgument - composition\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type (composition\_record\_type) is false compliance: mandatory - This method must be implemented.

## **Composition List**

```
class dlkit.repository.objects.CompositionList
    Bases: dlkit.osid.objects.OsidList
```

Like all OsidLists, CompositionList provides a means for accessing Composition elements sequentially either one at a time or many at a time.

Examples: while (cl.hasNext()) { Composition composition = cl.getNextComposition(); }

or

**while** (cl.hasNext()) { Composition[] compositions = cl.getNextCompositions(cl.available());

}

#### next\_composition

Gets the next Composition in this list.

**Returns** the next Composition in this list. The has\_next() method should be used to test that a next Composition is available before calling this method.

Return type osid.repository.Composition

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

#### get\_next\_compositions(n)

Gets the next set of Composition elements in this list which must be less than or equal to the return from available().

- Parameters n (cardinal) the number of Composition elements requested which must be less than or equal to available()
- **Returns** an array of Composition elements. The length of the array is less than or equal to the number specified.

Return type osid.repository.Composition

**Raise** IllegalState – no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

#### Repository

class dlkit.repository.objects.Repository (abc\_repository\_objects.Repository,

osid\_objects.OsidCatalog)

## :noindex:

```
get_repository_record (repository_record_type)
Gets the record corresponding to the given Repository record Type.
```

This method is used to retrieve an object implementing the requested record. The repository\_record\_type may be the Type returned in get\_record\_types() or any of its parents in a Type hierarchy where has\_record\_type (repository\_record\_type) is true

Parameters repository\_record\_type (osid.type.Type) - a repository record type

Returns the repository record

Return type osid.repository.records.RepositoryRecord

Raise NullArgument - repository\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type (repository\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Repository Form**

class dlkit.repository.objects.RepositoryForm Bases: dlkit.osid.objects.OsidCatalogForm

This is the form for creating and updating repositories.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the RepositoryAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

## get\_repository\_form\_record (repository\_record\_type)

Gets the RepositoryFormRecord corresponding to the given repository record Type.

**Parameters repository\_record\_type** (osid.type.Type) - a repository record type

Returns the repository form record

Return type osid.repository.records.RepositoryFormRecord

Raise NullArgument - repository\_record\_type is null

**Raise** OperationFailed – unable to complete request

**Raise** Unsupported - has\_record\_type (repository\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Repository List**

```
class dlkit.repository.objects.RepositoryList
    Bases: dlkit.osid.objects.OsidList
```

Like all OsidLists, RepositoryList provides a means for accessing Repository elements sequen-

tially either one at a time or many at a time.

Examples: while (rl.hasNext()) { Repository repository = rl.getNextRepository(); }

or

```
while (rl.hasNext()) { Repository[] repositories = rl.getNextRepositories(rl.available());
```

}

#### next\_repository

Gets the next Repository in this list.

**Returns** the next Repository in this list. The has\_next() method should be used to test that a next Repository is available before calling this method.

Return type osid.repository.Repository

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

### get\_next\_repositories(n)

Gets the next set of Repository elements in this list which must be less than or equal to the return from available().

- **Parameters n** (cardinal) the number of Repository elements requested which must be less than or equal to available()
- **Returns** an array of Repository elements. The length of the array is less than or equal to the number specified.

Return type osid.repository.Repository

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

## **Repository Node**

class dlkit.repository.objects.RepositoryNode

Bases: dlkit.osid.objects.OsidNode

This interface is a container for a partial hierarchy retrieval.

The number of hierarchy levels traversable through this interface depend on the number of levels requested in the RepositoryHierarchySession.

#### repository

Gets the Repository at this node.

**Returns** the repository represented by this node

Return type osid.repository.Repository

compliance: mandatory – This method must be implemented.

## parent\_repository\_nodes

Gets the parents of this repository.

Returns the parents of the id

Return type osid.repository.RepositoryNodeList

compliance: mandatory – This method must be implemented.

### child\_repository\_nodes

Gets the children of this repository.

Returns the children of this repository

Return type osid.repository.RepositoryNodeList

compliance: mandatory – This method must be implemented.

## **Repository Node List**

class dlkit.repository.objects.RepositoryNodeList

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, RepositoryNodeList provides a means for accessing RepositoryNode elements sequentially either one at a time or many at a time.

Examples: while (rnl.hasNext()) { RepositoryNode node = rnl.getNextRepositoryNode(); }

or

while (rnl.hasNext()) { RepositoryNode[] nodes = rnl.getNextRepositoryNodes(rnl.available());

}

### next\_repository\_node

Gets the next RepositoryNode in this list.

**Returns** the next RepositoryNode in this list. The has\_next() method should be used to test that a next RepositoryNode is available before calling this method.

Return type osid.repository.RepositoryNode

**Raise** IllegalState – no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

### get\_next\_repository\_nodes (n)

Gets the next set of RepositoryNode elements in this list which must be less than or equal to the return from available().

**Parameters n** (cardinal) – the number of RepositoryNode elements requested which must be less than or equal to available ()

**Returns** an array of RepositoryNode elements. The length of the array is less than or equal to the number specified.

Return type osid.repository.RepositoryNode

**Raise** IllegalState – no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

# Queries

### Asset Query

class dlkit.repository.queries.AssetQuery

Bases: dlkit.osid.queries.OsidObjectQuery, dlkit.osid.queries. OsidAggregateableQuery, dlkit.osid.queries.OsidSourceableQuery

This is the query for searching assets.

Each method specifies an AND term while multiple invocations of the same method produce a nested OR. The query record is identified by the Asset Type.

match\_title (title, string\_match\_type, match)
Adds a title for this query.

#### **Parameters**

- title (string) title string to match
- string\_match\_type (osid.type.Type) the string match type
- match (boolean) true for a positive match, false for a negative match
- **Raise** InvalidArgument title not of string\_match\_type

Raise NullArgument - title or string\_match\_type is null

Raise Unsupported - supports\_string\_match\_type(string\_match\_type) is
 false

compliance: mandatory – This method must be implemented.

### match\_any\_title(match)

Matches a title that has any value.

**Parameters match** (boolean) - true to match assets with any title, false to match assets with no title

compliance: mandatory – This method must be implemented.

## title\_terms

match\_public\_domain(public\_domain)

Matches assets marked as public domain.

Parameters public\_domain (boolean) - public domain flag

compliance: mandatory – This method must be implemented.

### match\_any\_public\_domain(match)

Matches assets with any public domain value.

**Parameters match** (boolean) - true to match assets with any public domain value, false to match assets with no public domain value

compliance: mandatory – This method must be implemented.

#### public\_domain\_terms

match\_copyright (copyright\_, string\_match\_type, match)
Adds a copyright for this query.

#### **Parameters**

- copyright (string) copyright string to match
- string\_match\_type (osid.type.Type) the string match type
- match (boolean) true for a positive match, false for a negative match

Raise InvalidArgument - copyright not of string\_match\_type

Raise NullArgument - copyright or string\_match\_type is null

Raise Unsupported - supports\_string\_match\_type(string\_match\_type) is
false

match\_any\_copyright (match)

Matches assets with any copyright statement.

**Parameters match** (boolean) - true to match assets with any copyright value, false to match assets with no copyright value

compliance: mandatory – This method must be implemented.

## copyright\_terms

match\_copyright\_registration (registration, string\_match\_type, match)
Adds a copyright registration for this query.

## Parameters

- registration (string) copyright registration string to match
- string\_match\_type (osid.type.Type) the string match type
- match (boolean) true for a positive match, false for a negative match

**Raise** InvalidArgument - registration not of string\_match\_type

Raise NullArgument - registration or string\_match\_type is null

Raise Unsupported - supports\_string\_match\_type(string\_match\_type) is
 false

compliance: mandatory – This method must be implemented.

## match\_any\_copyright\_registration (match)

Matches assets with any copyright registration.

**Parameters match** (boolean) – true to match assets with any copyright registration value, false to match assets with no copyright registration value

compliance: mandatory – This method must be implemented.

#### copyright\_registration\_terms

match\_distribute\_verbatim(distributable)
Matches assets marked as distributable.

viatenes assets marked as distributable.

Parameters distributable (boolean) - distribute verbatim rights flag

compliance: mandatory – This method must be implemented.

### distribute\_verbatim\_terms

match\_distribute\_alterations(alterable)

Matches assets that whose alterations can be distributed.

Parameters alterable (boolean) – distribute alterations rights flag

compliance: mandatory – This method must be implemented.

### distribute\_alterations\_terms

#### match\_distribute\_compositions(composable)

Matches assets that can be distributed as part of other compositions.

Parameters composable (boolean) - distribute compositions rights flag

compliance: mandatory – This method must be implemented.

#### distribute\_compositions\_terms

match\_source\_id (source\_id, match)
 Sets the source Id for this query.

#### **Parameters**

- source\_id (osid.id.Id) the source Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - source\_id is null

compliance: mandatory – This method must be implemented.

## source\_id\_terms

#### supports\_source\_query()

Tests if a ResourceQuery is available for the source.

**Returns** true if a resource query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### source\_query

Gets the query for the source.

Multiple queries can be retrieved for a nested OR term.

**Returns** the source query

Return type osid.resource.ResourceQuery

**Raise** Unimplemented - supports\_source\_query() is false

compliance: optional – This method must be implemented if "supports\_source\_query()" is "true".

#### match\_any\_source(match)

Matches assets with any source.

**Parameters match** (boolean) – true to match assets with any source, false to match assets with no sources

compliance: mandatory – This method must be implemented.

## source\_terms

## match\_created\_date(start, end, match)

Match assets that are created between the specified time period.

#### **Parameters**

- **start** (osid.calendaring.DateTime) start time of the query
- end (osid.calendaring.DateTime) end time of the query
- match (boolean) true for a positive match, false for a negative match

Raise InvalidArgument - end is les than start

Raise NullArgument - start or end is null

compliance: mandatory – This method must be implemented.

## match\_any\_created\_date(match)

Matches assets with any creation time.

**Parameters match** (boolean) – true to match assets with any created time, false to match assets with no cerated time

compliance: mandatory – This method must be implemented.

#### created\_date\_terms

match\_published(published)

Marks assets that are marked as published.

Parameters published (boolean) - published flag

compliance: mandatory – This method must be implemented.

## published\_terms

### match\_published\_date(start, end, match)

Match assets that are published between the specified time period.

### **Parameters**

- **start** (osid.calendaring.DateTime) start time of the query
- end (osid.calendaring.DateTime) end time of the query
- match (boolean) true for a positive match, false for a negative match

Raise InvalidArgument - end is les than start

**Raise** NullArgument - start or end is null

compliance: mandatory – This method must be implemented.

## match\_any\_published\_date(match)

Matches assets with any published time.

**Parameters match** (boolean) - true to match assets with any published time, false to match assets with no published time

compliance: mandatory – This method must be implemented.

#### published\_date\_terms

match\_principal\_credit\_string (credit, string\_match\_type, match)
Adds a principal credit string for this query.

#### **Parameters**

- credit (string) credit string to match
- string\_match\_type (osid.type.Type) the string match type
- match (boolean) true for a positive match, false for a negative match

**Raise** InvalidArgument - credit not of string\_match\_type

**Raise** NullArgument - credit or string\_match\_type is null

Raise Unsupported - supports\_string\_match\_type(string\_match\_type) is
false

compliance: mandatory – This method must be implemented.

## match\_any\_principal\_credit\_string(match)

Matches a principal credit string that has any value.

**Parameters match** (boolean) – true to match assets with any principal credit string, false to match assets with no principal credit string

compliance: mandatory – This method must be implemented.

## principal\_credit\_string\_terms

#### match\_temporal\_coverage (start, end, match)

Match assets that whose coverage falls between the specified time period inclusive.

#### **Parameters**

- **start** (osid.calendaring.DateTime) start time of the query
- **end** (osid.calendaring.DateTime) **end** time of the query
- match (boolean) true for a positive match, false for a negative match

Raise InvalidArgument - end is less than start

Raise NullArgument - start or end is null

compliance: mandatory – This method must be implemented.

#### match\_any\_temporal\_coverage(match)

Matches assets with any temporal coverage.

**Parameters match** (boolean) – true to match assets with any temporal coverage, false to match assets with no temporal coverage

compliance: mandatory – This method must be implemented.

## temporal\_coverage\_terms

match\_location\_id(location\_id, match)

Sets the location Id for this query of spatial coverage.

#### **Parameters**

- location\_id (osid.id.Id) the location Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - location\_id is null

compliance: mandatory – This method must be implemented.

### location\_id\_terms

#### supports\_location\_query()

Tests if a LocationQuery is available for the provider.

**Returns** true if a location query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### location\_query

Gets the query for a location.

Multiple queries can be retrieved for a nested OR term.

**Returns** the location query

Return type osid.mapping.LocationQuery

Raise Unimplemented - supports\_location\_query() is false

compliance: optional – This method must be implemented if "supports\_location\_query()" is "true".

### match\_any\_location(match)

Matches assets with any provider.

**Parameters match** (boolean) - true to match assets with any location, false to match assets with no locations

compliance: mandatory – This method must be implemented.

#### location\_terms

match\_spatial\_coverage(spatial\_unit, match)

Matches assets that are contained within the given spatial unit.

#### Parameters

- **spatial\_unit** (osid.mapping.SpatialUnit) the spatial unit
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - spatial\_unit is null

**Raise** Unsupported – spatial\_unit is not suppoted

compliance: mandatory – This method must be implemented.

#### spatial\_coverage\_terms

match\_spatial\_coverage\_overlap(spatial\_unit, match)

Matches assets that overlap or touch the given spatial unit.

#### Parameters

- **spatial\_unit** (osid.mapping.SpatialUnit) the spatial unit
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - spatial\_unit is null

Raise Unsupported - spatial\_unit is not suppoted

compliance: mandatory – This method must be implemented.

#### match\_any\_spatial\_coverage(match)

Matches assets with no spatial coverage.

**Parameters match** (boolean) – true to match assets with any spatial coverage, false to match assets with no spatial coverage

compliance: mandatory – This method must be implemented.

### spatial\_coverage\_overlap\_terms

match\_asset\_content\_id(asset\_content\_id, match)

Sets the asset content Id for this query.

### Parameters

- asset\_content\_id (osid.id.Id) the asset content Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - asset\_content\_id is null

compliance: mandatory – This method must be implemented.

### asset\_content\_id\_terms

#### supports\_asset\_content\_query()

Tests if an AssetContentQuery is available.

Returns true if an asset content query is available, false otherwise

Return type boolean

#### asset\_content\_query

Gets the query for the asset content.

Multiple queries can be retrieved for a nested OR term.

Returns the asset contents query

**Return type** osid.repository.AssetContentQuery

**Raise** Unimplemented - supports\_asset\_content\_query() is false

compliance: optional – This method must be implemented if "supports\_asset\_content\_query()" is "true".

## match\_any\_asset\_content (match)

Matches assets with any content.

**Parameters match** (boolean) – true to match assets with any content, false to match assets with no content

compliance: mandatory – This method must be implemented.

#### asset\_content\_terms

match\_composition\_id (composition\_id, match)

Sets the composition Id for this query to match assets that are a part of the composition.

#### **Parameters**

- composition\_id (osid.id.Id) the composition Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - composition\_id is null

compliance: mandatory – This method must be implemented.

#### composition\_id\_terms

#### supports\_composition\_query()

Tests if a CompositionQuery is available.

**Returns** true if a composition query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### composition\_query

Gets the query for a composition.

Multiple queries can be retrieved for a nested OR term.

Returns the composition query

Return type osid.repository.CompositionQuery

Raise Unimplemented - supports\_composition\_query() is false

compliance: optional – This method must be implemented if "supports\_composition\_query()" is "true".

#### match\_any\_composition (match)

Matches assets with any composition mappings.

**Parameters match** (boolean) – true to match assets with any composition, false to match assets with no composition mappings

compliance: mandatory – This method must be implemented.

composition\_terms

match\_repository\_id(repository\_id, match) Sets the repository Id for this query.

- **Parameters** 
  - repository\_id (osid.id.Id) the repository Id
  - match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - repository\_id is null

compliance: mandatory – This method must be implemented.

## repository\_id\_terms

#### supports\_repository\_query()

Tests if a RepositoryQuery is available.

Returns true if a repository query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### repository\_query

Gets the query for a repository.

Multiple queries can be retrieved for a nested OR term.

**Returns** the repository query

**Return type** osid.repository.RepositoryQuery

Raise Unimplemented - supports\_repository\_query() is false

compliance: optional – This method must be implemented if "supports\_repository\_query()" is "true".

### repository\_terms

#### get\_asset\_query\_record (asset\_record\_type)

Gets the asset query record corresponding to the given Asset record Type.

Multiuple retrievals produce a nested OR term.

**Parameters asset\_record\_type** (osid.type.Type) – an asset record type

**Returns** the asset query record

Return type osid.repository.records.AssetQueryRecord

**Raise** NullArgument - asset\_record\_type is null

**Raise** OperationFailed – unable to complete request

**Raise** Unsupported - has\_record\_type (asset\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Asset Content Query**

class dlkit.repository.queries.AssetContentQuery

dlkit.osid.queries.OsidObjectQuery, dlkit.osid.queries. Bases: *OsidSubjugateableQuery* 

This is the query for searching asset contents.

Each method forms an AND term while multiple invocations of the same method produce a nested OR.

match\_accessibility\_type (accessibility\_type, match)

Sets the accessibility types for this query.

Supplying multiple types behaves like a boolean OR among the elements.

## Parameters

- accessibility\_type (osid.type.Type) an accessibilityType
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - accessibility\_type is null

compliance: mandatory – This method must be implemented.

## match\_any\_accessibility\_type (match)

Matches asset content that has any accessibility type.

**Parameters match** (boolean) - true to match content with any accessibility type, false to match content with no accessibility type

compliance: mandatory – This method must be implemented.

## accessibility\_type\_terms

match\_data\_length (low, high, match)

Matches content whose length of the data in bytes are inclusive of the given range.

## **Parameters**

- **low** (cardinal) low range
- high (cardinal) high range
- match (boolean) true for a positive match, false for a negative match

**Raise** InvalidArgument - low is greater than high

compliance: mandatory – This method must be implemented.

## match\_any\_data\_length(match)

Matches content that has any data length.

**Parameters match** (boolean) - true to match content with any data length, false to match content with no data length

compliance: mandatory – This method must be implemented.

## data\_length\_terms

match\_data (*data*, *match*, *partial*) Matches data in this content.

## **Parameters**

- data (byte []) list of matching strings
- match (boolean) true for a positive match, false for a negative match
- partial (boolean) true for a partial match, false for a complete match

Raise NullArgument - data is null

compliance: mandatory – This method must be implemented.

## match\_any\_data(match)

Matches content that has any data.

**Parameters match** (boolean) - true to match content with any data, false to match content with no data

compliance: mandatory – This method must be implemented.

## data\_terms

match\_url (url, string\_match\_type, match)
 Sets the url for this query.

Supplying multiple strings behaves like a boolean OR among the elements each which must correspond to the stringMatchType.

### **Parameters**

- url (string) url string to match
- string\_match\_type (osid.type.Type) the string match type
- match (boolean) true for a positive match, false for a negative match

**Raise** InvalidArgument – url not of string\_match\_type

Raise NullArgument - url or string\_match\_type is null

Raise Unsupported - supports\_string\_match\_type (url) is false

compliance: mandatory – This method must be implemented.

### match\_any\_url(match)

Matches content that has any url.

**Parameters match** (boolean) - true to match content with any url, false to match content with no url

compliance: mandatory – This method must be implemented.

### url\_terms

## get\_asset\_content\_query\_record (asset\_content\_record\_type)

Gets the asset content query record corresponding to the given AssetContent record Type.

Multiple record retrievals produce a nested OR term.

Parameters asset\_content\_record\_type (osid.type.Type) - an asset content record type

Returns the asset content query record

Return type osid.repository.records.AssetContentQueryRecord

**Raise** NullArgument - asset\_content\_record\_type is null

**Raise** OperationFailed – unable to complete request

Raise Unsupported - has\_record\_type(asset\_content\_record\_type) is
false

compliance: mandatory – This method must be implemented.

### **Composition Query**

```
class dlkit.repository.queries.CompositionQuery
```

```
Bases: dlkit.osid.queries.OsidObjectQuery, dlkit.osid.queries.
OsidContainableQuery, dlkit.osid.queries.OsidOperableQuery, dlkit.osid.
queries.OsidSourceableQuery
```

This is the query for searching compositions.

Each method specifies an AND term while multiple invocations of the same method produces a nested OR.

## match\_asset\_id(asset\_id, match)

Sets the asset Id for this query.

#### **Parameters**

- asset\_id (osid.id.Id) the asset Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - asset\_id is null

compliance: mandatory – This method must be implemented.

### asset\_id\_terms

## supports\_asset\_query()

Tests if an AssetQuery is available.

**Returns** true if an asset query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### asset\_query

Gets the query for an asset.

Multiple retrievals produce a nested OR term.

**Returns** the asset query

Return type osid.repository.AssetQuery

Raise Unimplemented - supports\_asset\_query() is false

compliance: optional – This method must be implemented if "supports\_asset\_query()" is "true".

#### match\_any\_asset (match)

Matches compositions that has any asset mapping.

**Parameters match** (boolean) – true to match compositions with any asset, false to match compositions with no asset

compliance: mandatory – This method must be implemented.

## asset\_terms

#### match\_containing\_composition\_id (composition\_id, match)

Sets the composition Id for this query to match compositions that have the specified composition as an ancestor.

**Parameters** 

- composition\_id (osid.id.Id) a composition Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - composition\_id is null

compliance: mandatory – This method must be implemented.

### containing\_composition\_id\_terms

## supports\_containing\_composition\_query()

Tests if an CompositionQuery is available.

Returns true if a composition query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## containing\_composition\_query

Gets the query for a composition.

Multiple retrievals produce a nested OR term.

**Returns** the composition query

Return type osid.repository.CompositionQuery

Raise Unimplemented - supports\_containing\_composition\_query() is
false

compliance: optional – This method must be implemented if ''supports\_containing\_composition\_query()'' is ''true''.

#### match\_any\_containing\_composition (match)

Matches compositions with any ancestor.

**Parameters match** (boolean) – true to match composition with any ancestor, false to match root compositions

compliance: mandatory – This method must be implemented.

#### containing\_composition\_terms

```
match_contained_composition_id (composition_id, match)
```

Sets the composition Id for this query to match compositions that contain the specified composition.

## **Parameters**

- composition\_id (osid.id.Id) a composition Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - composition\_id is null

compliance: mandatory – This method must be implemented.

## contained\_composition\_id\_terms

#### supports\_contained\_composition\_query()

Tests if an CompositionQuery is available.

**Returns** true if a composition query is available, false otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

## $\verb|contained\_composition\_query||$

Gets the query for a composition.

Multiple retrievals produce a nested OR term.

**Returns** the composition query

Return type osid.repository.CompositionQuery

Raise <code>Unimplemented-supports\_contained\_composition\_query()</code> is false

*compliance: optional – This method must be implemented if 'supports\_contained\_composition\_query()'' is ''true''.* 

#### match\_any\_contained\_composition (match)

Matches compositions that contain any other compositions.

**Parameters match** (boolean) – true to match composition with any descendant, false to match leaf compositions

compliance: mandatory – This method must be implemented.

### contained\_composition\_terms

**match\_repository\_id** (*repository\_id*, *match*) Sets the repository Id for this query.

**Parameters** 

• repository\_id (osid.id.Id) - the repository Id

• match (boolean) - true for a positive match, false for a negative match

**Raise** NullArgument - repository\_id is null

compliance: mandatory – This method must be implemented.

## repository\_id\_terms

### supports\_repository\_query()

Tests if a RepositoryQuery is available.

**Returns** true if a repository query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## repository\_query

Gets the query for a repository.

Multiple queries can be retrieved for a nested OR term.

**Returns** the repository query

Return type osid.repository.RepositoryQuery

Raise Unimplemented - supports\_repository\_query() is false

compliance: optional – This method must be implemented if "supports\_repository\_query()" is "true".

#### repository\_terms

#### get\_composition\_query\_record (composition\_record\_type)

Gets the composition query record corresponding to the given Composition record Type.

Multiple retrievals produce a nested OR term.

Parameters composition\_record\_type (osid.type.Type) - a composition record
 type

Returns the composition query record

Return type osid.repository.records.CompositionQueryRecord

Raise NullArgument - composition\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type (composition\_record\_type) is false

## **Repository Query**

```
class dlkit.repository.queries.RepositoryQuery
Bases: dlkit.osid.queries.OsidCatalogQuery
```

This is the query for searching repositories.

Each method specifies an AND term while multiple invocations of the same method produce a nested OR.

match\_asset\_id (asset\_id, match)
 Sets the asset Id for this query.

Parameters

- asset\_id (osid.id.Id) an asset Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - asset\_id is null

compliance: mandatory – This method must be implemented.

### asset\_id\_terms

## supports\_asset\_query()

Tests if an AssetQuery is available.

**Returns** true if an asset query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### asset\_query

Gets the query for an asset.

Multiple retrievals produce a nested OR term.

**Returns** the asset query

**Return type** osid.repository.AssetQuery

**Raise** Unimplemented - supports\_asset\_query() is false

compliance: optional – This method must be implemented if 'supports\_asset\_query()' is 'true'.

#### match\_any\_asset (match)

Matches repositories that has any asset mapping.

**Parameters match** (boolean) - true to match repositories with any asset, false to match repositories with no asset

compliance: mandatory – This method must be implemented.

### asset\_terms

```
match_composition_id (composition_id, match)
    Sets the composition Id for this query.
```

**Parameters** 

- composition\_id (osid.id.Id) a composition Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - composition\_id is null

#### composition\_id\_terms

#### supports\_composition\_query()

Tests if a CompositionQuery is available.

**Returns** true if a composition query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## composition\_query

Gets the query for a composition.

Multiple retrievals produce a nested OR term.

**Returns** the composition query

Return type osid.repository.CompositionQuery

Raise Unimplemented - supports\_composition\_query() is false

compliance: optional – This method must be implemented if "supports\_composition\_query()" is "true".

#### match\_any\_composition (match)

Matches repositories that has any composition mapping.

**Parameters match** (boolean) – true to match repositories with any composition, false to match repositories with no composition

compliance: mandatory – This method must be implemented.

## composition\_terms

match\_ancestor\_repository\_id(repository\_id, match)

Sets the repository Id for this query to match repositories that have the specified repository as an ancestor.

## **Parameters**

- repository\_id (osid.id.Id) a repository Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - repository\_id is null

compliance: mandatory – This method must be implemented.

## ancestor\_repository\_id\_terms

### supports\_ancestor\_repository\_query()

Tests if a RepositoryQuery is available.

**Returns** true if a repository query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## ancestor\_repository\_query

Gets the query for a repository.

Multiple retrievals produce a nested OR term.

Returns the repository query

Return type osid.repository.RepositoryQuery

Raise Unimplemented - supports\_ancestor\_repository\_query() is false

compliance: optional – This method must be implemented if "supports\_ancestor\_repository\_query()" is "true".

## match\_any\_ancestor\_repository(match)

Matches repositories with any ancestor.

**Parameters match** (boolean) – true to match repositories with any ancestor, false to match root repositories

compliance: mandatory – This method must be implemented.

### ancestor\_repository\_terms

#### match\_descendant\_repository\_id (repository\_id, match)

Sets the repository Id for this query to match repositories that have the specified repository as a descendant.

#### **Parameters**

- repository\_id (osid.id.Id) a repository Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - repository\_id is null

compliance: mandatory – This method must be implemented.

### descendant\_repository\_id\_terms

## supports\_descendant\_repository\_query()

Tests if a RepositoryQuery is available.

**Returns** true if a repository query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### descendant\_repository\_query

Gets the query for a repository.

Multiple retrievals produce a nested OR term.

**Returns** the repository query

**Return type** osid.repository.RepositoryQuery

Raise Unimplemented - supports\_descendant\_repository\_query() is false

*compliance: optional – This method must be implemented if 'supports\_descendant\_repository\_query()'' is ''true''.* 

#### match\_any\_descendant\_repository (match)

Matches repositories with any descendant.

**Parameters match** (boolean) – true to match repositories with any descendant, false to match leaf repositories

compliance: mandatory – This method must be implemented.

### descendant\_repository\_terms

#### get\_repository\_query\_record (repository\_record\_type)

Gets the repository query record corresponding to the given Repository record Type.

Multiple record retrievals produce a nested OR term.

**Parameters** repository\_record\_type (osid.type.Type) - a repository record type

Returns the repository query record
Return type osid.repository.records.RepositoryQueryRecord
Raise NullArgument - repository\_record\_type is null
Raise OperationFailed - unable to complete request
Raise Unsupported - has\_record\_type (repository\_record\_type) is false
compliance: mandatory - This method must be implemented.

# Records

## Asset Record

```
class dlkit.repository.records.AssetRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for an Asset.

The methods specified by the record type are available through the underlying object.

## **Asset Query Record**

```
class dlkit.repository.records.AssetQueryRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for an AssetQuery.

The methods specified by the record type are available through the underlying object.

## **Asset Form Record**

```
class dlkit.repository.records.AssetFormRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for an AssetForm.

The methods specified by the record type are available through the underlying object.

## **Asset Search Record**

class dlkit.repository.records.AssetSearchRecord Bases: dlkit.osid.records.OsidRecord

A record for an AssetSearch.

The methods specified by the record type are available through the underlying object.

## **Asset Content Record**

```
class dlkit.repository.records.AssetContentRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for an AssetContent.

The methods specified by the record type are available through the underlying object.

## **Asset Content Query Record**

class dlkit.repository.records.AssetContentQueryRecord Bases: dlkit.osid.records.OsidRecord

A record for an AssetContentQuery.

The methods specified by the record type are available through the underlying object.

## Asset Content Form Record

class dlkit.repository.records.AssetContentFormRecord Bases: dlkit.osid.records.OsidRecord

A record for an AssetForm.

The methods specified by the record type are available through the underlying object.

## **Composition Record**

class dlkit.repository.records.CompositionRecord Bases: dlkit.osid.records.OsidRecord

A record for a Composition.

The methods specified by the record type are available through the underlying object.

## **Composition Query Record**

class dlkit.repository.records.CompositionQueryRecord Bases: dlkit.osid.records.OsidRecord

A record for a CompositionQuery.

The methods specified by the record type are available through the underlying object.

## **Composition Form Record**

class dlkit.repository.records.CompositionFormRecord Bases: dlkit.osid.records.OsidRecord

A record for a CompositionForm.

The methods specified by the record type are available through the underlying object.

## **Composition Search Record**

class dlkit.repository.records.CompositionSearchRecord Bases: dlkit.osid.records.OsidRecord

A record for a CompositionSearch.

The methods specified by the record type are available through the underlying object.

## **Repository Record**

class dlkit.repository.records.RepositoryRecord Bases: dlkit.osid.records.OsidRecord

A record for a Repository.

The methods specified by the record type are available through the underlying object.

## **Repository Query Record**

class dlkit.repository.records.RepositoryQueryRecord Bases: dlkit.osid.records.OsidRecord

A record for a RepositoryQuery.

The methods specified by the record type are available through the underlying object.

## **Repository Form Record**

```
class dlkit.repository.records.RepositoryFormRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for a RepositoryForm.

The methods specified by the record type are available through the underlying object.

## **Repository Search Record**

class dlkit.repository.records.RepositorySearchRecord Bases: dlkit.osid.records.OsidRecord

A record for a RepositorySearch.

The methods specified by the record type are available through the underlying object.

# Resource

## Summary

Resource Open Service Interface Definitions resource version 3.0.0

The Resource OSID defines a service to access and manage a directory of objects.

Resources

Resources may represent people, places or a set or arbitrary entities that are used throughout the OSIDs as references to indirect objects. In core OSID, Resources have no other meaning other than to provide an identifier and a relation to an authentication principal. Resource Types may define extra data to define an employee, organizational unit or an inventory item.

Resources are referenced throughout the OSIDs to and the abstraction level of this service provides a consistent interface with which to access and manage object references not directly pertinent to the service in play. For example, a Repository OSID may reference Resources as authors or a Course OSID may reference Resources for students and instructors. Each of these OSIDs may orchestrate a Resource OSID to provide management of the set of referenced resources.

A Resource genus Type may be used to provide a label the kind of resource. This service offers the flexibility that the producer of a film may be a person, a production company, or a fire hydrant. While genus Types may be used to constrain the kinds of Resources that may be related to various OsidObjects if necessary, OSID Consumers are expected to simply use the Resource as a reference. If an OSID Consumer wishes to provide a mechanism for updating a Resource referenced, the OSID Consumer should use an orchestrated Resource OSID.

## Agents

A Resource also provides the mapping between an authentication Agent and the entity on whose behalf the agent is acting. An Agent can only map to a single Resource while a Resource can have multiple Agents. An agent that represents the unix login of "vijay" on server due.mit.edu can map to a Resource representing Vijay Kumar, who may also have a campus agent of "vkumar@mit.edu."

## Group

When a Resource is referenced in another OSID, it is a singular entity. To provide groupings of multiple people or things, a Resource can also be defined as a hierarchical group of other resources. Whether a resource is a single entity or a group is an attribute of the Resource itself. If a Resource is a group, then its membership can be queried or managed in one of the group sessions. This overloading of the object definition serves to keep the nature of the resource separate from the other OSIDs such that a message to a "group", for example, is referenced as a single resource receipient. Other OSIDs are blind to whether or not a referenced Resource is a group or a singular entity.

## Resource Relationships

For kicks, Resources may have arbitrrary relationships to other Resources using the ResourceRelationship interface. Resource relationships may also be used to provide a place to describe in more detail, or hang data, on a member to group relationship.

## **Bin Cataloging**

Resources may be mapped into hierarchial Bins for the purpose of cataloging or federation.

## Sub Packages

The Resource OSID includes a Resource Demographic OSID for managing dynamically generated populations of Resources and a Resource Batch OSID for managing Resources in bulk. Resource Open Service Interface Definitions resource version 3.0.0

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Agents

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The Resource OSID includes a Resource Demographic OSID for managing dynamically generated populations of Resources and a Resource Batch OSID for managing Resources in bulk.

# **Service Managers**

## **Resource Profile**

```
class dlkit.services.resource.ResourceProfile
```

 $Bases: {\tt dlkit.osid.managers.OsidProfile}$ 

The resource profile describes interoperability among resource services.

## supports\_resource\_lookup()

Tests if resource lookup is supported.

Returns true if resource lookup is supported , false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## supports\_resource\_query()

Tests if resource query is supported.

Returns true if resource query is supported , false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## supports\_resource\_search()

Tests if resource search is supported.

**Returns** true if resource search is supported , false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_resource\_admin()

Tests if resource administration is supported.

Returns true if resource administration is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## supports\_resource\_notification()

Tests if resource notification is supported.

Messages may be sent when resources are created, modified, or deleted.

**Returns** true if resource notification is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_resource\_bin()

Tests if retrieving mappings of resource and bins is supported.

Returns true if resource bin mapping retrieval is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_resource\_bin\_assignment()

Tests if managing mappings of resource and bins is supported.

Returns true if resource bin assignment is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_resource\_agent()

Tests if retrieving mappings of resource and agents is supported.

Returns true if resource agent mapping retrieval is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_resource\_agent\_assignment()

Tests if managing mappings of resources and agents is supported.

**Returns** true if resource agent assignment is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## supports\_bin\_lookup()

Tests if bin lookup is supported.

Returns true if bin lookup is supported , false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## supports\_bin\_query()

Tests if bin query is supported.

**Returns** true if bin query is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## supports\_bin\_admin()

Tests if bin administration is supported.

**Returns** true if bin administration is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

### supports\_bin\_hierarchy()

Tests if a bin hierarchy traversal is supported.

Returns true if a bin hierarchy traversal is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### supports\_bin\_hierarchy\_design()

Tests if a bin hierarchy design is supported.

Returns true if a bin hierarchy design is supported, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### resource\_record\_types

Gets all the resource record types supported.

**Returns** the list of supported resource record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

## resource\_search\_record\_types

Gets all the resource search record types supported.

**Returns** the list of supported resource search record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### resource\_relationship\_record\_types

Gets the supported ResourceRelationship record types.

Returns a list containing the supported ResourceRelationship record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

#### resource\_relationship\_search\_record\_types

Gets the supported ResourceRelationship search record types.

**Returns** a list containing the supported ResourceRelationship search record types

Return type osid.type.TypeList

#### bin\_record\_types

Gets all the bin record types supported.

**Returns** the list of supported bin record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

### bin\_search\_record\_types

Gets all the bin search record types supported.

**Returns** the list of supported bin search record types

Return type osid.type.TypeList

compliance: mandatory – This method must be implemented.

## **Resource Manager**

class dlkit.services.resource.ResourceManager(proxy=None)

Bases: dlkit.osid.managers.OsidManager, dlkit.osid.sessions.OsidSession, dlkit.services.resource.ResourceProfile

The resource manager provides access to resource lookup and creation sessions and provides interoperability tests for various aspects of this service.

The sessions included in this manager are:

•ResourceLookupSession: a session to retrieve resources

•ResourceQuerySession: a session to query resources

•ResourceSearchSession: a session to search for resources

•ResourceAdminSession: a session to create and delete resources

•ResourceNotificationSession: a session to receive notifications pertaining to resource changes

•ResourceBinSession: a session to look up resource to bin mappings

•ResourceBinAssignmentSession: a session to manage resource to bin mappings

•ResourceSmartBinSession: a session to manage smart resource bins

•MembershipSession: a session to query memberships

•GroupSession: a session to retrieve group memberships

•GroupAssignmentSession: a session to manage groups

•GroupNotificationSession: a session to retrieve notifications on changes to group membership

•GroupHierarchySession: a session to view a group hierarchy

•RsourceAgentSession: a session to retrieve Resource and Agent mappings

•ResourceAgentAssignmentSession: a session to manage Resource and Agent mappings

•ResourceRelationshipLookupSession: a session to retrieve resource relationships

•ResourceRelationshipQuerySession: a session to query for resource relationships

•ResourceRelationshipSearchSession: a session to search for resource relationships

•ResourceRelationshipAdminSession: a session to create and delete resource relationships

•ResourceRelationshipNotificationSession: a session to receive notifications pertaining to resource relationshipchanges

•ResourceRelationshipBinSession: a session to look up resource relationship to bin mappings

•ResourceRelationshipBinAssignmentSession: a session to manage resource relationship to bin mappings

•ResourceRelationshipSmartBinSession: a session to manage smart resource relationship bins

•BinLookupSession: a session to retrieve bins

•BinQuerySession: a session to query bins

•BinSearchSession: a session to search for bins

•BinAdminSession: a session to create, update and delete bins

•BinNotificationSession: a session to receive notifications pertaining to changes in bins

•BinHierarchySession: a session to traverse bin hierarchies

•BinHierarchyDesignSession: a session to manage bin hierarchies

#### resource\_batch\_manager

 $Gets \ the \ {\tt ResourceBatchManager}.$ 

**Returns** a ResourceBatchManager

Return type osid.resource.batch.ResourceBatchManager

Raise OperationFailed - unable to complete request

Raise Unimplemented - supports\_resource\_batch() is false

compliance: optional – This method must be implemented if ''supports\_resource\_batch()'' is ''true''.

#### resource\_demographic\_manager

Gets the ResourceDemographicManager.

Returns a ResourceDemographicManager

Return type osid.resource.demographic.ResourceDemographicManager

Raise OperationFailed - unable to complete request

**Raise** Unimplemented - supports\_resource\_demographic() is false

compliance: optional – This method must be implemented if "supports\_resource\_demographic()" is "true".

## **Bin Lookup Methods**

ResourceManager.can\_lookup\_bins()

Tests if this user can perform Bin lookups.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

**Returns** false if lookup methods are not authorized, true otherwise

Return type boolean

```
ResourceManager.use_comparative_bin_view()
```

The returns from the bin methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

```
ResourceManager.use_plenary_bin_view()
```

A complete view of the Bin returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

```
ResourceManager.get_bin(bin_id)
```

Gets the Bin specified by its Id.

In plenary mode, the exact Id is found or a NotFound results. Otherwise, the returned Bin may have a different Id than requested, such as the case where a duplicate Id was assigned to a Bin and retained for compatibility.

Parameters bin\_id (osid.id.Id) - Id of the Bin

Returns the bin

Return type osid.resource.Bin

Raise NotFound - bin id not found

Raise NullArgument - bin\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method is must be implemented.

```
ResourceManager.get_bins_by_ids(bin_ids)
```

Gets a BinList corresponding to the given IdList.

In plenary mode, the returned list contains all of the bins specified in the Id list, in the order of the list, including duplicates, or an error results if an Id in the supplied list is not found or inaccessible. Otherwise, inaccessible Bins may be omitted from the list and may present the elements in any order including returning a unique set.

Parameters bin\_ids (osid.id.IdList) - the list of Ids to retrieve

Returns the returned Bin list

Return type osid.resource.BinList

Raise NotFound - an Id was not found

**Raise** NullArgument - bin\_ids is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ResourceManager.get\_bins\_by\_genus\_type (bin\_genus\_type)

Gets a BinList corresponding to the given bin genus Type which does not include bins of types derived from the specified Type.

In plenary mode, the returned list contains all known bins or an error results. Otherwise, the returned list may contain only those bins that are accessible through this session.

Parameters bin\_genus\_type (osid.type.Type) - a bin genus type

Returns the returned Bin list

Return type osid.resource.BinList

**Raise** NullArgument - bin\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

ResourceManager.get\_bins\_by\_parent\_genus\_type (bin\_genus\_type)

Gets a BinList corresponding to the given bin genus Type and include any additional bins with genus types derived from the specified Type.

In plenary mode, the returned list contains all known bins or an error results. Otherwise, the returned list may contain only those bins that are accessible through this session.

**Parameters bin\_genus\_type** (osid.type.Type) - a bin genus type

Returns the returned Bin list

Return type osid.resource.BinList

**Raise** NullArgument - bin\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

ResourceManager.get\_bins\_by\_record\_type (*bin\_record\_type*) Gets a BinList containing the given bin record Type.

In plenary mode, the returned list contains all known bins or an error results. Otherwise, the returned list may contain only those bins that are accessible through this session.

**Parameters bin\_record\_type** (osid.type.Type) - a bin record type

Returns the returned Bin list

Return type osid.resource.BinList

**Raise** NullArgument - bin\_record\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ResourceManager.get\_bins\_by\_provider (*resource\_id*) Gets a BinList from the given provider.

In plenary mode, the returned list contains all known bins or an error results. Otherwise, the returned list may contain only those bins that are accessible through this session.

Parameters resource\_id (osid.id.Id) - a resource Id

Returns the returned Bin list

**Return type** osid.resource.BinList

**Raise** NullArgument - resource\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ResourceManager.bins

Gets all Bins.

In plenary mode, the returned list contains all known bins or an error results. Otherwise, the returned list may contain only those bins that are accessible through this session.

**Returns** a list of Bins

Return type osid.resource.BinList

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## **Bin Query Methods**

#### ResourceManager.can\_search\_bins()

Tests if this user can perform Bin searches.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer search operations to unauthorized users.

Returns false if search methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

ResourceManager.bin\_query

Gets a bin query.

The returned query will not have an extension query.

**Returns** the bin query

Return type osid.resource.BinQuery

compliance: mandatory – This method must be implemented.

ResourceManager.get\_bins\_by\_query (*bin\_query*) Gets a list of Bins matching the given bin query.

Parameters bin\_query (osid.resource.BinQuery) - the bin query

Returns the returned BinList

Return type osid.resource.BinList

Raise NullArgument - bin\_query is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

**Raise** Unsupported – a bin\_query is not of this service

compliance: mandatory – This method must be implemented.

## **Bin Admin Methods**

```
ResourceManager.can_create_bins()
```

Tests if this user can create Bins.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating a Bin will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer create operations to unauthorized users.

Returns false if Bin creation is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

ResourceManager.can\_create\_bin\_with\_record\_types (*bin\_record\_types*) Tests if this user can create a single Bin using the desired record types.

While ResourceManager.getBinRecordTypes() can be used to examine which records are supported, this method tests which record(s) are required for creating a specific Bin. Providing an empty array tests if a Bin can be created with no records.

**Parameters bin\_record\_types** (osid.type.Type[]) - array of bin record types

**Returns** true if Bin creation using the specified Types is supported, false otherwise

Return type boolean

Raise NullArgument - bin\_record\_types is null

compliance: mandatory – This method must be implemented.

ResourceManager.get\_bin\_form\_for\_create (*bin\_record\_types*) Gets the bin form for creating new bins.

**Parameters bin\_record\_types** (osid.type.Type[]) - array of bin record types

**Returns** the bin form

Return type osid.resource.BinForm

**Raise** NullArgument - bin\_record\_types is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported – unable to get form with requested record types

compliance: mandatory – This method must be implemented.

ResourceManager.create\_bin(bin\_form)

Creates a new Bin.

Parameters bin\_form (osid.resource.BinForm) - the form for this Bin

 $Returns \ \mbox{the new Bin}$ 

Return type osid.resource.Bin

Raise IllegalState - bin\_form already used in a create transaction

Raise InvalidArgument - one or more of the form elements is invalid

Raise NullArgument - bin\_form is null

Raise OperationFailed - unable to complete request
Raise PermissionDenied - authorization failure
Raise Unsupported - bin\_form did not originate from
get\_bin\_form\_for\_create()

compliance: mandatory – This method must be implemented.

#### ResourceManager.can\_update\_bins()

Tests if this user can update Bins.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating a Bin will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer update operations to unauthorized users.

Returns false if Bin modification is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

ResourceManager.get\_bin\_form\_for\_update (*bin\_id*) Gets the bin form for updating an existing bin.

A new bin form should be requested for each update transaction.

Parameters bin\_id (osid.id.Id) - the Id of the Bin

Returns the bin form

Return type osid.resource.BinForm

Raise NotFound - bin\_id is not found

**Raise** NullArgument - bin\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ResourceManager.update\_bin(bin\_form)

Updates an existing bin.

**Parameters bin\_form** (osid.resource.BinForm) – the form containing the elements to be updated

**Raise** IllegalState - bin\_form already used in an update transaction

Raise InvalidArgument - the form contains an invalid value

**Raise** NullArgument - bin\_id or bin\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

**Raise** Unsupported – bin\_form did not originate from get\_bin\_form\_for\_update()

```
ResourceManager.can_delete_bins()
```

```
Tests if this user can delete Bins.
```

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting a Bin will result in a PermissionDenied. This is intended as a hint to an application that may not wish to offer delete operations to unauthorized users.

Returns false if Bin deletion is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

ResourceManager.delete\_bin(bin\_id)

Deletes a Bin.

Parameters bin\_id (osid.id.Id) - the Id of the Bin to remove

Raise NotFound - bin\_id not found

Raise NullArgument - bin\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ResourceManager.can\_manage\_bin\_aliases()

Tests if this user can manage Id aliases for Bins.

A return of true does not guarantee successful authorization. A return of false indicates that it is known changing an alias will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer alias operations to an unauthorized user.

Returns false if Bin aliasing is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

ResourceManager.alias\_bin(bin\_id, alias\_id)

Adds an Id to a Bin for the purpose of creating compatibility.

The primary Id of the Bin is determined by the provider. The new Id performs as an alias to the primary Id. If the alias is a pointer to another bin, it is reassigned to the given bin Id.

#### **Parameters**

- bin\_id (osid.id.Id) the Id of a Bin
- alias\_id (osid.id.Id) the alias Id

Raise AlreadyExists - alias\_id is already assigned

Raise NotFound - bin\_id not found

Raise NullArgument - bin\_id or alias\_id is null

 $Raise \ {\tt OperationFailed-unable to \ complete \ request}$ 

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## **Bin Hierarchy Methods**

```
ResourceManager.bin_hierarchy_id
```

Gets the hierarchy Id associated with this session.

Returns the hierarchy Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

## ResourceManager.bin\_hierarchy

Gets the hierarchy associated with this session.

**Returns** the hierarchy associated with this session

Return type osid.hierarchy.Hierarchy

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### ResourceManager.can\_access\_bin\_hierarchy()

Tests if this user can perform hierarchy queries.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an an application that may not offer traversal functions to unauthorized users.

Returns false if hierarchy traversal methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### ResourceManager.use\_comparative\_bin\_view()

The returns from the bin methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory – This method is must be implemented.

## ResourceManager.use\_plenary\_bin\_view()

A complete view of the Bin returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory - This method is must be implemented.

## ResourceManager.root\_bin\_ids

Gets the root bin Ids in this hierarchy.

Returns the root bin Ids

Return type osid.id.IdList

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

## ResourceManager.root\_bins

Gets the root bins in the bin hierarchy.

A node with no parents is an orphan. While all bin Ids are known to the hierarchy, an orphan does not appear in the hierarchy unless explicitly added as a root node or child of another node.

**Returns** the root bins

Return type osid.resource.BinList

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method is must be implemented.

ResourceManager.has\_parent\_bins (bin\_id) Tests if the Bin has any parents.

Parameters bin\_id (osid.id.Id) - the Id of a bin

Returns true if the bin has parents, false otherwise

Return type boolean

**Raise** NotFound – bin\_id is not found

Raise NullArgument - bin\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## ResourceManager.is\_parent\_of\_bin (*id\_*, *bin\_id*) Tests if an Id is a direct parent of a bin.

#### **Parameters**

- id (osid.id.Id) an Id
- bin\_id (osid.id.Id) the Id of a bin

**Returns** true if this id is a parent of bin\_id, false otherwise

Return type boolean

Raise NotFound - bin\_id is not found

**Raise** NullArgument - id or bin\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented. implementation notes:* If id not found return false.

ResourceManager.get\_parent\_bin\_ids (*bin\_id*) Gets the parent Ids of the given bin.

**Parameters bin id** (osid.id.Id) – the Id of a bin

Returns the parent Ids of the bin

Return type osid.id.IdList

**Raise** NotFound – bin\_id is not found

Raise NullArgument - bin\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

ResourceManager.get\_parent\_bins (*bin\_id*) Gets the parents of the given bin.

Parameters bin\_id (osid.id.Id) - the Id to query

Returns the parents of the bin

Return type osid.resource.BinList

Raise NotFound - bin\_id not found

Raise NullArgument - bin\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ResourceManager.is\_ancestor\_of\_bin(id\_, bin\_id)

Tests if an Id is an ancestor of a bin.

#### Parameters

- id (osid.id.Id) an Id
- bin\_id (osid.id.Id) the Id of a bin

Returns true if this id is an ancestor of bin\_id, false otherwise

Return type boolean

**Raise** NotFound – bin\_id is not found

**Raise** NullArgument - id or bin\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented. implementation notes*: If id not found return false.

## ResourceManager.has\_child\_bins(bin\_id)

Tests if a bin has any children.

**Parameters bin\_id** (osid.id.Id) - the Id of a bin

Returns true if the bin\_id has children, false otherwise

Return type boolean

Raise NotFound - bin\_id not found

**Raise** NullArgument - bin\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

ResourceManager.is\_child\_of\_bin(id\_, bin\_id)

Tests if a bin is a direct child of another.

## Parameters

- id (osid.id.Id) an Id
- **bin\_id** (osid.id.Id) the Id of a bin

**Returns** true if the id is a child of bin\_id, false otherwise

Return type boolean

Raise NotFound - bin\_id is not found

Raise NullArgument - id or bin\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented. implementation notes*: If id not found return false.

ResourceManager.get\_child\_bin\_ids (*bin\_id*) Gets the child Ids of the given bin.

Parameters bin\_id (osid.id.Id) - the Id to query

Returns the children of the bin

Return type osid.id.IdList

Raise NotFound - bin\_id not found

Raise NullArgument - bin\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented.* 

## ResourceManager.get\_child\_bins(bin\_id)

Gets the children of the given bin.

Parameters bin\_id (osid.id.Id) - the Id to query

**Returns** the children of the bin

Return type osid.resource.BinList

Raise NotFound - bin\_id not found

Raise NullArgument - bin\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ResourceManager.**is\_descendant\_of\_bin** (*id\_, bin\_id*) Tests if an Id is a descendant of a bin.

## Parameters

- id (osid.id.Id) an Id
- bin\_id (osid.id.Id) the Id of a bin

Returns true if the id is a descendant of the bin\_id, false otherwise

Return type boolean

**Raise** NotFound - bin\_id is not found

Raise NullArgument - id or bin\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented. implementation notes:* If id is not found return false.

ResourceManager.get\_bin\_node\_ids (bin\_id, ancestor\_levels, descendant\_levels, in-

clude\_siblings)

Gets a portion of the hierarchy for the given bin.

#### Parameters

- bin\_id (osid.id.Id) the Id to query
- **ancestor\_levels** (cardinal) the maximum number of ancestor levels to include. A value of 0 returns no parents in the node.
- **descendant\_levels** (cardinal) the maximum number of descendant levels to include. A value of 0 returns no children in the node.
- **include\_siblings** (boolean) true to include the siblings of the given node, false to omit the siblings

#### **Returns** a bin node

Return type osid.hierarchy.Node

Raise NotFound - bin\_id not found

**Raise** NullArgument - bin\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ResourceManager.get\_bin\_nodes(bin\_id, ancestor\_levels, descendant\_levels, include\_siblings)

Gets a portion of the hierarchy for the given bin.

#### **Parameters**

- **bin\_id** (osid.id.Id) the Id to query
- **ancestor\_levels** (cardinal) the maximum number of ancestor levels to include. A value of 0 returns no parents in the node.
- **descendant\_levels** (cardinal) the maximum number of descendant levels to include. A value of 0 returns no children in the node.
- include\_siblings (boolean) true to include the siblings of the given node, false to omit the siblings

## Returns a bin node

Return type osid.resource.BinNode

Raise NotFound - bin\_id not found

**Raise** NullArgument - bin\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

## **Bin Hierarchy Design Methods**

ResourceManager.bin\_hierarchy\_id

Gets the hierarchy Id associated with this session.

**Returns** the hierarchy Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

## ResourceManager.bin\_hierarchy

Gets the hierarchy associated with this session.

Returns the hierarchy associated with this session

Return type osid.hierarchy.Hierarchy

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

# ResourceManager.can\_modify\_bin\_hierarchy()

Tests if this user can change the hierarchy.

A return of true does not guarantee successful authorization. A return of false indicates that it is known performing any update will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer these operations to an unauthorized user.

Returns false if changing this hierarchy is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

ResourceManager.add\_root\_bin(bin\_id)

Adds a root bin.

Parameters bin\_id (osid.id.Id) - the Id of a bin

Raise AlreadyExists - bin\_id is already in hierarchy

Raise NotFound - bin\_id not found

**Raise** NullArgument - bin\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

```
ResourceManager.remove_root_bin(bin_id)
```

Removes a root bin.

Parameters bin\_id (osid.id.Id) - the Id of a bin

Raise NotFound - bin\_id not a root

**Raise** NullArgument - bin\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

ResourceManager.add\_child\_bin (*bin\_id*, *child\_id*) Adds a child to a bin.

#### **Parameters**

- bin\_id (osid.id.Id) the Id of a bin
- child\_id (osid.id.Id) the Id of the new child

Raise AlreadyExists - bin\_id is already a parent of child\_id

Raise NotFound - bin\_id or child\_id not found

Raise NullArgument - bin\_id or child\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

ResourceManager.**remove\_child\_bin** (*bin\_id*, *child\_id*) Removes a child from a bin.

#### **Parameters**

- bin\_id (osid.id.Id) the Id of a bin
- child\_id (osid.id.Id) the Id of the new child

Raise NotFound - bin\_id not a parent of child\_id

**Raise** NullArgument - bin\_id or child\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented.* 

ResourceManager.**remove\_child\_bins** (*bin\_id*) Removes all children from a bin.

Parameters bin\_id (osid.id.Id) - the Id of a bin

Raise NotFound – bin\_id not in hierarchy

**Raise** NullArgument - bin\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## Bin

### Bin

class dlkit.services.resource.Bin (provider\_manager, catalog, runtime, proxy, \*\*kwargs)
Bases: dlkit.osid.objects.OsidCatalog, dlkit.osid.sessions.OsidSession

An inventory defines a collection of resources.

#### get\_bin\_record (bin\_record\_type)

Gets the bin record corresponding to the given Bin record Type.

This method is used to retrieve an object implementing the requested record. The bin\_record\_type may be the Type returned in get\_record\_types () or any of its parents in a Type hierarchy where has\_record\_type (bin\_record\_type) is true.

Parameters bin\_record\_type (osid.type.Type) - the bin record type

**Returns** the bin record

Return type osid.resource.records.BinRecord

**Raise** NullArgument - bin\_record\_type is null

**Raise** OperationFailed – unable to complete request

**Raise** Unsupported - has\_record\_type (bin\_record\_type) is false

compliance: mandatory – This method must be implemented.

### **Resource Lookup Methods**

## Bin.bin\_id

Gets the Bin Id associated with this session.

Returns the Bin Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### Bin.bin

Gets the Bin associated with this session.

Returns the Bin associated with this session

Return type osid.resource.Bin

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

#### Bin.can\_lookup\_resources()

Tests if this user can perform Resource lookups.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations.

Returns false if lookup methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### Bin.use\_comparative\_resource\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

#### Bin.use\_plenary\_resource\_view()

A complete view of the Resource returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

## Bin.use\_federated\_bin\_view()

Federates the view for methods in this session.

A federated view will include resources in bins which are children of this bin in the bin hierarchy.

compliance: mandatory – This method is must be implemented.

#### Bin.use\_isolated\_bin\_view()

Isolates the view for methods in this session.

An isolated view restricts lookups to this bin only.

compliance: mandatory – This method is must be implemented.

#### Bin.get\_resource(resource\_id)

Gets the Resource specified by its Id.

In plenary mode, the exact Id is found or a NotFound results. Otherwise, the returned Resource may have a different Id than requested, such as the case where a duplicate Id was assigned to a Resource and retained for compatibility.

Parameters resource\_id (osid.id.Id) - the Id of the Resource to retrieve

Returns the returned Resource

Return type osid.resource.Resource

Raise NotFound - no Resource found with the given Id

Raise NullArgument - resource\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Bin.get\_resources\_by\_ids (resource\_ids)

Gets a ResourceList corresponding to the given IdList.

In plenary mode, the returned list contains all of the resources specified in the Id list, in the order of the list, including duplicates, or an error results if an Id in the supplied list is not found or inaccessible. Otherwise, inaccessible Resources may be omitted from the list and may present the elements in any order including returning a unique set.

Parameters resource\_ids (osid.id.IdList) - the list of Ids to retrieve

Returns the returned Resource list

Return type osid.resource.ResourceList

Raise NotFound - an Id was not found

Raise NullArgument - resource\_ids is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

Bin.get\_resources\_by\_genus\_type (resource\_genus\_type)

Gets a ResourceList corresponding to the given resource genus Type which does not include resources of types derived from the specified Type.

In plenary mode, the returned list contains all known resources or an error results. Otherwise, the returned list may contain only those resources that are accessible through this session.

Parameters resource\_genus\_type (osid.type.Type) - a resource genus type

Returns the returned Resource list

Return type osid.resource.ResourceList

Raise NullArgument - resource\_genus\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Bin.get\_resources\_by\_parent\_genus\_type (resource\_genus\_type)

Gets a ResourceList corresponding to the given resource genus Type and include any additional resources with genus types derived from the specified Type.

In plenary mode, the returned list contains all known resources or an error results. Otherwise, the returned list may contain only those resources that are accessible through this session.

Parameters resource\_genus\_type (osid.type.Type) - a resource genus type

Returns the returned Resource list

Return type osid.resource.ResourceList

**Raise** NullArgument - resource\_genus\_type is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Bin.get\_resources\_by\_record\_type (resource\_record\_type)

Gets a ResourceList containing the given resource record Type.

In plenary mode, the returned list contains all known resources or an error results. Otherwise, the returned list may contain only those resources that are accessible through this session.

Parameters resource\_record\_type (osid.type.Type) - a resource record
type

Returns the returned Resource list

Return type osid.resource.ResourceList

**Raise** NullArgument - resource\_record\_type is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

## Bin.resources

Gets all Resources.

In plenary mode, the returned list contains all known resources or an error results. Otherwise, the returned list may contain only those resources that are accessible through this session.

Returns a list of Resources

Return type osid.resource.ResourceList

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## **Resource Query Methods**

#### Bin.bin\_id

Gets the Bin Id associated with this session.

Returns the Bin Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

## Bin**.bin**

Gets the Bin associated with this session.

Returns the Bin associated with this session

Return type osid.resource.Bin

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Bin.can\_search\_resources()

Tests if this user can perform Resource searches.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer search operations to unauthorized users.

**Returns** false if search methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### Bin.use\_federated\_bin\_view()

Federates the view for methods in this session.

A federated view will include resources in bins which are children of this bin in the bin hierarchy.

compliance: mandatory - This method is must be implemented.

## Bin.use\_isolated\_bin\_view()

Isolates the view for methods in this session.

An isolated view restricts lookups to this bin only.

compliance: mandatory - This method is must be implemented.

#### Bin.resource\_query

Gets a resource query.

The returned query will not have an extension query.

Returns the resource query

Return type osid.resource.ResourceQuery

compliance: mandatory – This method must be implemented.

Bin.get\_resources\_by\_query(resource\_query)

Gets a list of Resources matching the given resource query.

Parameters resource\_query (osid.resource.ResourceQuery) - the resource query

Returns the returned ResourceList

Return type osid.resource.ResourceList

**Raise** NullArgument – resource\_query is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported - resource\_query is not of this service

compliance: mandatory – This method must be implemented.

## **Resource Search Methods**

#### Bin.resource\_search

Gets a resource search.

Returns the resource search

Return type osid.resource.ResourceSearch

compliance: mandatory – This method must be implemented.

#### Bin.resource\_search\_order

Gets a resource search order.

The ResourceSearchOrder is supplied to a ResourceSearch to specify the ordering of results.

**Returns** the resource search order

Return type osid.resource.ResourceSearchOrder

compliance: mandatory – This method must be implemented.

#### Bin.get\_resources\_by\_search(resource\_query, resource\_search)

Gets the search results matching the given search query using the given search.

Parameters

- **resource\_query** (osid.resource.ResourceQuery) the resource query
- **resource\_search** (osid.resource.ResourceSearch) the resource search

Returns the resource search results

Return type osid.resource.ResourceSearchResults

Raise NullArgument - resource\_query or resource\_search is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

Raise Unsupported - resource\_query or resource\_search is not of this service

compliance: mandatory – This method must be implemented.

Bin.get\_resource\_query\_from\_inspector (*resource\_query\_inspector*) Gets a resource query from an inspector.

The inspector is available from a ResourceSearchResults.

Parameters resource\_query\_inspector(osid.resource.ResourceQueryInspector) - a resource query inspector

**Returns** the resource query

Return type osid.resource.ResourceQuery

**Raise** NullArgument - resource\_query\_inspector is null

Raise Unsupported - resource\_query\_inspector is not of this service

compliance: mandatory – This method must be implemented.

## **Resource Admin Methods**

#### Bin.bin\_id

Gets the Bin Id associated with this session.

Returns the Bin Id associated with this session

Return type osid.id.Id

*compliance: mandatory – This method must be implemented.* 

#### Bin.**bin**

Gets the Bin associated with this session.

Returns the Bin associated with this session

Return type osid.resource.Bin

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

### Bin.can\_create\_resources()

Tests if this user can create Resources.

A return of true does not guarantee successful authorization. A return of false indicates that it is known creating a Resource will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer create operations to an unauthorized user.

Returns false if Resource creation is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Bin.can\_create\_resource\_with\_record\_types (*resource\_record\_types*) Tests if this user can create a single Resource using the desired record types.

While ResourceManager.getResourceRecordTypes() can be used to examine which records are supported, this method tests which record(s) are required for creating a specific Resource. Providing an empty array tests if a Resource can be created with no records.

- Parameters resource\_record\_types(osid.type.Type[])-array of resource record types
- **Returns** true if Resource creation using the specified Types is supported, false otherwise

Return type boolean

Raise NullArgument - resource\_record\_types is null

compliance: mandatory – This method must be implemented.

Bin.get\_resource\_form\_for\_create (*resource\_record\_types*) Gets the resource form for creating new resources.

A new form should be requested for each create transaction.

Parameters resource\_record\_types(osid.type.Type[])-array of resource record types

**Returns** the resource form

Return type osid.resource.ResourceForm

Raise NullArgument - resource\_record\_types is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

Raise Unsupported – unable to get form with requested record types

compliance: mandatory – This method must be implemented.

## Bin.create\_resource(resource\_form)

Creates a new Resource.

Parameters resource\_form (osid.resource.ResourceForm) - the form for
 this Resource

Returns the new Resource

Return type osid.resource.Resource

Raise IllegalState - resource\_form already used in a create transaction

**Raise** InvalidArgument – one or more of the form elements is invalid

Raise NullArgument - resource\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

Raise Unsupported - resource\_form did not originate from
get\_resource\_form\_for\_create()

compliance: mandatory – This method must be implemented.

## Bin.can\_update\_resources()

Tests if this user can update Resources.

A return of true does not guarantee successful authorization. A return of false indicates that it is known updating a Resource will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer update operations to an unauthorized user.

Returns false if Resource modification is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

Bin.get\_resource\_form\_for\_update(resource\_id)

Gets the resource form for updating an existing resource.

A new resource form should be requested for each update transaction.

Parameters resource\_id (osid.id.Id) - the Id of the Resource

Returns the resource form

Return type osid.resource.ResourceForm

Raise NotFound - resource\_id is not found

**Raise** NullArgument - resource\_id is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Bin.update\_resource(resource\_form)

Updates an existing resource.

**Parameters resource\_form** (osid.resource.ResourceForm) – the form containing the elements to be updated

**Raise** IllegalState – resource\_form already used in an update transaction

Raise InvalidArgument - the form contains an invalid value

Raise NullArgument - resource\_form is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

```
Raise Unsupported - resource_form did not originate from
  get_resource_form_for_update()
```

compliance: mandatory – This method must be implemented.

#### Bin.can\_delete\_resources()

Tests if this user can delete Resources.

A return of true does not guarantee successful authorization. A return of false indicates that it is known deleting a Resource will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer delete operations to an unauthorized user.

**Returns** false if Resource deletion is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
Bin.delete_resource(resource_id)
```

Deletes a Resource.

Parameters resource\_id (osid.id.Id) - the Id of the Resource to remove

Raise NotFound - resource\_id not found

Raise NullArgument - resource\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Bin.can\_manage\_resource\_aliases()

Tests if this user can manage Id aliases for Resources.

A return of true does not guarantee successful authorization. A return of false indicates that it is known changing an alias will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer alias operations to an unauthorized user.

Returns false if Resource aliasing is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
Bin.alias_resource(resource_id, alias_id)
```

Adds an Id to a Resource for the purpose of creating compatibility.

The primary Id of the Resource is determined by the provider. The new Id performs as an alias to the primary Id. If the alias is a pointer to another resource it is reassigned to the given resource Id.

#### **Parameters**

• **resource\_id** (osid.id.Id) - the Id of a Resource

• alias\_id (osid.id.Id) - the alias Id

**Raise** AlreadyExists - alias\_id is already assigned

Raise NotFound - resource\_id not found

Raise NullArgument - alias\_id or resource\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## **Resource Notification Methods**

```
Bin.bin_id
```

Gets the Bin Id associated with this session.

Returns the Bin Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

## Bin**.bin**

Gets the Bin associated with this session.

Returns the Bin associated with this session

Return type osid.resource.Bin

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

## Bin.can\_register\_for\_resource\_notifications()

Tests if this user can register for Resource notifications.

A return of true does not guarantee successful authorization. A return of false indicates that it is known all methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer notification operations.

Returns false if notification methods are not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

## Bin.use\_federated\_bin\_view()

Federates the view for methods in this session.

A federated view will include resources in bins which are children of this bin in the bin hierarchy.

compliance: mandatory - This method is must be implemented.

#### Bin.use\_isolated\_bin\_view()

Isolates the view for methods in this session.

An isolated view restricts lookups to this bin only.

compliance: mandatory – This method is must be implemented.

## Bin.register\_for\_new\_resources()

Register for notifications of new resources.

ResourceReceiver.newResources() is invoked when a new Resource is appears in this bin.

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

### Bin.register\_for\_changed\_resources()

Registers for notification of updated resources.

ResourceReceiver.changedResources() is invoked when a resource in this bin is changed.

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## Bin.register\_for\_changed\_resource(resource\_id)

Registers for notification of an updated resource.

ResourceReceiver.changedResources() is invoked when the specified resource in this bin is changed.

Parameters resource\_id (osid.id.Id) - the Id of the Resource to monitor

Raise NullArgument - resource\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

## Bin.register\_for\_deleted\_resources()

Registers for notification of deleted resources.

ResourceReceiver.deletedResources() is invoked when a resource is deleted or removed from this bin.

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## Bin.register\_for\_deleted\_resource(resource\_id)

Registers for notification of a deleted resource.

ResourceReceiver.deletedResources() is invoked when the specified resource is deleted or removed from this bin.

Parameters resource\_id (osid.id.Id) - the Id of the Resource to monitor

**Raise** NullArgument - resource\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## Bin.reliable\_resource\_notifications()

Reliable notifications are desired.

In reliable mode, notifications are to be acknowledged using acknowledge\_item\_notification().

compliance: mandatory – This method is must be implemented.

## Bin.unreliable\_resource\_notifications()

Unreliable notifications are desired.

In unreliable mode, notifications do not need to be acknowledged.

compliance: mandatory – This method is must be implemented.

#### Bin.acknowledge\_resource\_notification (notification\_id)

Acknowledge an resource notification.

Parameters notification\_id (osid.id.Id) - the Id of the notification

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## **Resource Bin Methods**

```
Bin.use_comparative_bin_view()
```

The returns from the lookup methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

```
Bin.use_plenary_bin_view()
```

A complete view of the Resource and Bin returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

```
Bin.can_lookup_resource_bin_mappings()
```

Tests if this user can perform lookups of resource/bin mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known lookup methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

**Returns** false if looking up mappings is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### Bin.get\_resource\_ids\_by\_bin(bin\_id)

Gets the list of Resource Ids associated with a Bin.

Parameters bin\_id (osid.id.Id) - Id of a Bin

Returns list of related resource Ids

Return type osid.id.IdList

**Raise** NotFound – bin\_id is not found

Raise NullArgument - bin\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Bin.get\_resources\_by\_bin(bin\_id)

Gets the list of Resources associated with a Bin.

Parameters bin\_id (osid.id.Id) - Id of a Bin

**Returns** list of related resources

Return type osid.resource.ResourceList

Raise NotFound - bin\_id is not found

Raise NullArgument - bin\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

#### Bin.get\_resource\_ids\_by\_bins(bin\_ids)

Gets the list of Resource Ids corresponding to a list of Bin objects.

Parameters bin\_ids (osid.id.IdList) - list of bin Ids

Returns list of resource Ids

Return type osid.id.IdList

**Raise** NullArgument - bin\_ids is null

**Raise** OperationFailed – unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

#### Bin.get\_resources\_by\_bins(bin\_ids)

Gets the list of Resources corresponding to a list of Bins.

Parameters bin\_ids (osid.id.IdList) - list of bin Ids

Returns list of resources

Return type osid.resource.ResourceList

**Raise** NullArgument - bin\_ids is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## Bin.get\_bin\_ids\_by\_resource (*resource\_id*) Gets the list of Bin Ids mapped to a Resource.

Parameters resource\_id (osid.id.Id) - Id of a Resource

Returns list of bin Ids

Return type osid.id.IdList

**Raise** NotFound – resource\_id is not found

**Raise** NullArgument - resource\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## Bin.get\_bins\_by\_resource(resource\_id)

Gets the list of Bin objects mapped to a Resource.

Parameters resource\_id (osid.id.Id) - Id of a Resource

**Returns** list of bins

Return type osid.resource.BinList

**Raise** NotFound - resource\_id is not found

**Raise** NullArgument - resource\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

*compliance: mandatory – This method must be implemented.* 

## **Resource Bin Assignment Methods**

```
Bin.can_assign_resources()
```

Tests if this user can alter resource/bin mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known mapping methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer assignment operations to unauthorized users.

**Returns** false if mapping is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
Bin.can_assign_resources_to_bin(bin_id)
```

Tests if this user can alter resource/bin mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known mapping methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer assignment operations to unauthorized users.

Parameters bin\_id (osid.id.Id) - the Id of the Bin

Returns false if mapping is not authorized, true otherwise

Return type boolean

**Raise** NullArgument - bin\_id is null

compliance: mandatory – This method must be implemented.

## Bin.get\_assignable\_bin\_ids(bin\_id)

Gets a list of bins including and under the given bin node in which any resource can be assigned.

Parameters bin\_id (osid.id.Id) - the Id of the Bin

Returns list of assignable bin Ids

Return type osid.id.IdList

Raise NullArgument - bin\_id is null

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

## Bin.get\_assignable\_bin\_ids\_for\_resource(bin\_id, resource\_id)

Gets a list of bins including and under the given bin node in which a specific resource can be assigned.

## Parameters

- bin\_id (osid.id.Id) the Id of the Bin
- resource\_id (osid.id.Id) the Id of the Resource

**Returns** list of assignable bin Ids

Return type osid.id.IdList

**Raise** NullArgument - bin\_id or resource\_id is null

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

Bin.assign\_resource\_to\_bin(resource\_id, bin\_id)

Adds an existing Resource to a Bin.

#### Parameters

• resource\_id (osid.id.Id) - the Id of the Resource

• **bin\_id** (osid.id.Id) – the Id of the Bin

Raise AlreadyExists - resource\_id is already assigned to bin\_id

Raise NotFound - resource\_id or bin\_id not found

Raise NullArgument - resource\_id or bin\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Bin.unassign\_resource\_from\_bin (resource\_id, bin\_id) Removes a Resource from a Bin.

#### **Parameters**

- resource\_id (osid.id.Id) the Id of the Resource
- bin\_id (osid.id.Id) the Id of the Bin
- **Raise** NotFound resource\_id or bin\_id not found or resource\_id not assigned to bin\_id

Raise NullArgument - resource\_id or bin\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## **Resource Agent Methods**

## Bin.bin\_id

Gets the Bin Id associated with this session.

Returns the Bin Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

Bin.**bin** 

Gets the Bin associated with this session.

Returns the Bin associated with this session

Return type osid.resource.Bin

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

## Bin.can\_lookup\_resource\_agent\_mappings()

Tests if this user can perform lookups of resource/agent mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known lookup methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer lookup operations to unauthorized users.

Returns false if looking up mappings is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### Bin.use\_comparative\_agent\_view()

The returns from the lookup methods may omit or translate elements based on this session, such as authorization, and not result in an error.

This view is used when greater interoperability is desired at the expense of precision.

compliance: mandatory - This method is must be implemented.

### Bin.use\_plenary\_agent\_view()

A complete view of the Agent returns is desired.

Methods will return what is requested or result in an error. This view is used when greater precision is desired at the expense of interoperability.

compliance: mandatory – This method is must be implemented.

## Bin.use\_federated\_bin\_view()

Federates the view for methods in this session.

A federated view will include resources in bins which are children of this bin in the bin hierarchy.

compliance: mandatory – This method is must be implemented.

## Bin.use\_isolated\_bin\_view()

Isolates the view for methods in this session.

An isolated view restricts lookups to this bin only.

compliance: mandatory - This method is must be implemented.

### Bin.get\_resource\_id\_by\_agent (agent\_id)

Gets the Resource Id associated with the given agent.

Parameters agent\_id (osid.id.Id) - Id of the Agent

Returns associated resource

Return type osid.id.Id

**Raise** NotFound - agent\_id is not found

**Raise** NullArgument - agent\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## Bin.get\_resource\_by\_agent (agent\_id)

Gets the Resource associated with the given agent.

Parameters agent\_id (osid.id.Id) - Id of the Agent

Returns associated resource

Return type osid.resource.Resource

**Raise** NotFound - agent\_id is not found

 $Raise \; \texttt{NullArgument-agent\_id} \; is \; \texttt{null}$ 

Raise OperationFailed - unable to complete request

 $Raise \ {\tt PermissionDenied-authorization\ failure}$ 

compliance: mandatory – This method must be implemented.

- Bin.get\_agent\_ids\_by\_resource(resource\_id)
  - Gets the list of Agent Ids mapped to a Resource.

Parameters resource\_id (osid.id.Id) - Id of a Resource

**Returns** list of agent Ids

Return type osid.id.IdList

Raise NotFound - resource\_id is not found

Raise NullArgument - resource\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

Bin.get\_agents\_by\_resource(resource\_id)

Gets the list of Agents mapped to a Resource.

Parameters resource\_id (osid.id.Id) - Id of a Resource

Returns list of agents

Return type osid.authentication.AgentList

**Raise** NotFound - resource\_id is not found

**Raise** NullArgument - resource\_id is null

Raise OperationFailed - unable to complete request

**Raise** PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## **Resource Agent Assignment Methods**

#### Bin.bin\_id

Gets the Bin Id associated with this session.

Returns the Bin Id associated with this session

Return type osid.id.Id

compliance: mandatory – This method must be implemented.

#### Bin.**bin**

Gets the Bin associated with this session.

Returns the Bin associated with this session

Return type osid.resource.Bin

Raise OperationFailed - unable to complete request

Raise PermissionDenied - authorization failure

#### Bin.can\_assign\_agents()

Tests if this user can alter resource/agent mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known mapping methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer assignment operations to unauthorized users.

**Returns** false if mapping is not authorized, true otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

```
Bin.can_assign_agents_to_resource(resource_id)
```

Tests if this user can alter resource/agent mappings.

A return of true does not guarantee successful authorization. A return of false indicates that it is known location methods in this session will result in a PermissionDenied. This is intended as a hint to an application that may opt not to offer assignment operations to unauthorized users.

Parameters resource\_id (osid.id.Id) - the Id of the Resource

**Returns** false if mapping is not authorized, true otherwise

Return type boolean

**Raise** NullArgument - resource\_id is null

compliance: mandatory – This method must be implemented.

#### Bin.assign\_agent\_to\_resource (agent\_id, resource\_id)

Adds an existing Agent to a Resource.

#### Parameters

- agent\_id (osid.id.Id) the Id of the Agent
- resource\_id (osid.id.Id) the Id of the Resource

**Raise** AlreadyExists - agent\_id is already assigned to resource\_id

**Raise** NotFound - agent\_id or resource\_id not found

**Raise** NullArgument - agent\_id or resource\_id is null

**Raise** OperationFailed – unable to complete request

Raise PermissionDenied - authorization failure

compliance: mandatory – This method must be implemented.

Bin.unassign\_agent\_from\_resource (agent\_id, resource\_id) Removes an Agent from a Resource.

**Parameters** 

- agent\_id (osid.id.Id) the Id of the Agent
- resource\_id (osid.id.Id) the Id of the Resource

Raise NotFound - agent\_id or resource\_id not found or agent\_id not assigned to resource\_id

**Raise** NullArgument - agent\_id or resource\_id is null

Raise OperationFailed - unable to complete request

Raise PermissionDenied – authorization failure

compliance: mandatory – This method must be implemented.

## **Objects**

## Resource

class dlkit.resource.objects.Resource Bases: dlkit.osid.objects.OsidObject

A Resource represents an arbitrary entity.

Resources are used to define an object to accompany an OSID Id used in other OSIDs. A resource may be used to represent a meeting room in the Scheduling OSID, or a student in the Course OSID.

A Resource may also represent a group or organization. A provider may present such a group in an opaque manner through a single resource definition, or the provider may expose the resource collection for examination or manipulation. If such a resource collection is visible, is\_group() is true and can be used in one of the group sessions available in this OSID.

#### is\_group()

Tests if this resource is a group.

A resource that is a group can be used in the group sessions.

**Returns** true if this resource is a group, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### is\_demographic()

Tests if this resource is a demographic.

A resource that is a demographic can be used in the demographic service and the group sessions.

Returns true if this resource is a demographic, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### has\_avatar()

Tests if this resource has an avatar.

Returns true if this resource has an avatar, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### avatar\_id

Gets the asset Id.

**Returns** the asset Id

Return type osid.id.Id

**Raise** IllegalState - has\_avatar() is false

compliance: mandatory – This method must be implemented.

#### avatar

Gets the asset.

Returns the asset

Return type osid.repository.Asset

**Raise** IllegalState - has\_avatar() is false

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

#### get\_resource\_record (resource\_record\_type)

Gets the resource record corresponding to the given Resource record Type.

This method is used to retrieve an object implementing the requested record. The resource\_record\_type may be the Type returned in get\_record\_types() or any of its parents in a Type hierarchy where has\_record\_type (resource\_record\_type) is true.

Parameters resource\_record\_type (osid.type.Type) - the resource record type

**Returns** the resource record

Return type osid.resource.records.ResourceRecord

**Raise** NullArgument - resource\_record\_type is null

Raise OperationFailed - unable to complete request

Raise Unsupported - has\_record\_type (resource\_record\_type) is false

compliance: mandatory – This method must be implemented.

#### **Resource Form**

class dlkit.resource.objects.ResourceForm

Bases: dlkit.osid.objects.OsidObjectForm

This is the form for creating and updating Resources.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the ResourceAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

Resources can be designated as a group. The group metadata indicates if it is possible to convert a resource to a group and vice-versa.

#### group\_metadata

Gets the metadata for a group.

Returns metadata for the group

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

#### group

#### avatar\_metadata

Gets the metadata for an asset.

Returns metadata for the asset

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

#### avatar

get\_resource\_form\_record(resource\_record\_type)

Gets the ResourceFormRecord corresponding to the given Resource record Type.

Parameters resource\_record\_type (osid.type.Type) - the resource record type

Returns the resource form record

Return type osid.resource.records.ResourceFormRecord

**Raise** NullArgument - resource\_record\_type is null

Raise OperationFailed - unable to complete request

**Raise** Unsupported - has\_record\_type(resource\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Resource List**

```
class dlkit.resource.objects.ResourceList
```

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, ResourceList provides a means for accessing Resource elements sequentially either one at a time or many at a time.

Examples: while (rl.hasNext()) { Resource resource = rl.getNextResource(); }

or

```
while (rl.hasNext()) { Resource[] resources = rl.getNextResources(rl.available());
```

}

#### next\_resource

Gets the next Resource in this list.

**Returns** the next Resource in this list. The has\_next() method should be used to test that a next Resource is available before calling this method.

Return type osid.resource.Resource

**Raise** IllegalState – no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

#### get\_next\_resources(n)

Gets the next set of Resources in this list which must be less than or equal to the return from available().

- **Parameters n** (cardinal) the number of Resource elements requested which must be less than or equal to available()
- **Returns** an array of Resource elements. The length of the array is less than or equal to the number specified.

Return type osid.resource.Resource

Raise IllegalState - no more elements available in this list

**Raise** OperationFailed – unable to complete request

## **Resource Node**

class dlkit.resource.objects.ResourceNode
 Bases: dlkit.osid.objects.OsidNode

This interface is a container for a partial hierarchy retrieval.

The number of hierarchy levels traversable through this interface depend on the number of levels requested in the BinHierarchySession.

#### resource

Gets the Resource at this node.

**Returns** the resource represented by this node

Return type osid.resource.Resource

compliance: mandatory – This method must be implemented.

#### parent\_resource\_nodes

Gets the parents of this resource.

**Returns** the parents of the resource

Return type osid.resource.ResourceNodeList

compliance: mandatory – This method must be implemented.

#### child\_resource\_nodes

Gets the children of this resource.

Returns the children of this resource

Return type osid.resource.ResourceNodeList

compliance: mandatory – This method must be implemented.

## **Resource Node List**

class dlkit.resource.objects.ResourceNodeList

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, ResourceNodeList provides a means for accessing ResourceNode elements sequentially either one at a time or many at a time.

Examples: while (rnl.hasNext()) { ResourceNode node = rnl.getNextResourceNode(); }

#### or

while rnl.hasNext()) { ResourceNode[] nodes = rnl.getNextResourceNodes(rnl.available());

#### }

#### next\_resource\_node

Gets the next ResourceNode in this list.

**Returns** the next ResourceNode in this list. The has\_next() method should be used to test that a next ResourceNode is available before calling this method.

Return type osid.resource.ResourceNode

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

#### get\_next\_resource\_nodes (n)

Gets the next set of ResourceNode elements in this list which must be less than or equal to the return from available().

**Parameters n** (cardinal) – the number of ResourceNode elements requested which must be less than or equal to available ()

**Returns** an array of ResourceNode elements. The length of the array is less than or equal to the number specified.

Return type osid.resource.ResourceNode

Raise IllegalState - no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

## Bin

class dlkit.resource.objects.Bin (abc\_resource\_objects.Bin, osid\_objects.OsidCatalog)
:noindex:

#### get\_bin\_record (bin\_record\_type)

Gets the bin record corresponding to the given Bin record Type.

This method is used to retrieve an object implementing the requested record. The bin\_record\_type may be the Type returned in get\_record\_types () or any of its parents in a Type hierarchy where has\_record\_type (bin\_record\_type) is true.

Parameters bin\_record\_type (osid.type.Type) - the bin record type

**Returns** the bin record

Return type osid.resource.records.BinRecord

**Raise** NullArgument - bin\_record\_type is null

**Raise** OperationFailed – unable to complete request

**Raise** Unsupported - has\_record\_type (bin\_record\_type) is false

compliance: mandatory – This method must be implemented.

#### **Bin Form**

class dlkit.resource.objects.BinForm

Bases: dlkit.osid.objects.OsidCatalogForm

This is the form for creating and updating bins.

Like all OsidForm objects, various data elements may be set here for use in the create and update methods in the BinAdminSession. For each data element that may be set, metadata may be examined to provide display hints or data constraints.

get\_bin\_form\_record(bin\_record\_type)

Gets the BinFormRecord corresponding to the given bin record Type.

Parameters bin\_record\_type (osid.type.Type) - the bin record type

Returns the bin form record

Return type osid.resource.records.BinFormRecord
Raise NullArgument - bin\_record\_type is null
Raise OperationFailed - unable to complete request
Raise Unsupported - has\_record\_type (bin\_record\_type) is false

compliance: mandatory – This method must be implemented.

## **Bin List**

#### class dlkit.resource.objects.BinList

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, BinList provides a means for accessing Bin elements sequentially either one at a time or many at a time.

Examples: while (bl.hasNext()) { Bin bin = bl.getNextBin(); }

#### or

while (bl.hasNext()) { Bin[] bins = bl.getNextBins(bl.available());

}

#### next\_bin

Gets the next Bin in this list.

**Returns** the next Bin in this list. The has\_next() method should be used to test that a next Bin is available before calling this method.

Return type osid.resource.Bin

**Raise** IllegalState – no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

#### get\_next\_bins(n)

Gets the next set of Bin elements in this list which must be less than or equal to the return from available().

- **Parameters n** (cardinal) the number of Bin elements requested which must be less than or equal to available()
- **Returns** an array of Bin elements. The length of the array is less than or equal to the number specified.

Return type osid.resource.Bin

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

## **Bin Node**

class dlkit.resource.objects.BinNode

Bases: dlkit.osid.objects.OsidNode

This interface is a container for a partial hierarchy retrieval.

The number of hierarchy levels traversable through this interface depend on the number of levels requested in the BinHierarchySession.

#### bin

Gets the Bin at this node.

**Returns** the bin represented by this node

Return type osid.resource.Bin

compliance: mandatory – This method must be implemented.

#### parent\_bin\_nodes

Gets the parents of this bin.

Returns the parents of the id

Return type osid.resource.BinNodeList

compliance: mandatory – This method must be implemented.

#### child\_bin\_nodes

Gets the children of this bin.

Returns the children of this bin

Return type osid.resource.BinNodeList

compliance: mandatory – This method must be implemented.

## **Bin Node List**

class dlkit.resource.objects.BinNodeList

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, BinNodeList provides a means for accessing BinNode elements sequentially either one at a time or many at a time.

Examples: while (bnl.hasNext()) { BinNode node = bnl.getNextBinNode(); }

#### or

while (bnl.hasNext()) { BinNode[] nodes = bnl.getNextBinNodes(bnl.available());

}

#### next\_bin\_node

Gets the next BinNode in this list.

**Returns** the next BinNode in this list. The has\_next() method should be used to test that a next BinNode is available before calling this method.

Return type osid.resource.BinNode

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

#### get\_next\_bin\_nodes (n)

Gets the next set of BinNode elements in this list which must be less than or equal to the return from available().

**Parameters n** (cardinal) – the number of BinNode elements requested which must be less than or equal to available ()

**Returns** an array of BinNode elements. The length of the array is less than or equal to the number specified.

Return type osid.resource.BinNode

Raise IllegalState - no more elements available in this list

**Raise** OperationFailed – unable to complete request

compliance: mandatory – This method must be implemented.

## Queries

## **Resource Query**

class dlkit.resource.queries.ResourceQuery

 $Bases: \ dlkit.osid.queries.OsidObjectQuery$ 

This is the query for searching resources.

Each method specifies an AND term while multiple invocations of the same method produce a nested OR.

#### match\_group(match)

Matches resources that are also groups.

**Parameters match** (boolean) - true for a positive match, false for a negative match

compliance: mandatory – This method must be implemented.

#### group\_terms

match\_demographic(match)

Matches resources that are also demographics.

**Parameters match** (boolean) - true for a positive match, false for a negative match

compliance: mandatory – This method must be implemented.

#### demographic\_terms

match\_containing\_group\_id(resource\_id, match)

Sets the group Id for this query to match resources within the given group.

#### Parameters

- resource\_id (osid.id.Id) a resource Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - resource\_id is null

compliance: mandatory – This method must be implemented.

## containing\_group\_id\_terms

#### supports\_containing\_group\_query()

Tests if a ResourceQuery is available for querying containing groups.

**Returns** true if a group resource query is available, false otherwise

Return type boolean

## containing\_group\_query

Gets the query for a a containing group.

Multiple retrievals produce a nested OR term.

**Returns** the resource query

Return type osid.resource.ResourceQuery

**Raise** Unimplemented - supports\_containing\_group\_query() is false

compliance: optional – This method must be implemented if "supports\_agent\_query()" is "true".

## match\_any\_containing\_group (match)

Matches resources inside any group.

**Parameters match** (boolean) – true to match any containing group, false to match resources part of no groups

compliance: mandatory – This method must be implemented.

#### containing\_group\_terms

match\_avatar\_id (asset\_id, match)
 Sets the asset Id for this query.

#### **Parameters**

- asset\_id (osid.id.Id) the asset Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - asset\_id is null

compliance: mandatory – This method must be implemented.

#### avatar\_id\_terms

#### supports\_avatar\_query()

Tests if an AssetQuery is available.

**Returns** true if an asset query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### avatar\_query

Gets the query for an asset.

Multiple retrievals produce a nested OR term.

Returns the asset query

Return type osid.repository.AssetQuery

Raise Unimplemented - supports\_avatar\_query() is false

compliance: optional – This method must be implemented if "supports\_avatar\_query()" is "true".

#### match\_any\_avatar (match)

Matches resources with any asset.

**Parameters match** (boolean) - true to match any asset, false to match resources with no asset

compliance: mandatory – This method must be implemented.

#### avatar\_terms

match\_agent\_id (agent\_id, match)

Sets the agent Id for this query.

#### Parameters

- agent\_id (osid.id.Id) the agent Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - agent\_id is null

compliance: mandatory – This method must be implemented.

## agent\_id\_terms

#### supports\_agent\_query()

Tests if an AgentQuery is available.

Returns true if an agent query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### agent\_query

Gets the query for an agent.

Multiple retrievals produce a nested OR term.

**Returns** the agent query

Return type osid.authentication.AgentQuery

Raise Unimplemented - supports\_agent\_query() is false

compliance: optional – This method must be implemented if "supports\_agent\_query()" is "true".

#### match\_any\_agent (match)

Matches resources with any agent.

Parameters match (boolean) - true to match any agent, false to match resources with
 no agent

compliance: mandatory – This method must be implemented.

#### agent\_terms

```
match_resource_relationship_id(resource_relationship_id, match)
```

Sets the resource relationship Id for this query.

#### Parameters

- resource\_relationship\_id (osid.id.Id) the resource relationship Id
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - resource\_relationship\_id is null

compliance: mandatory – This method must be implemented.

#### resource\_relationship\_id\_terms

#### supports\_resource\_relationship\_query()

Tests if a ResourceRelationshipQuery is available.

**Returns** true if a resource relationship query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### resource\_relationship\_query

Gets the query for aa resource relationship.

Multiple retrievals produce a nested OR term.

**Returns** the resource relationship query

Return type osid.resource.ResourceRelationshipQuery

Raise Unimplemented-supports\_resource\_relationship\_query() is false

compliance: optional – This method must be implemented if 'supports\_resource\_relationship\_query()'' is ''true''.

#### match\_any\_resource\_relationship(match)

Matches resources with any resource relationship.

**Parameters match** (boolean) – true to match any resource relationship, false to match resources with no relationship

compliance: mandatory – This method must be implemented.

#### resource\_relationship\_terms

match\_bin\_id (bin\_id, match)
Sets the bin Id for this query.

**Parameters** 

• **bin\_id** (osid.id.Id) - the bin Id

• match (boolean) - true for a positive match, false for a negative match

Raise NullArgument - bin\_id is null

compliance: mandatory – This method must be implemented.

#### bin\_id\_terms

#### supports\_bin\_query()

Tests if a BinQuery is available.

**Returns** true if a bin query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### bin\_query

Gets the query for a bin.

Multiple retrievals produce a nested OR term.

Returns the bin query

Return type osid.resource.BinQuery

Raise Unimplemented - supports\_bin\_query() is false

compliance: optional – This method must be implemented if "supports\_bin\_query()" is "true".

#### bin\_terms

#### get\_resource\_query\_record (resource\_record\_type)

Gets the resource query record corresponding to the given Resource record Type.

Multiple retrievals produce a nested OR term.

Parameters resource\_record\_type (osid.type.Type) - a resource record type
Returns the resource query record
Return type osid.resource.records.ResourceQueryRecord
Raise NullArgument - resource\_record\_type is null
Raise OperationFailed - unable to complete request
Raise Unsupported - has\_record\_type (resource\_record\_type) is false
compliance: mandatory - This method must be implemented.

## **Bin Query**

```
class dlkit.resource.queries.BinQuery
```

Bases: dlkit.osid.queries.OsidCatalogQuery

This is the query for searching bins.

Each method specifies an AND term while multiple invocations of the same method produce a nested OR.

match\_resource\_id (resource\_id, match)
Sets the resource Id for this query.

#### **Parameters**

- resource\_id (osid.id.Id) a resource Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - resource\_id is null

compliance: mandatory – This method must be implemented.

#### resource\_id\_terms

#### supports\_resource\_query()

Tests if a ResourceQuery is available.

**Returns** true if a resource query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

#### resource\_query

Gets the query for a resource.

Multiple retrievals produce a nested OR term.

Returns the resource query

Return type osid.resource.ResourceQuery

**Raise** Unimplemented - supports\_resource\_query() is false

compliance: optional – This method must be implemented if "supports\_resource\_query()" is "true".

#### match\_any\_resource(match)

Matches bins with any resource.

**Parameters match** (boolean) - true to match bins with any resource, false to match bins with no resources

#### resource\_terms

match\_ancestor\_bin\_id(binid, match)

Sets the bin Id for this query to match bins that have the specified bin as an ancestor.

#### **Parameters**

- binid (osid.id.Id) a bin Id
- match (boolean) true for a positive match, false for a negative match

Raise NullArgument - bin\_id is null

compliance: mandatory – This method must be implemented.

#### ancestor\_bin\_id\_terms

#### supports\_ancestor\_bin\_query()

Tests if a BinQuery is available.

**Returns** true if a bin query is available, false otherwise

Return type boolean

*compliance: mandatory – This method must be implemented.* 

## ancestor\_bin\_query

Gets the query for a bin.

Multiple retrievals produce a nested OR term.

**Returns** the bin query

Return type osid.resource.BinQuery

Raise Unimplemented - supports\_ancestor\_bin\_query() is false

compliance: optional – This method must be implemented if ''supports\_ancestor\_bin\_query()'' is ''true''.

#### match\_any\_ancestor\_bin(match)

Matches bins with any ancestor.

Parameters match (boolean) - true to match bins with any ancestor, false to match root
 bins

compliance: mandatory – This method must be implemented.

#### ancestor\_bin\_terms

#### match\_descendant\_bin\_id(binid, match)

Sets the bin Id for this query to match bins that have the specified bin as a descendant.

**Parameters** 

- $\texttt{binid}\left(\texttt{osid.id.Id}\right) a \ bin \ \texttt{Id}$
- match (boolean) true for a positive match, false for a negative match

**Raise** NullArgument - bin\_id is null

compliance: mandatory – This method must be implemented.

#### descendant\_bin\_id\_terms

```
supports_descendant_bin_query()
```

Tests if a BinQuery is available.

Returns true if a bin query is available, false otherwise

Return type boolean

compliance: mandatory – This method must be implemented.

descendant\_bin\_query

Gets the query for a bin.

Multiple retrievals produce a nested OR term.

**Returns** the bin query

Return type osid.resource.BinQuery

Raise Unimplemented - supports\_descendant\_bin\_query() is false

compliance: optional – This method must be implemented if ''supports\_descendant\_bin\_query()'' is ''true''.

#### match\_any\_descendant\_bin (match)

Matches bins with any descendant.

Parameters match (boolean) - true to match bins with any descendant, false to match
leaf bins

compliance: mandatory – This method must be implemented.

#### descendant\_bin\_terms

#### get\_bin\_query\_record (bin\_record\_type)

Gets the bin query record corresponding to the given Bin record Type.

Multiple retrievals produce a nested OR term.

**Parameters bin\_record\_type** (osid.type.Type) - a bin record type

**Returns** the bin query record

Return type osid.resource.records.BinQueryRecord

**Raise** NullArgument - bin\_record\_type is null

Raise OperationFailed - unable to complete request

Raise Unsupported - has\_record\_type (bin\_record\_type) is false

compliance: mandatory – This method must be implemented.

## Records

#### **Resource Record**

class dlkit.resource.records.ResourceRecord Bases: dlkit.osid.records.OsidRecord

A record for a Resource.

The methods specified by the record type are available through the underlying object.

#### **Resource Query Record**

```
class dlkit.resource.records.ResourceQueryRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for a ResourceQuery.

The methods specified by the record type are available through the underlying object.

## **Resource Form Record**

class dlkit.resource.records.ResourceFormRecord Bases: dlkit.osid.records.OsidRecord

A record for a ResourceForm.

The methods specified by the record type are available through the underlying object.

## **Resource Search Record**

class dlkit.resource.records.ResourceSearchRecord Bases: dlkit.osid.records.OsidRecord

A record for a ResourceSearch.

The methods specified by the record type are available through the underlying object.

#### **Bin Record**

```
class dlkit.resource.records.BinRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for a Bin.

The methods specified by the record type are available through the underlying object.

#### **Bin Query Record**

```
class dlkit.resource.records.BinQueryRecord
Bases: dlkit.osid.records.OsidRecord
```

A record for a  $\ensuremath{\mathsf{BinQuery}}$  .

The methods specified by the record type are available through the underlying object.

## **Bin Form Record**

class dlkit.resource.records.BinFormRecord Bases: dlkit.osid.records.OsidRecord

A record for a BinForm.

The methods specified by the record type are available through the underlying object.

#### **Bin Search Record**

class dlkit.resource.records.BinSearchRecord Bases: dlkit.osid.records.OsidRecord

A record for a BinSearch.

The methods specified by the record type are available through the underlying object.

# Туре

## Summary

Type Open Service Interface Definitions type version 3.0.0

The Type OSID defines a set of interfaces for managing Type definitions. Types are used as an identifier primarily for identification of interface extensions throughout the OSIDs and occasionally used as an extensible enumeration. An agreement between an OSID Consumer and an OSID Provider means they support the same Type.

## Types

A Type is similar to an Id but includes other data for display and organization. The identification portion of the Type is globally unique and contains:

- authority: the name of the entity or organization responsible for the type. Using a domain name is a reasonable convention.
- identifier: a string serving as an id. The identifier may be a urn, guid, oid or some other means of identification. Since all of the identification elements including the domain and authority create an overall unique Type, the identifier may even be a sequence number defined within a particular domain.
- namespace: a string identifying the namespace of the identifier, such as "urn" or "oid".

## Example

**Type type = lookupSession.getType("asset", "uri",** "http://harvestroad.com/osidTypes/image", "harve-stroad.com");

print type.getDisplayName();

The sessions in this OSID offer the capabilities of a  $T_{ype}$  registry to centrally manage definitions and localized display strings and descriptions. Applications may opt to construct their own  $T_{ypes}$  directly and bypass this service.

## Type Hierarchies

Types are part of an internal hierarchy. A Type in a hierarchy includes the Types of its children. For example, an Asset may have a "photograph" Type included as part of an "image" base Type.

Unless an application will display a type, it can simply construct a type based on the identification components. OSID Providers may benefit by using this service to manage the type hierarchy, to provide a place to perform mappings across different type definitions, and to provide displayable metadata to its consumers.

## Type Type Relations

Types may relate to other Types to describe constraints or compositions. The relationship is expressed as another Type. For example, a Position of type "researcher" may be appropriately associated with an Organization of type "laboratory" using a relation Type of "allowed." Or, a root Event type depends on a root TimePeriod type using a relationship type of "depends on."

## Types for Constraints and Side Effects

An OSID Provider may link a Type, such as a genus, to a set of constraints that are made known to the application as Metadata through an OsidForm. Types of an OsidObject may also be used by an OSID Provider to constrain the possible relationship Types that may be possible to that OsidObject. In these uses of Types, there is a semantic accompanying the Type definition managed within an OSID Provider. The Type OSID manages the metadata of the Type itself. Logic implementing the meaning of the Type is managed completely within an OSID Provider.

OSIDs emphasize relationships over data typing since type agreements are often an impediment to interoperability. Generally, the rule of thumb for record  $T_{ypes}$  is to first explore other OsidObjects, even those in other OSIDs

for a place for extra data. Often, what is hiding behind a list of data elements is a separate service that can be provided as a separate module and serves to keep the principal OsidObject lighter and more flexible.

Genus Types primarily serve as a quick and dirty way to unclutter the record Types with "is kind of like" tags. OsidCatalogs can be used for a richer solution. For example, a genus Type may be used to identify all Events on a Calendar which are classes at a school and is accompanied by constraint logic such that the Events occur at a Location on campus.

Another pathway to explore is to create a smart Calendar from an EventQuery that specifies constraints on the Event sponsor, Location, or other data required for classes. Creates and updates for Events in that smart Calendar will be similarly constrained and surfaced to the OSID Consumer through the Metadata in the Event-Forms. While this path is certainly more difficult than simply nailing up some logic indexed by a genus Type, it can be considered if there is a need to expose the logic and authoring capabilities.

## OsidPrimitives

Most OSID interfaces are used to encapsulate implementation-specific objects from provider to consumer. Type is an OsidPrimitive and as such cannot be used to encapsulate implementation-specific data other than what is defined explicitly in the Type. An OSID Provider must respect any Type constructed by an OSID Consumer. Type Open Service Interface Definitions type version 3.0.0

The Type OSID defines a set of interfaces for managing Type definitions. Types are used as an identifier primarily for identification of interface extensions throughout the OSIDs and occasionally used as an extensible enumeration. An agreement between an OSID Consumer and an OSID Provider means they support the same Type.

## Types

A Type is similar to an Id but includes other data for display and organization. The identification portion of the Type is globally unique and contains:

- authority: the name of the entity or organization responsible for the type. Using a domain name is a reasonable convention.
- identifier: a string serving as an id. The identifier may be a urn, guid, oid or some other means of identification. Since all of the identification elements including the domain and authority create an overall unique Type, the identifier may even be a sequence number defined within a particular domain.
- namespace: a string identifying the namespace of the identifier, such as "urn" or "oid".

## Example

**Type type = lookupSession.getType("asset", "uri",** "http://harvestroad.com/osidTypes/image", "harve-stroad.com");

print type.getDisplayName();

The sessions in this OSID offer the capabilities of a  $T_{ype}$  registry to centrally manage definitions and localized display strings and descriptions. Applications may opt to construct their own  $T_{ypes}$  directly and bypass this service.

## Type Hierarchies

Types are part of an internal hierarchy. A Type in a hierarchy includes the Types of its children. For example, an Asset may have a "photograph" Type included as part of an "image" base Type.

Unless an application will display a type, it can simply construct a type based on the identification components. OSID Providers may benefit by using this service to manage the type hierarchy, to provide a place to perform mappings across different type definitions, and to provide displayable metadata to its consumers.

## Type Type Relations

Types may relate to other Types to describe constraints or compositions. The relationship is expressed as another Type. For example, a Position of type "researcher" may be appropriately associated with an Organization of

type "laboratory" using a relation Type of "allowed." Or, a root Event type depends on a root TimePeriod type using a relationship type of "depends on."

Types for Constraints and Side Effects

An OSID Provider may link a Type, such as a genus, to a set of constraints that are made known to the application as Metadata through an OsidForm. Types of an OsidObject may also be used by an OSID Provider to constrain the possible relationship Types that may be possible to that OsidObject. In these uses of Types, there is a semantic accompanying the Type definition managed within an OSID Provider. The Type OSID manages the metadata of the Type itself. Logic implementing the meaning of the Type is managed completely within an OSID Provider.

OSIDs emphasize relationships over data typing since type agreements are often an impediment to interoperability. Generally, the rule of thumb for record Types is to first explore other OsidObjects, even those in other OSIDs for a place for extra data. Often, what is hiding behind a list of data elements is a separate service that can be provided as a separate module and serves to keep the principal OsidObject lighter and more flexible.

Genus Types primarily serve as a quick and dirty way to unclutter the record Types with "is kind of like" tags. OsidCatalogs can be used for a richer solution. For example, a genus Type may be used to identify all Events on a Calendar which are classes at a school and is accompanied by constraint logic such that the Events occur at a Location on campus.

Another pathway to explore is to create a smart Calendar from an EventQuery that specifies constraints on the Event sponsor, Location, or other data required for classes. Creates and updates for Events in that smart Calendar will be similarly constrained and surfaced to the OSID Consumer through the Metadata in the Event-Forms. While this path is certainly more difficult than simply nailing up some logic indexed by a genus Type, it can be considered if there is a need to expose the logic and authoring capabilities.

## OsidPrimitives

Most OSID interfaces are used to encapsulate implementation-specific objects from provider to consumer. Type is an OsidPrimitive and as such cannot be used to encapsulate implementation-specific data other than what is defined explicitly in the Type. An OSID Provider must respect any Type constructed by an OSID Consumer.

## **Service Managers**

## **Type Profile**

```
class dlkit.services.type.TypeProfile
Bases: dlkit.osid.managers.OsidProfile
```

The TypeProfile describes the interoperability among type services.

## **Type Manager**

class dlkit.services.type.TypeManager (proxy=None)
Bases: dlkit.osid.managers.OsidManager, dlkit.osid.sessions.OsidSession,
dlkit.services.type.TypeProfile

This manager provides access to the available sessions of the type service.

The TypeLookupSession is used for looking up Types and the TypeAdminSession is used for managing and registering new Types.

## **Type Methods**

## **Type Methods**

## **Type Proxy Methods**

Methods

TypeManager.display\_name

TypeManager.display\_label

TypeManager.description

TypeManager.domain

#### TypeManager.authority

Gets the authority of this Type.

The authority is a string used to ensure the uniqueness of this Type when using a non-federated identifier space. Generally, it is a domain name identifying the party responsible for this Type. This method is used to compare one Type to another.

Returns the authority of this Type

Return type string

compliance: mandatory – This method must be implemented.

#### TypeManager.namespace

Gets the namespace of the identifier.

This method is used to compare one Type to another.

Returns the authority of this Type

Return type string

compliance: mandatory – This method must be implemented.

#### TypeManager.identifier

Gets the identifier of this Type.

This method is used to compare one Type to another.

Returns the identifier of this Type

Return type string

compliance: mandatory – This method must be implemented.

## **Type Methods**

TypeManager.display\_name\_metadata Gets the metadata for the display name.

Returns metadata for the display name

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

TypeManager.display\_name

TypeManager.display\_label\_metadata Gets the metadata for the display label.

**Returns** metadata for the display label

Return type osid.Metadata

*compliance: mandatory – This method must be implemented.* 

TypeManager.display\_label

TypeManager.description\_metadata Gets the metadata for the description.

**Returns** metadata for the description

**Return type** osid.Metadata

compliance: mandatory – This method must be implemented.

TypeManager.description

TypeManager.domain\_metadata Gets the metadata for the domain.

Returns metadata for the domain

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

TypeManager.domain

#### **Type Methods**

TypeManager.next\_type

Gets the next Type in this list.

**Returns** the next Type in this list. The has\_next() method should be used to test that a next Type is available before calling this method.

Return type osid.type.Type

**Raise** IllegalState – no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

## TypeManager.get\_next\_types(n)

Gets the next set of Types in this list.

The specified amount must be less than or equal to the return from available().

- **Parameters n** (cardinal) the number of Type elements requested which must be less than or equal to available()
- **Returns** an array of Type elements. The length of the array is less than or equal to the number specified.

Return type osid.type.Type

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

## **Primitives**

## Туре

```
class dlkit.type.primitives.Type
    Bases: dlkit.osid.markers.OsidPrimitive
```

The Type is a form of identifier that is primarily used to identify interface specifications.

The Type differs from Id in that it offers display information and Types may be arranged in hierarchies to indicate an extended interface. Semantically, an Id identifies any OSID object while the Type identifies a specification.

The components of the Type that make up its identification are:

•identifier: a unique key or guid

•namespace: the namespace of the identifier

•authority: the isuer of the identifier

Persisting a type reference means to persist the above identification elements. In addition to these identifier components, A Type mai also provide some additional metadata such as a name, description and domain.

#### display\_name

Gets the full display name of this Type.

Returns the display name of this Type

Return type osid.locale.DisplayText

compliance: mandatory – This method must be implemented.

#### display\_label

Gets the shorter display label for this Type.

Where a display name of a Type might be " Critical Logging Priority Type", the display label could be "critical".

**Returns** the display label for this Type

Return type osid.locale.DisplayText

compliance: mandatory – This method must be implemented.

#### description

Gets a description of this Type.

**Returns** the description of this Type

Return type osid.locale.DisplayText

compliance: mandatory – This method must be implemented.

#### domain

Gets the domain.

The domain can provide an information label about ths application space of this Type.

Returns the domain of this Type

Return type osid.locale.DisplayText

#### authority

Gets the authority of this Type.

The authority is a string used to ensure the uniqueness of this Type when using a non-federated identifier space. Generally, it is a domain name identifying the party responsible for this Type. This method is used to compare one Type to another.

Returns the authority of this Type

Return type string

compliance: mandatory – This method must be implemented.

#### namespace

Gets the namespace of the identifier.

This method is used to compare one Type to another.

Returns the authority of this Type

Return type string

compliance: mandatory – This method must be implemented.

#### identifier

Gets the identifier of this Type.

This method is used to compare one Type to another.

Returns the identifier of this Type

Return type string

compliance: mandatory – This method must be implemented.

## **Objects**

#### **Type Form**

```
class dlkit.type.objects.TypeForm
```

Bases: dlkit.osid.objects.OsidForm

This form provides a means of updating various fields in the Type.

Note that the domain, authority and identifier are part of the Type identification, and as such not modifiable.

#### display\_name\_metadata

Gets the metadata for the display name.

**Returns** metadata for the display name

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

## display\_name

#### display\_label\_metadata

Gets the metadata for the display label.

**Returns** metadata for the display label

Return type osid.Metadata

display\_label

#### description\_metadata

Gets the metadata for the description.

Returns metadata for the description

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

## description

#### domain\_metadata

Gets the metadata for the domain.

Returns metadata for the domain

Return type osid.Metadata

compliance: mandatory – This method must be implemented.

domain

## **Type List**

```
class dlkit.type.objects.TypeList
```

Bases: dlkit.osid.objects.OsidList

Like all OsidLists, TypeList provides a means for accessing Type elements sequentially either one at a time or many at a time.

Examples: while (tl.hasNext()) { Type type = tl.getNextType(); }

or

while (tl.hasNext()) { Type[] types = tl.getNextTypes(tl.available());

}

#### next\_type

Gets the next Type in this list.

**Returns** the next Type in this list. The has\_next () method should be used to test that a next Type is available before calling this method.

Return type osid.type.Type

Raise IllegalState - no more elements available in this list

Raise OperationFailed - unable to complete request

compliance: mandatory – This method must be implemented.

#### get\_next\_types (n)

Gets the next set of Types in this list.

The specified amount must be less than or equal to the return from available().

- **Parameters n** (cardinal) the number of Type elements requested which must be less than or equal to available ()
- **Returns** an array of  $T_{ype}$  elements. The length of the array is less than or equal to the number specified.

Return type osid.type.Type

 $\label{eq:result} Raise \ {\tt IllegalState-no} \ more \ elements \ available \ in \ this \ list$ 

**Raise** OperationFailed – unable to complete request

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