Content Management Interoperability Services (CMIS) Version 1.0 + Errata 1

OASIS Standard

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Abstract:

The Content Management Interoperability Services (CMIS) standard defines a domain model and Web Services and Restful AtomPub bindings that can be used by applications to work with one or more Content Management repositories/systems.

The CMIS interface is designed to be layered on top of existing Content Management systems and their existing programmatic interfaces. It is not intended to prescribe how specific features should be implemented within those CM systems, not to exhaustively expose all of the CM system~~’~~'s capabilities through the CMIS interfaces. Rather, it is intended to define a generic/universal set of capabilities provided by a CM system and a set of services for working with those capabilities.

Status:

This document was last revised or approved by the CMIS TC on the above date. The level of approval is also listed above. Check the ~~“~~"Latest Version~~”~~" or ~~“~~"Latest Approved Version~~”~~" location noted above for possible later revisions of this document.

Technical Committee members should send comments on this specification to the Technical Committee~~’~~'s email list. Others should send comments to the Technical Committee by using the ~~“~~"Send A Comment~~”~~" button on the Technical Committee~~’~~'s web page at http://www.oasis-open.org/committees/cmis/.

For information on whether any patents have been disclosed that may be essential to implementing this specification, and any offers of patent licensing terms, please refer to the Intellectual Property Rights section of the Technical Committee web page (http://www.oasis-open.org/committees/cmis/ipr.php).

The non-normative errata page for this specification is located at http://www.oasis-open.org/committees/cmis/.

Notices

Table of Contents

1 Introduction

The Content Management Interoperability Services (CMIS) standard defines a domain model and set of bindings that include Web Services and ReSTful AtomPub that can be used by applications to work with one or more Content Management repositories/systems.

The CMIS interface is designed to be layered on top of existing Content Management systems and their existing programmatic interfaces. It is not intended to prescribe how specific features should be implemented within those CM systems, nor to exhaustively expose all of the CM system~~’~~'s capabilities through the CMIS interfaces. Rather, it is intended to define a generic/universal set of capabilities provided by a CM system and a set of services for working with those capabilities.

1.1 Terminology

The key words ~~“~~"MUST~~”~~", ~~“~~"MUST NOT~~”~~", ~~“~~"REQUIRED~~”~~", ~~“~~"SHALL~~”~~", ~~“~~"SHALL NOT~~”~~", ~~“~~"SHOULD~~”~~", ~~“~~"SHOULD NOT~~”~~", ~~“~~"RECOMMENDED~~”~~", ~~“~~"MAY~~”~~", and ~~“~~"OPTIONAL~~”~~" in this document are to be interpreted as described in RFC2119.

1.2 Normative References

[RFC4287]	M. Nottingham, R. Sayre, *Atom Syndication Format*, http://www.ietf.org/rfc/rfc4287.txt, December 2005
[RFC5023]	J. Gregorio, B. de hOra, *Atom Publishing Protocol*, http://www.ietf.org/rfc/rfc5023.txt, October 2007
[RFC2616]	R. Fielding, J. Gettys, J. Mogul, H. Frystyk, L. Masinter, P. Leach, T. Berners-Lee, *Hypertext Transfer Protocol --HTTP/1.1*, http://www.ietf.org/rfc/rfc2616.txt, June 1999
[RFC2119]	S. Bradner, *Key words for use in RFCs to Indicate Requirement Levels*, http://www.ietf.org/rfc/rfc2119.txt, March 1997
[RFC4918]	L. Dusseault, *HTTP Extensions for Web Distributed Authoring and Versioning (WebDAV),* June 2007
[RFC3986]	T. Berners-Lee, R. Fielding, L. Masinter, *Unified Resource Identifier*, January 2005
[ID-Brown]	J. Reschke Editor, A. Brown, G. Clemm, *Link Relation Types for Simple Version Navigation between Web Resources*, http://www.ietf.org/id/draft-brown-versioning-link-relations-07.txt, 2010
[ID-WebLinking]	M. Nottingham, *Web Linking*, http://tools.ietf.org/id/draft-nottingham-http-link-header-07.txt, 2010

1.3 Non-Normative References

2 Domain Model

2.1 Data Model

CMIS provides an interface for an application to access a ***Repository***. To do so, CMIS specifies a core data model that defines the *persistent* information entities that are managed by the repository, and specifies a set of basic services that an application can use to access and manipulate these entities. In accordance with the CMIS objectives, this data model does not cover *all* the concepts that a full-function ECM repository typically supports. Specifically, transient entities (such as programming interface objects), administrative entities (such as user profiles), and extended concepts (such as compound or virtual document, work flow and business process, event and subscription) are not included.

However, when an application connects to a CMIS service endpoint, the same endpoint MAY provide access to more than one CMIS repository. (How an application obtains a CMIS service endpoint is outside the scope of CMIS. How the application connects to the endpoint is a part of the protocol that the application uses.) An application MUST use the CMIS ~~“~~"Get Repositories~~”~~" service (*getRepositories*) to obtain a list of repositories that are available at that endpoint. The Repository Identity MUST uniquely identify an available repository at this service endpoint. Both the repository name and the repository identity are opaque to CMIS. Aside from the ~~“~~"Get Repositories~~”~~" service, all other CMIS services are single-repository-scoped, and require a Repository Identity as an input parameter. In other words, except for the ~~“~~"Get Repositories~~”~~" service, multi-repository and inter-repository operations are not supported by CMIS.

2.1.1 Repository

The repository itself is described by the CMIS ~~“~~"Get Repository Information~~”~~" service. The service output is fully described in section 2.2.2.2 getRepositoryInfo.

2.1.1.1 Optional Capabilities

Commercial ECM repositories vary in their designs. Moreover, some repositories are designed for a specific application domain and may not provide certain capabilities that are not needed for their targeted domain. Thus, a repository implementation may not necessarily be able to support all CMIS capabilities. A few CMIS capabilities are therefore ~~“~~"optional~~”~~" for a repository to be compliant. A repository~~’~~'s support for each of these optional capabilities is discoverable using the *getRepositoryInfo* service. The following is the list of these optional capabilities. All capabilities are ~~“~~"Boolean~~”~~" (i.e. the Repository either supports the capability entirely or not at all) unless otherwise noted.

Navigation Capabilities:

`capabilityGetDescendants`

Ability for an application to enumerate the descendants of a folder via the getDescendants service.

See section: 2.2.3.2 getDescendants

`capabilityGetFolderTree`

Ability for an application to retrieve the folder tree via the getFolderTree service.

See section: 2.2.3.3 getFolderTree

Object Capabilities:

`capabilityContentStreamUpdatability` (**`enumCapabilityContentStreamUpdates`**)

Indicates the support a repository has for updating a document’~~'~~s content stream. Valid values are:

- **`none:`** The content stream may never be updated.
- **`anytime:`** The content stream may be updated any time.

`pwconly:` The content stream may be updated only when checked out. The abbreviation PWC is described in section 0

Versioning

- ~~Versioning~~.

See Section: 2.1.4.1 Content Stream~~Content Stream~~

`capabilityChanges` (**`enumCapabilityChanges`**)

Indicates what level of changes (if any) the repository exposes via the “~~"~~change log”~~"~~ service. Valid values are:

- **`none:`** The repository does not support the change log feature.
- **`objectidsonly:`** The change log can return only the ObjectIDs for changed objects in the repository and an indication of the type of change, not details of the actual change.
- **`properties`**: The change log can return properties and the ObjectID for the changed objects
- **`all`**: The change log can return the ObjectIDs for changed objects in the repository and more information about the actual change

See Section: 2.1.11 Change Log

`capabilityRenditions` (**`enumCapabilityRendition`**)

Indicates whether or not the repository exposes renditions of document or folder objects.

- **`none:`** The repository does not expose renditions at all.
- **`read:`** Renditions are provided by the repository and readable by the client.

Filing Capabilities:

`capabilityMultifiling`

Ability for an application to file a document or other file-able object in more than one folder

See Section: 2.1.5 Folder Object

`capabilityUnfiling`

Ability for an application to leave a document or other file-able object not filed in any folder

See Section: 2.1.5 Folder Object

`capabilityVersionSpecificFiling`

Ability for an application to file individual versions (i.e., not all versions) of a document in a folder

See Section: 0

Versioning

~~Versioning~~

Versioning Capabilities:

`capabilityPWCUpdatable`

Ability for an application to update the “"Private Working Copy”" of a checked-out document

See Section: 0

Versioning

~~Versioning~~

`capabilityPWCSearchable`

Ability of the Repository to include the ""Private Working Copy"" of checked-out documents in query search scope; otherwise PWC's are not searchable

See Section: 0

Versioning

~~Versioning~~

`capabilityAllVersionsSearchable`

Ability of the Repository to include all versions of document.If False, typically either the latest or the latest major version will be searchable.

See Section: 0

Versioning

~~Versioning~~

Query Capabilities:

`capabilityQuery` (**`enumCapabilityQuery`**)

Indicates the types of queries that the Repository has the ability to fulfill. Query support levels are:

- **`none`:** No queries of any kind can be fulfilled.
- **`metadataonly`:** Only queries that filter based on object properties can be fulfilled. Specifically, the CONTAINS() predicate function is not supported.
- **`fulltextonly`:** Only queries that filter based on the full-text content of documents can be fulfilled. Specifically, only the CONTAINS() predicate function can be included in the WHERE clause.
- **`bothseparate`:** The repository can fulfill queries that filter EITHER on the full-text content of documents OR on their properties, but NOT if both types of filters are included in the same query.
- **`bothcombined`:** The repository can fulfill queries that filter on both the full-text content of documents and their properties in the same query.

See Section: 2.1.10 Query

`capabilityJoin` (**`enumCapabilityJoin`**)

Indicates the types of JOIN keywords that the Repository can fulfill in queries. Support levels are:

- **`none`:** The repository cannot fulfill any queries that include any JOIN clauses.
- **`inneronly`:** The repository can fulfill queries that include an INNER JOIN clause, but cannot fulfill queries that include other types of JOIN clauses.

- **`innerandouter`:** The repository can fulfill queries that include any type of JOIN clause defined by the CMIS query grammar.

See Section: 2.1.10 Query

ACL Capabilities:

`capabilityACL (enumCapabilityACL)`

Indicates the level of support for ACLs by the repository

- **`none`**: The repository does not support ACL services
- **`discover`**: The repository supports discovery of ACLs (getACL and other services)
- **`manage`**: The repository supports discovery of ACLs AND applying ACLs (getACL and applyACL services)

See Section: 2.8 Access Control

2.1.1.2 Implementation Information

The “"Get Repository Information”" service MUST also return implementation information including vendor name, product name, product version, version of CMIS that it supports, the root folder ID (see section 2.1.5.2 Folder Hierarchy), and MAY include other implementation-specific information. The version of CMIS that the repository supports MUST be expressed as a Decimal that matches the specification version.

2.1.2 Object

The entities managed by CMIS are modeled as typed ***Objects***. There are four base types of objects: ***Document Objects***, ***Folder Objects***, ***Relationship Objects***, and ***Policy Objects***.

- A *document object* represents a standalone information asset. Document objects are the elementary entities managed by a CMIS repository.
- A *folder object* represents a logical container for a collection of “"file-able”" objects, which include folder objects and document objects. Folder objects are used to organize file-able objects. Whether or not an object is file-able is specified in its object-type definition.
- A *relationship object* represents an instance of directional relationship between two objects. The support for relationship objects is optional, and may be discovered via the “"Get Type Children”" service.
- A *policy* object represents an administrative policy, which may be “"applied”" to one or more “"controllablePolicy”" objects. Whether or not an object is controllable is specified in its object-type definition. The support for policy objects is optional, and may be discovered via the “"Get Type Children”" service.

Additional object-types MAY be defined in a repository as subtypes of these base types. CMIS services are provided for the discovery of object-types that are defined in a repository. However, object-type management services, such as the creation, modification, and deletion of an object-type, are outside the scope of CMIS.

Every CMIS object has an opaque and immutable ***Object Identity*** (ID), which is assigned by the repository when the object is created. An ID uniquely identifies an object within a repository regardless of the type of the object. Repositories SHOULD assign IDs that are “"permanent”" – that is, they remain unchanged during the lifespan of the identified objects, and they are never reused or reassigned after the objects are deleted from the repository.

Every CMIS object has a set of named, but not explicitly ordered, ***Properties***. (However, a Repository SHOULD always return object properties in a consistent order.) Within an object, each property is uniquely identified by its property definition id.

In addition, a document object MAY have a ***Content-Stream***, which may be used to hold a raw digital asset such as an image or a word-processing document. A repository MUST specify, in each object-type definition, whether document objects of that type MAY, MUST, or MUST NOT have a content-stream. A document MAY also have one or more ***Renditions*** associated with it. A rendition can be a thumbnail or an alternate representation of the content stream.

Document or folder objects MAY have one ***Access Control List*** (ACL), which controls access to the document or folder. A policy object may also control access to the document or folder. An ACL represents a list of ***Access Control Entries*** (ACEs). An ACE in turn represents one or more permissions being granted to a ***principal*** (a user, group, role, or something similar).

The notion of localization of the objects in the data model is entirely repository specific.

CMIS objects MAY expose additional information, such as vendor-specific workflow data, beyond the attributes described above. In this respect, the data model can be extended as desired. This specification does not standardize such extensions.

2.1.2.1 Property

A property MAY hold zero, one, or more typed data value(s). Each property MAY be *single-valued* or *multi-valued*. A single-valued property contains a single data value, whereas a multi-valued property contains an ordered list of data values of the same type. The ordering of values in a multi-valued property MAY be preserved by the repository.

~~If a value is not provided for a property, the property is in a “*value not set*” state. There is no “null” value for a property. Through protocol binding, a property is either not set, or is set to a particular value or a list of values.~~ A property, either single-valued or multi-valued, MAY be in a "not set" state. CMIS does not support "null" property value.

If a multi-valued property is not in a "not set" state, its property value MUST be a non-empty list of individual values. Each individual value in the list MUST NOT be in a "not set" state and MUST conform to the property's property-type.

A multi-valued property is either set or not set in its entirety. An individual value of a multi-valued property MUST NOT be in an individual ~~“~~"value not set~~”~~" state and hold a position in the list of values. An empty list of values MUST NOT be allowed.

Every property is typed. The Property-type defines the data type of the data value(s) held by the property. CMIS specifies the following Property-types. They include the following data types defined by ~~“~~"XML Schema Part 2: Datatypes Second Edition~~”~~" (W3C Recommendation, 28 October 2004, http://www.w3.org/TR/xmlschema-2/):

- `string` (xsd:string)
- `boolean` (xsd:boolean)
- `decimal` (see section 2.1.3.3.5 Attributes specific to Decimal Object-Type Property Definitions)
- `integer` (xsd:integer)
- `datetime` (xsd:dateTime and see section 2.1.3.3.5 Attributes specific to Decimal Object-Type Property Definitions)
- `uri` (xsd:anyURI)

In addition, the following Property-Types are also specified by CMIS:

- `id`
- `html`

Individual protocol bindings MAY override or re-specify these property types.

All properties MUST supply a String **`queryName`** attribute which is used for query and filter operations on object-types. This is an opaque String with limitations. This string SHOULD NOT contain any characters that negatively interact with the BNF grammar.

The string MUST NOT contain:

- whitespace ~~“~~" ~~“~~",
- comma ~~“~~",~~”~~"
- double quotes ~~“~~'~~”~~"~~”~~'
- single quotes ~~“~~"~~’~~'~~”~~"
- backslash ~~“~~"\~~”~~"
- the period ~~“~~".~~”~~" character or,
- the open ~~“~~"(~~“~~" or close ~~“~~")~~”~~" parenthesis characters.

2.1.2.1.1 ID Property

An ID property holds a system-generated, read-only identifier, such as an Object ID, an Object-Type ID, etc. (The ID Property-Type is NOT defined by xsd:id.) The lexical representation of an ID is an opaque string. As such, an ID cannot be assumed to be interpretable syntactically or assumed to be to be collate-able with other IDs, and can only be used in its entirety as a single atomic value. When used in a query predicate, an ID can only participate in an ~~“~~"equal~~”~~" or a ~~“~~"not equal~~”~~" comparison with a string literal or with another ID.

While all CMIS identities share the same Property-Type, they do not necessarily share the same address space. Unless explicitly specified, ID properties NEED NOT maintain a referential integrity constraint. Therefore, storing the ID of one object in another object NEED NOT constrain the behavior of either object. A repository MAY, however, support referential constraint underneath CMIS if the effect on CMIS services remains consistent with an allowable behavior of the CMIS model. For example, a repository MAY return an exception when a CMIS service call violates an underlying referential constraint maintained by the repository. In that case, an error message SHOULD be returned to the application to describe the cause of exception and suggest a remedial action. The content of such messages is outside the scope of CMIS.

2.1.2.1.2 HTML Property

An HTML property holds a document or fragment of Hypertext Markup Language (HTML) content. HTML properties are not guaranteed to be validated in any way. The validation behavior is entirely repository specific.

2.1.3 Object-Type

An ***Object-Type*** defines a fixed and non-hierarchical set of properties (“~~"~~schema”~~"~~) that all objects of that type have. This schema is used by a repository to validate objects and enforce constraints, and is also used by a user to compose object-type-based (structured) queries.

All CMIS objects are strongly typed. If a property not specified in an object’~~'~~s object-type definition is supplied by an application, an exception SHOULD be thrown.

Each object-type is uniquely identified within a repository by a system-assigned and immutable ***Object-Type Identifier***, which is of type ID.

A CMIS repository MUST expose exactly one collection of Object-Types via the “~~"~~Repository”~~"~~ services *(getTypeChildren, getTypeDescendants, getTypeDefinition).*

While a repository MAY define additional object-types beyond the CMIS Base Object-Types, these Object-Types MUST NOT extend or alter the behavior or semantics of a CMIS service (for example, by adding new services). A repository MAY attach additional constraints to an object-type underneath CMIS, provided that the effect visible through the CMIS interface is consistent with the allowable behavior of CMIS.

2.1.3.1 Object-Type Hierarchy and Inheritance

Hierarchy and ***Inheritance*** for Object-Types are supported by CMIS in the following manner:

- A CMIS repository MUST have these base types:
  - *cmis:document* object-type
  - *cmis:folder* object-type
- A CMIS repository MAY have these base types:
  - *cmis:relationship* object-type
  - *cmis:policy* object-type
- Additional base types MUST NOT exist. Additional object-types MAY be defined as sub-types or descendant types of these four base types.
- A ***Base Type*** does not have a parent type.
- A non-base type has one and only one parent type. An object-type’~~'~~s ***Parent Type*** is a part of the object-type definition.
- An object-type definition includes a set of object-type attributes (e.g. Fileable, Queryable, etc.) and a property schema that will apply to Objects of that type.
  - There is no inheritance of object-type attributes from a parent object-type to its sub-types.
- The properties of a CMIS base type MUST be inherited by its descendant types.
- A ***Child Type*** whose immediate parent is NOT its base type SHOULD inherit all the property definitions that are specified for its parent type. In addition, it MAY have its own property definitions.
  - If a property is NOT inherited by a subtype, the exhibited behavior for query MUST be as if the value of this property is “~~"~~not set”~~"~~ for all objects of this sub-type.
- The scope of a query on a given object-type is automatically expanded to include all the ***Descendant Types*** of the given object-type with the attribute `includedInSuperTypeQuery` equals TRUE. This was added for synthetic types as well as to support different type hierarchies that are not necessarily the same as CMIS. Only the properties of the given object-type,

including inherited ones, MUST be used in the query. Properties defined for its descendant types MAY NOT be used in the query, and CAN NOT be returned by the query.

- ○ If a property of its parent type is not inherited by this type, the property MUST still appear as a column in the corresponding virtual table in the relational view, but this column MUST contain a NULL value for all objects of this type. (See section 2.1.10 Query.)

2.1.3.2 Object-Type Attributes

2.1.3.2.1 Attributes common to ALL Object-Type Definitions

All ***Object-Type Definitions*** MUST contain the following ***attributes***:

`id` ID

This opaque attribute identifies this object-type in the repository.

`localName` String~~ (optional)~~

This attribute represents the underlying repository~~’~~'s name for the object-type. This field is opaque and has no uniqueness constraint imposed by this specification.

Two properties with the same localName and localNamespace MUST have the same semantic equality.

`localNamespace` String (optional)

This attribute allows repositories to represent the internal namespace of the underlying repository~~’~~'s name for the object-type.

`queryName` String

Used for query and filter operations on object-types. This is an opaque String with limitations. This string SHOULD NOT contain any characters that negatively interact with the BNF grammar.

The string MUST NOT contain:

- whitespace ~~“~~" ~~“~~",
- comma ~~“~~",~~”~~"
- double quotes ~~‘~~'~~”~~"~~’~~'
- single quotes ~~“~~"~~’~~'~~”~~"
- backslash ~~“~~"\~~”~~"
- the period ~~“~~".~~”~~" character or,
- the open ~~“~~"(~~“~~" or close ~~“~~")~~”~~" parenthesis characters.

`displayName` String (optional)

Used for presentation by application.

`baseId` Enum

A value that indicates whether the base type for this Object-Type is the Document, Folder, Relationship, or Policy base type.

`parentId` ID

The ID of the Object-Type~~’~~'s immediate parent type.

It MUST be ~~“~~"not set~~”~~" for a base type.

description String (optional)

Description of this object-type, such as the nature of content, or its intended use. Used for presentation by application.

creatable Boolean

Indicates whether new objects of this type MAY be created. If the value of this attribute is FALSE, the repository MAY contain objects of this type already, but MUST NOT allow new objects of this type to be created.

fileable Boolean

Indicates whether or not objects of this type are file-able.

queryable Boolean

Indicates whether or not this object-type can appear in the FROM clause of a query statement. A non-queryable object-type is not visible through the relational view that is used for query, and CAN NOT appear in the FROM clause of a query statement.

controllablePolicy Boolean

Indicates whether or not objects of this type are controllable via policies. Policy objects can only be applied to controllablePolicy objects.

controllableACL Boolean

This attribute indicates whether or not objects of this type are controllable by ACL~~’~~'s. Only objects that are controllableACL can have an ACL.

fulltextIndexed Boolean

Indicates whether objects of this type are indexed for full-text search for querying via the CONTAINS() query predicate.

includedInSupertypeQuery Boolean

Indicates whether this type and its subtypes appear in a query of this type~~’~~'s ancestor types.

For example: if Invoice is a sub-type of cmis:document, if this is TRUE on Invoice then for a query on cmis:document, instances of Invoice will be returned if they match.

If this attribute is FALSE, no instances of Invoice will be returned even if they match the query.

2.1.3.3 Object-Type Property Definitions

Besides these object-type attributes, an object-type definition SHOULD contain inherited property definitions and zero or more additional property definitions. All the properties of an object, including inherited properties, MUST be retrievable through the ~~“~~"get~~”~~" services, and MAY appear in the SELECT clause of a query.

2.1.3.3.1 Property Types

Property types are defined in section 2.1.2.1 Property.

2.1.3.3.2 Attributes common to ALL Object-Type Property Definitions

All ***Object-Type Property Definitions*** MUST contain the following ***attributes***:

id ID

This opaque attribute uniquely identifies the property in the repository. If two Object-Types each contain property definitions with the same ID, those property definitions are the same.

localName String (optional)

This attribute represents the underlying repository~~’~~'s name for the property. This field is opaque and has no uniqueness constraint imposed by this specification.

localNamespace String (optional)

This attribute allows repositories to represent the internal namespace of the underlying repository~~’~~'s name for the property.

queryName String

Used for query operations on properties. This is an opaque String with limitations. Please see `queryName` in Object-Type Attributes for the limitations on what characters are not allowed.

displayName String (optional)

Used for presentation by application.

description String (optional)

This is an optional attribute containing a description of the property

propertyType Enum

This attribute indicates the type of this property. It MUST be one of the allowed property types. (See section 2.1.2.1 Property.)

cardinality Enum

Indicates whether the property can have ~~“~~"zero or one~~”~~" or ~~“~~"zero or more~~”~~" values.

Values:

- **single**: Property can have zero or one values (if property is not required), or exactly one value (if property is required)
- **multi**: Property can have zero or more values (if property is not required), or one or more values (if property is required).

Repositories SHOULD preserve the ordering of values in a multi-valued property. That is, the order in which the values of a multi-valued property are returned in get operations SHOULD be the same as the order in which they were supplied during previous create/update operation.

updatability Enum

Indicates under what circumstances the value of this property MAY be updated.

Values:

- **readonly:** The value of this property MUST NOT ever be set directly by an application. It is a system property that is either maintained or computed by the repository.
  - The value of a readOnly property MAY be indirectly modified by other repository interactions (for example, calling “"updateProperties”" on an object will change the object'’s last modified date, even though that property cannot be directly set via an updateProperties() service call.)
- **readwrite:** The property value can be modified using the *updateProperties* service.
- ~~1.~~ **whencheckedout:** The property value MUST only be update-able using a “"private working copy”" Document.
  - ~~a.~~ I.e. the update is either made on a “"private working copy”" object or made using a “"check in”" service.
- ~~2.~~ **oncreate:** The property value MUST only be update-able during the Create operation on that Object.

inherited Boolean

Indicates whether the property definition is inherited from the parent-type when TRUE or it is explicitly defined for this object-type when FALSE.

required Boolean

This attribute is only applicable to non-sytem properties, i.e. properties whose value is provided by the application.

If TRUE, then the value of this property MUST never be set to the “"not set”" state when an object of this type is created/updated. If not provided during a create or update operation, the repository MUST provide a value for this property.

If a value is not provided, then the default value defined for the property MUST be set. If no default value is provided and no default value is defined, the repository MUST throw an exception.

This attribute is not applicable when the “"updatability”" attribute is “"readonly”". In that case, “"required”" SHOULD be set to FALSE.

Note: For CMIS-defined object types, the value of a system property (such as cmis:objectId, cmis:createdBy) MUST be set by the repository. However, the property'’s “"required”" attribute SHOULD be FALSE because it is read-only to applications.

queryable Boolean

Indicates whether or not the property MAY appear in the WHERE clause of a CMIS query statement.

This attribute MUST have a value of FALSE if the Object-type'’s attribute for “"Queryable”" is set to FALSE.

orderable Boolean

Indicates whether the property can appear in the ORDER BY clause of a CMIS query statement or an ORDERBY parameter.

This property MUST be FALSE for any property whose cardinality is “"multi”".

choices <PropertyChoiceType list> (multi-valued)

Indicates an explicit ordered set of single values allowed for this property.

If the cardinatity of the property definition is ~~“~~"single~~”~~" and the ~~“~~"openChoice~~”~~" attribute is FALSE, then the property value MUST be at most one of the values listed in this attribute.

If the cardinatity of the property definition is ~~“~~"single~~”~~" and the ~~“~~"openChoice~~”~~" attribute is TRUE, then the property value MAY be one of the values listed in this attribute.

If the cardinatity of the property definition is ~~“~~"multi~~”~~" and the ~~“~~"openChoice~~”~~" attribute is FALSE, then the property value MUST be zero, one or more than one of the values listed in this attribute.

If the cardinatity of the property definition is ~~“~~"multi~~”~~" and the ~~“~~"openChoice~~”~~" attribute is TRUE, then the property value MAY be zero, one, or more than one of the values listed in this attribute.If this attribute is ~~“~~"not set~~”~~", then any valid value for this property based on its type may be used.

Each choice includes a displayName and a value. The displayName is used for presentation purpose. The value will be stored in the property when selected.

Choices MAY be hierarchically presented. For example: a value of ~~“~~"choices~~”~~" for a geographic location would be represented as follows:

- Europe:
    - England
    - France
    - Germany
- North America
    - Canada
    - USA
    - Mexico

openChoice Boolean

This attribute is only applicable to properties that provide a value for the ~~“~~"Choices~~”~~" attribute.

If FALSE, then the data value for the property MUST only be one of the values specified in the ~~“~~"Choices~~”~~" attribute. If TRUE, then values other than those included in the ~~“~~"Choices~~”~~" attribute may be set for the property.

defaultValue <PropertyType>

The value that the repository MUST set for the property if a value is not provided by an application when the object is created.

If no default value is specified and an application creates an object of this type without setting a value for the property, the repository MUST attempt to store a ~~“~~"value not set~~”~~" state for the property value. If this occurs for a property that is defined to be required, then the creation attempt MUST throw an exception.

The attributes on the default value element are the same as the attributes on the property definition.

2.1.3.3.3 Attributes specific to Integer Object-Type Property Definitions

The following Object ***attributes*** MUST only apply to Property-Type definitions whose *propertyType* is ~~“~~"Integer~~”~~", in addition to the common attributes specified above. A repository MAY provide additional guidance on what values can be accepted. If the following attributes are not present the repository behavior is undefined and it MAY throw an exception if a runtime constraint is encountered.

minValue Integer

The minimum value allowed for this property.

If an application tries to set the value of this property to a value lower than minValue, the repository MUST throw a **`constraint`** exception.

`maxValue` Integer

The maximum value allowed for this property.

If an application tries to set the value of this property to a value higher than maxValue, the repository MUST throw a **`constraint`** exception.

2.1.3.3.4 Attributes specific to DateTime Object-Type Property Definitions

The following Object ***attributes*** MUST only apply to Property-Type definitions whose *propertyType* is “~~"~~DateTime”~~"~~, in addition to the common attributes specified above. A repository MAY provide additional guidance on what values can be accepted. If the following attributes are not present the repository behavior is undefined and it MAY throw an exception if a runtime constraint is encountered.

`resolution` `String` Enumeration

This is the precision in bits supported for values of this property. Valid values for this attribute are:

- Year: Year resolution is persisted
- Date: Date resolution is persisted
- Time: Time resolution is persisted

2.1.3.3.5 Attributes specific to Decimal Object-Type Property Definitions

The following Object ***attributes*** MUST only apply to Property-Type definitions whose *propertyType* is “~~"~~Decimal”~~"~~, in addition to the common attributes specified above. A repository MAY provide additional guidance on what values can be accepted. If the following attributes are not present the repository behavior is undefined and it MAY throw an exception if a runtime constraint is encountered.

`precision` Integer Enumeration

This is the precision in bits supported for values of this property. Valid values for this attribute are:

- 32: 32-bit precision (“~~"~~single”~~"~~ as specified in IEEE-754-1985).
- 64: 64-bit precision (“~~"~~double”~~"~~ as specified in IEEE-754-1985.)

`minValue` Decimal

The minimum value allowed for this property.

If an application tries to set the value of this property to a value lower than minValue, the repository MUST throw a **`constraint`** exception.

`maxValue` Decimal

The maximum value allowed for this property.

If an application tries to set the value of this property to a value higher than maxValue, the repository MUST throw a **`constraint`** exception.

2.1.3.3.6 Attributes specific to String Object-Type Property Definitions

The following Object ***attributes*** MUST only apply to Property-Type definitions whose *propertyType* is “~~"~~String”~~"~~, in addition to the common attributes specified above. A repository MAY provide additional guidance on what values can be accepted. If the following attributes are not present the repository behavior is undefined and it MAY throw an exception if a runtime constraint is encountered.

`maxLength` Integer

The maximum length (in characters) allowed for a value of this property.

If an application attempts to set the value of this property to a string larger than the specified maximum length, the repository MUST throw a **`constraint`** exception.

2.1.4 Document Object

Document objects are the elementary information entities managed by the repository.

Depending on its Object-type definition, a Document Object may be:

- **Version-able:** Can be acted upon via the Versioning Services (for example: *checkOut, checkIn)*.
- **File-able:** Can be filed in zero, one, or more than one folder via the Multi-filing services.
- **Query-able:** Can be located via the Discovery Services (*query*).
- **Controllable-Policy:** Can have Policies applied to it (see section 2.1.7 Policy Object.)
- **Controllable-ACL:** Can have an ACL applied to it (see section 2.8 Access Control)

Additionally, whether a Document object MUST, MAY or MUST NOT have a content-stream is specified in its object-type definition. A Document Object MAY be associated with zero or more renditions.

Note: When a document is versioned, each version of the document is a separate document object. Thus, for document objects, an object ID actually identifies a specific version of a document.

2.1.4.1 Content Stream

A content-stream is a binary stream. Its maximum length is repository-specific. Each content-stream has a ***MIME Media Type***, as defined by RFC2045 and RFC2046. A content-stream~~’~~'s attributes are represented as properties of the content-stream~~’~~'s containing document object. There is no MIME-type-specific attribute or name directly associated with the content-stream outside of the document object.

CMIS provides basic CRUD services for content-stream, using the ID of a content-stream~~’~~'s containing document object for identification. A content stream also has a streamId which is used for access to the stream. The ~~“~~"Set Content-Stream~~”~~" service (*setContentStream*) either creates a new content-stream for a document object or replaces an existing content-stream. The ~~“~~"Get Content-Stream~~”~~" service (*getContentStream*) retrieves a content-stream. The ~~“~~"Delete Content-Stream~~”~~" service (*deleteContentStream*) deletes a content-stream from a document object. In addition, the ~~“~~"CreateDocument~~”~~" and ~~“~~"Check-in~~”~~" services MAY also take a content-stream as an optional input. A content stream MUST be specified if required by the type definition. These are the only services that operate on content-stream. The ~~“~~"Get Properties~~”~~" and ~~“~~"Query~~”~~" services, for example, do not return a content-stream.

~~“~~"Set Content-Stream~~”~~" and ~~“~~"Delete Content-Stream~~”~~" services are considered modifications to a content-stream~~’~~'s containing document object, and SHOULD therefore change the object~~’~~'s *LastModificationDate* property upon successful completion.

The ability to set or delete a content stream is controlled by the `capabilityContentStreamUpdatability` capability.

2.1.4.2 Renditions

Some ECM repositories provide a facility to retrieve alternative representations of a document. These alternative representations are known as renditions. This could apply to a preview case which would enable the client to preview the content of a document without needing to download the full content. Previews are generally reduced fidelity representations such as thumbnails. Renditions can take on any general form, such as a PDF version of a word document.

A CMIS repository MAY expose zero or more renditions for a document or folder in addition to a document’s content stream. CMIS provides no capability to create or update renditions accessed through the rendition services. Renditions are specific to the version of the document or folder and may differ between document versions. Each rendition consists of a set of rendition attributes and a rendition stream. Rendition attributes are not object properties, and are not queryable. They can be retrieved using the getRenditions service. A rendition stream can be retrieved using the getContentStream service with the rendition’s streamId parameter.

2.1.4.2.1 Rendition Attributes

A rendition has the following attributes:

`streamId` ID

Identifies the rendition stream.

`mimeType` String

The MIME type of the rendition stream.

`length` Integer (optional)

The length of the rendition stream in bytes.

`title` String (optional)

Human readable information about the rendition.

`kind` String

A categorization String associated with the rendition.

`height` Integer (optional)

Typically used for “image” renditions (expressed as pixels). SHOULD be present if kind = `cmis:thumbnail`.

`width` Integer (optional)

Typically used for “image” renditions (expressed as pixels). SHOULD be present if kind = `cmis:thumbnail`.

`renditionDocumentId` ID (optional)

If specified, then the rendition can also be accessed as a document object in the CMIS services. If not set, then the rendition can only be accessed via the rendition services. Referential integrity of this ID is repository-specific.

2.1.4.2.2 Rendition Kind

A Rendition may be categorized via its `kind`. The repository is responsible for assigning kinds to Renditions, including custom kinds. A repository kind does not necessarily identify a single Rendition for a given Object.

CMIS defines the following kind:

- **`cmis:thumbnail`**: A rendition whose purpose is to a provide an image preview of the document without requiring the client to download the full document content stream. Thumbnails are generally reduced fidelity representations.

2.1.4.3 Document Object-Type Definition

This section describes the definition of the Document Object-Type~~'~~'s attribute values and property definitions which must be present on Document instance objects. All attributes and property definitions are listed by their ID.

2.1.4.3.1 Attributes specific to Document Object-Types

The following Object ***attributes*** MUST only apply to Object-Type definitions whose baseId is the cmis:document Object-Type, in addition to the common attributes specified above:

`versionable` Boolean

Indicates whether or not objects of this type are version-able. (See section 0

Versioning

~~Versioning~~.)

`contentStreamAllowed` Enum

A value that indicates whether a content-stream MAY, MUST, or MUST NOT be included in objects of this type. Values:

- **`notallowed`**: A content-stream MUST NOT be included
- **`allowed`**: A content-stream MAY be included
- **`required`**: A content-stream MUST be included (i.e. MUST be included when the object is created, and MUST NOT be deleted.)

2.1.4.3.2 Attribute Values

The Document Object-Type MUST have the following attribute values.

Notes:

- A value of <repository-specific> indicates that the value of the property MAY be set to any valid value for the attribute type.
- Unless explicitly stated otherwise, all values specified in the list MUST be followed for the Object-Type definition.

`id`

Value: cmis:document

`localName`

Value: <repository-specific>

localNamespace

Value: <repository-specific>

queryName

Value: cmis:document

displayName

Value: <repository-specific>

baseId

Value: cmis:document

parentId

Value: Not set

description

Value: <repository-specific>

creatable

Value: <repository-specific>

fileable

Value: TRUE

queryable

Value: SHOULD be TRUE

controllablePolicy

Value: <repository-specific>

includedInSupertypeQuery

Value: <repository-specific>

versionable

Value: <repository-specific>

contentStreamAllowed

Value: <repository-specific>

controllableACL

Value: <repository-specific>

fulltextIndexed

Value: <repository-specific>

2.1.4.3.3 Property Definitions

The Document base Object-Type MUST have the following property definitions, and MAY include additional property definitions. Any attributes not specified for the property definition are repository specific. For all property definitions on base types, the query name MUST be the same as the property ID. The repository MUST have the following property definitions on the Document Type:

cmis:name	Name of the object
Inherited:	False
Property Type:	String
Cardinality:	Single

cmis:objectId	Id of the object
Required:	False
Inherited:	False
Property Type:	ID
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them

cmis:baseTypeId	Id of the base object-type for the object
Required:	False
Inherited:	False
Property Type:	ID
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them

cmis:objectTypeId	Id of the object''s type
Required:	True
Inherited:	False
Property Type:	ID
Cardinality:	Single
Updatability:	oncreate
Choices:	Not Applicable
Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them

cmis:createdBy	User who created the object.
Required:	False
Inherited:	False
Property Type:	String
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable
Queryable:	True
Orderable:	True

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them

cmis:creationDate	DateTime when the object was created.
Required:	False
Inherited:	False
Property Type:	DateTime
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable
Queryable:	True
Orderable:	True

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them

cmis:lastModifiedBy	User who last modified the object.
Required:	False
Inherited:	False
Property Type:	String
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable
Queryable:	True
Orderable:	True

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them

cmis:lastModificationDate	DateTime when the object was last modified.

Required:	False
Inherited:	False
Property Type:	DateTime
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable
Queryable:	True
Orderable:	True

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them

cmis:changeToken Opaque token used for optimistic locking & concurrency checking. (see section 2.2.1.3 Change Tokens)

Required:	False
Inherited:	False
Property Type:	String
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

~~Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them~~Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them. If the repository does not support change tokens, this property SHOULD not be set.

cmis:isImmutable TRUE if the repository MUST throw an error at any attempt to update or delete the object.

Required:	False
Inherited:	False
Property Type:	Boolean
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them

cmis:isLatestVersion See section 0

Versioning

~~Versioning~~.

Required:	False
Inherited:	False
Property Type:	Boolean

Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them. Version Property Values are repository-specific when a document is defined as non-versionable.

cmis:isMajorVersion See section 0

Versioning

~~Versioning~~.

Required:	False
Inherited:	False
Property Type:	Boolean
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them. Version Property Values are repository-specific when a document is defined as non-versionable.

cmis:isLatestMajorVersion See section 0

Versioning

~~Versioning~~.

Required:	False
Inherited:	False
Property Type:	Boolean
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them. Version Property Values are repository-specific when a document is defined as non-versionable.

cmis:versionLabel See section 0

Versioning

~~Versioning~~.

Required:	False
Inherited:	False
Property Type:	String
Cardinality:	Single
Updatability:	Read Only

Choices:	Not Applicable
Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them. Version Property Values are repository-specific when a document is defined as non-versionable.

cmis:versionSeriesId See section 0

Versioning

~~Versioning~~.

Required:	False
Inherited:	False
Property Type:	ID
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them. Version Property Values are repository-specific when a document is defined as non-versionable.

cmis:isVersionSeriesCheckedOut See section 0

Versioning

~~Versioning~~.

Required:	False
Inherited:	False
Property Type:	Boolean
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them. Version Property Values are repository-specific when a document is defined as non-versionable.

cmis:versionSeriesCheckedOutBy See section 0

Versioning

~~Versioning~~.

Required:	False
Inherited:	False
Property Type:	String
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

Version Property Values are repository-specific when a document is defined as non-versionable.

cmis:versionSeriesCheckedOutId See section 0
Versioning
~~Versioning~~.

Required:	False
Inherited:	False
Property Type:	ID
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

Version Property Values are repository-specific when a document is defined as non-versionable.

cmis:checkinComment See section 0
Versioning
~~Versioning~~.

Required:	False
Inherited:	False
Property Type:	String
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

Version Property Values are repository-specific when a document is defined as non-versionable.

cmis:contentStreamLength Length of the content stream (in bytes).

Required:	False
Inherited:	False
Property Type:	Integer
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them and if the document has a content stream

cmis:contentStreamMimeType MIME type of the Content Stream

Required:	False
Inherited:	False
Property Type:	String
Cardinality:	Single
Updatability:	Read Only

Choices:	Not Applicable
Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them and if the document has a content stream

cmis:contentStreamFileName	File name of the Content Stream
Required:	False
Inherited:	False
Property Type:	String
Cardinality:	Single

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them and if the document has a content stream

cmis:contentStreamId	Id of the stream
Required:	False
Inherited:	False
Property Type:	ID
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

2.1.5 Folder Object

A folder object serves as the anchor for a collection of *file-able* objects. The folder object has an *implicit* hierarchical relationship with each object in its collection, with the anchor folder object being the ***Parent*** object and each object in the collection being a ***Child*** object. This implicit relationship has specific containment semantics which MUST be maintained by the repository with implicit referential integrity. (That is, there will never be a dangling parent-relationship or a dangling child-relationship. Furthermore, object A is a parent of object B if and only if object B is a child of object A.) This system-maintained implicit relationship is distinct from an *explicit* relationship which is instantiated by an application-maintained Relationship Object. (See section 2.1.6 Relationship Object.)

A folder object does not have a content-stream and is not version-able. A folder object MAY be associated with zero or more renditions (see section 2.1.4.2 Renditions).

2.1.5.1 File-able Objects

A *file-able* object is one that MAY be ~~“~~"filed~~”~~" into a folder. That is, it MAY be a child object of a folder object. The following list defines whether the base CMIS Object-types are file-able:

cmis:folder

MUST be file-able

cmis:document

MUST be file-able

cmis:relationship

MUST NOT be file-able

cmis:policy

MAY be file-able

2.1.5.1.1 Document Version Series and Filing

Since document objects are versionable, a document object~~’~~'s membership in a folder MAY be version-specific or version-independent. That is, the folder membership MAY be restricted to that particular version of the document or MAY apply to all versions of the document. Whether or not a repository supports version-specific filing is discoverable via the ~~“~~"Get Repository Information~~”~~" service (*getRepositoryInfo*).

When the child objects of a folder are retrieved, a specific version of a document MAY be returned. If the repository supports version-specific filing, the specific version filed in that folder is returned. If the repository does not support version-specific filing, the latest version of the document is returned.

Likewise, this version sensitivity in child-binding also affects the behavior of parent retrieval for a document object, as well as the scope of the IN_FOLDER() and IN_TREE() function calls in a query. For non-versionable fileable objects, their membership in a folder does not have version sensitivity.

2.1.5.1.2 Filing Restrictions by Object-Type

A folder collection~~’~~'s membership MAY be restricted by object-type. Each folder object has a multi-valued *AllowedChildObjectTypeIDs* property, which specifies that only objects of these types are allowed to be its children. If this property is ~~“~~"not set~~”~~", then objects of any file-able type MAY be filed in the Folder. It is repository-specific if subtypes of the types listed in the *AllowedChildObjectTypeIDs* property MAY be filed in the folder.

Because of these filing constraints, when a new folder object is created, an existing folder object MUST be specified as its parent.

When a non-file-able object is created, a parent folder MUST NOT be specified.

When a file-able object is deleted, it is removed from any folder collection in which the object is a member. In other words, when an object is deleted, all implicit parent-child relationships with the deleted object as a child cease to exist.

2.1.5.2 Folder Hierarchy

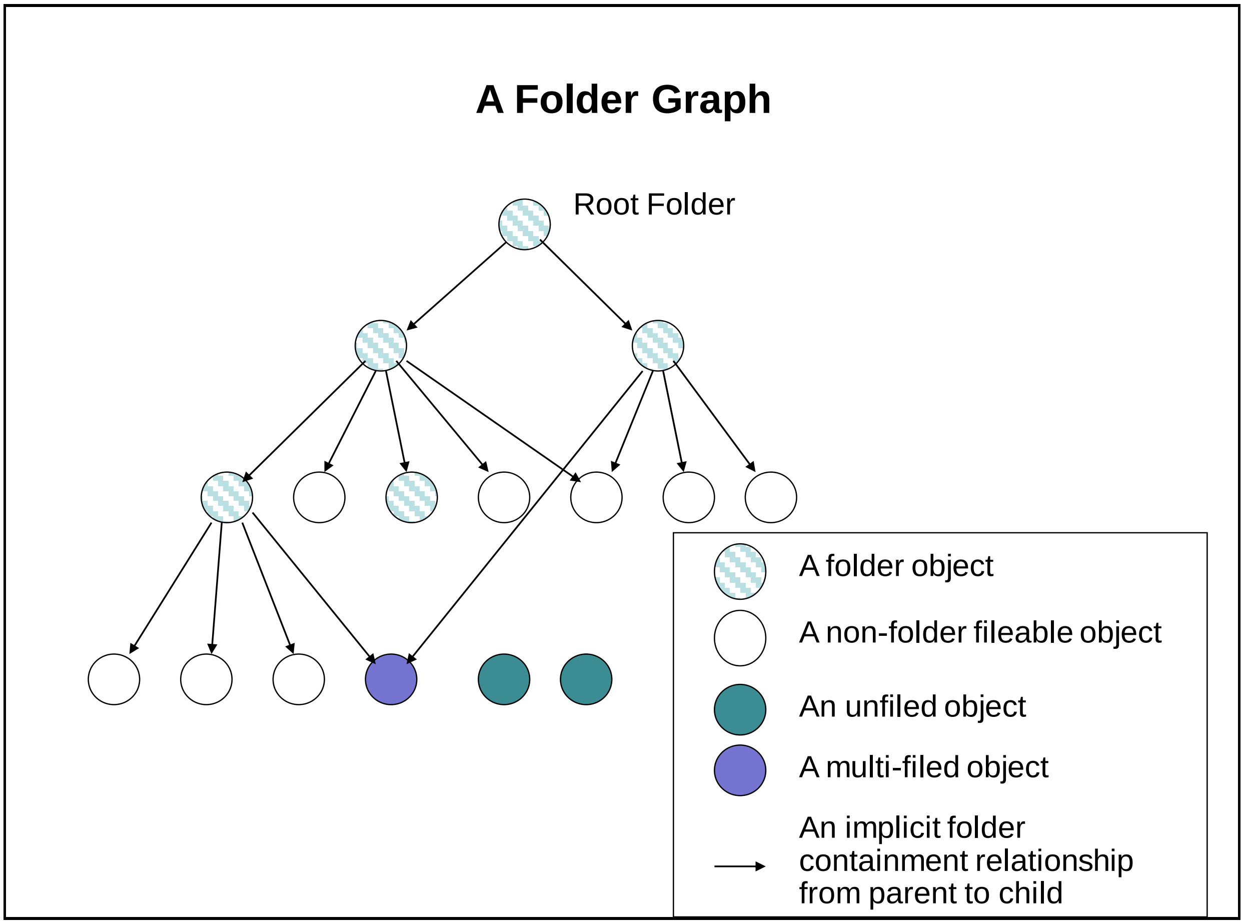
CMIS imposes the following constraints on folder objects:

- Every folder object, except for one which is called the ***Root Folder***, MUST have one and only one parent folder. The Root Folder does not have a parent.
- A cycle in folder containment relationships is not allowed. That is, a folder object cannot have itself as one of its descendant objects.
- A child object that is a folder object can itself be the parent object of other file-able objects.

With these constraints, the folder objects in a CMIS repository necessarily form a strict hierarchy, with the Root Folder being the root of the hierarchy.

The child objects of a given folder object, their child objects, and grandchild objects, etc., are called ***Descendant*** objects of the given folder objectA folder object together with all its descendant objects are collectively called a ***Tree*** rooted at that folder object.

A non-folder object does not have any descendant object. Thus, a ***Folder Graph*** that consists of all fileable objects as nodes, and all the implicit folder containment relationships as directed edges from parent to child, is a directed acyclic graph, possibly with some disconnected (orphan) nodes. It follows that the tree rooted at any given folder object is also a directed acyclic graph, although a non-folder object in the tree MAY have ancestors that are not ancestors of the rooted folder.


A Folder Graph
Root Folder
▨ A folder object
○ A non-folder fileable object
● An unfiled object
● A multi-filed object
→ An implicit folder containment relationship from parent to child

Folder objects are handled using the basic CRUD services for objects, and the folder graph is traversed using the Navigation Services.

The ***Root Folder*** is a special folder such that it cannot be created, deleted, or moved using CMIS services. Otherwise, it behaves like any other folder object.

2.1.5.3 Paths

A folder hierarchy MAY be represented in a canonical notation such as path. For CMIS, a path is represented by:

- “/” for the root folder
- All paths start with the root folder.
- A set of the folder and object path segments separated by “/” in order of closest to the root.
- Folder and object path segments are specified by pathSegment tokens which can be retrieved by all services that take an `includePathSegments` parameter.
- A pathSegment token MUST not include a “/” character.

  - It is repository specific how a repository chooses the value for pathSegment. Repositories might choose to use cmis:name or content stream filename for pathSegment token.
- The pathSegment token for each item MUST uniquely identify the item in the folder.

E.g., if folder A is under the root, and folder B is under A, then the path would be /A/B.

A path for an object may be calculated by taking the item~~’~~'s parent folder cmis:path property and appending the ~~“~~"/~~”~~" character and the object~~’~~'s pathSegment. This constructed path may be given as input to the *getObjectByPath* service for object by path retrieval.

The *getObjectParents* service returns `relativePathSegment` tokens. These tokens are the pathSegment of the input object relative to the parent folders.

2.1.5.4 Folder Object-Type Definition

This section describes the definition of the Folder Object-Type~~’~~'s attribute values and property definitions which must be present on Folder instance objects. All attributes and property definitions are listed by their ID.

2.1.5.4.1 Attribute Values

The Folder Object-Type MUST have the following attribute values.

Notes:

- A value of <repository-specific> indicates that the value of the property MAY be set to any valid value for the attribute type.
- Unless explicitly stated otherwise, all values specified in the table MUST be followed for the Object-Type definition.

id

Value: cmis:folder

localName

Value: <repository-specific>

localNamespace

Value: <repository-specific>

queryName

Value: cmis:folder

displayName

Value: <repository-specific>

baseId

Value: cmis:folder

parentId

Value: Not set

`description`

Value: <repository-specific>

`creatable`

Value: <repository-specific>

`fileable`

Value: TRUE

`queryable`

Value: SHOULD be TRUE

`controllablePolicy`

Value: <repository-specific>

`includedInSupertypeQuery`

Value: <repository-specific>

`controllableACL`

Value: <repository-specific>

`fulltextIndexed`

Value: <repository-specific>

2.1.5.4.2 Property Definitions

The Folder base Object-Type MUST have the following property definitions, and MAY include additional property definitions. Any attributes not specified for the Property Definition are repository specific. For all property definitions on base types, the query name MUST be the same as the property ID. The repository MUST have the following property definitions on the Folder Type:

cmis:name	Name of the object
Inherited:	False
Property Type:	String
Cardinality:	Single
Required:	True

cmis:objectId	Id of the object
Required:	False
Inherited:	False
Property Type:	ID
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable

Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them

cmis:baseTypeId	Id of the base object-type for the object
Required:	False
Inherited:	False
Property Type:	ID
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them

cmis:objectTypeId	Id of the object~~’~~'s type
Required:	~~False~~True
Inherited:	False
Property Type:	ID
Cardinality:	Single
Updatability:	oncreate
Choices:	Not Applicable
Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them

cmis:createdBy	User who created the object.
Required:	False
Inherited:	False
Property Type:	String
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable
Queryable:	True
Orderable:	True

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them

cmis:creationDate	DateTime when the object was created.
Required:	False
Inherited:	False
Property Type:	DateTime

Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable
Queryable:	True
Orderable:	True

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them

cmis:lastModifiedBy	User who last modified the object.
Required:	False
Inherited:	False
Property Type:	String
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable
Queryable:	True
Orderable:	True

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them

cmis:lastModificationDate	DateTime when the object was last modified.
Required:	False
Inherited:	False
Property Type:	DateTime
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable
Queryable:	True
Orderable:	True

MUST be set on the object

cmis:changeToken	Token used for optimistic locking & concurrency checking. (see section 2.2.1.3 Change Tokens)
Required:	False
Inherited:	False
Property Type:	String
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

~~Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them~~Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them. If the repository does not support change tokens, this property SHOULD not be set.

cmis:parentId	ID of the parent folder of the folder.
Required:	False
Inherited:	False
Property Type:	ID
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them

cmis:path	The fully qualified path to this folder. See section 2.1.5.3 Paths.
Required:	False
Inherited:	False
Property Type:	String
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them

cmis:allowedChildObjectTypeIds	Id~~’~~'s of the set of Object-types that can be created, moved or filed into this folder.
Required:	False
Inherited:	False
Property Type:	ID
Cardinality:	Multi
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

2.1.6 Relationship Object

A relationship object is semantically a *dependent* object. A relationship object MUST NOT have a content-stream, and MUST NOT be versionable, MAY be queryable, and MUST NOT be fileable, although it MAY be controllable.

If a repository does not support relationship objects, the relationship base object-type SHOULD NOT be returned by a ~~“~~"Get Types~~”~~" service call.

A ***Relationship Object*** instantiates an explicit, binary, directional, non-invasive, and typed relationship between a ***Source Object*** and a ***Target Object***. The source object and the target object MUST both be independent objects, such as a document object, a folder object, or a policy object. Whether a policy object is allowed to be the source or target object of a relationship object is repository-specific.

The relationship instantiated by a relationship object is *explicit* since it is explicitly represented by an object and is explicitly managed by application.

This relationship is *non-invasive* in the sense that creating or removing this relationship SHOULD NOT modify either the source or the target object. That is, it SHOULD NOT require an update capability (or permission) on either object; SHOULD NOT affect the versioning state of either object; and SHOULD NOT change their ~~“~~"Last Modification Date~~”~~".

Explicit relationships can be used to create an arbitrary relationship graph among independent objects. Such a relationship graph is only structural in nature. No inheritance or transitive properties are attached to a relationship graph.

The notion of a source object and a target object of a relationship is used solely to indicate the direction of the relationship. No semantics or implementation bias is implied by this terminology.

The binding of a relationship object to a source document object or to a target document object MAY be either version-specific or version-independent. This version sensitivity is repository-specific, and is largely transparent to CMIS. An independent object MAY participate in any number of explicit relationships, as the source object for some and as the target object for others. Multiple relationships MAY exist between the same pair of source and target objects.

Referential integrity, either between the source object and the target object, or between the relationship object and the source or target object, is repository-specific. Therefore, creating an explicit relationship between two objects MAY impose a constraint on any of the three objects, and removing a relationship or deleting either the source or the target object MAY be restricted by such a constraint. If the source or the target object of a relationship is deleted, the repository MAY automatically delete the relationship object.

Like all CMIS objects, relationship objects are typed. Typing relationship allows them to be grouped, identified, and traversed by type id, and for properties to be defined for individual relationship types.

Additionally, a relationship object-type MAY specify that only Objects of a specific Object-Type can participate as the source object or target object for relationship objects of that type. If no such constraints are specified, then an independent object of any type MAY be the source or the target of a relationship object of that type.

When a relationship object is created, the source object ID and the target object ID MUST reference valid non-relationship CMIS objects.

When a relationship object is retrieved, its source object or target object MAY no longer exist, since referential integrity MAY not be maintained by a repository.

In addition to object CRUD services, a ~~“~~"Get Relationships~~”~~" service (*getObjectRelationships*) may be used to return a set of relationship objects in which a given independent object is identified as the source or the target object, according to the binding semantics maintained by the repository (i.e., either a version-specific or a version-independent binding as described above).

2.1.6.1 Relationship Object-Type Definition

This section describes the definition of the Relationship Object-Type~~’~~'s attribute values and property definitions which must be present on Relationship instance objects. All attributes and property definitions are listed by their ID.

2.1.6.1.1 Attributes specific to Relationship Object-Types

The following Object ***attributes*** MUST only apply to Object-Type definitions whose baseId is the cmis:relationship Object-Type, in addition to the common attributes specified above:

allowedSourceTypes ID (multi-valued)

A list of object-type IDs, indicating that the source object of a relationship object of this type MUST only be one of the types listed.

If this attribute is ~~“~~"not set~~”~~", then the source object MAY be of any type.

allowedTargetTypes ID (multi-valued)

A list of object-type IDs, indicating that the target object of a relationship object of this type MUST only be one of the types listed.

If this attribute is ~~“~~"not set~~”~~", then the target object MAY be of any type.

2.1.6.1.2 Attribute Values

The Relationship Object-Type MUST have the following attribute values.

Notes:

- A value of <repository-specific> indicates that the value of the property MAY be set to any valid value for the attribute type.
- Unless explicitly stated otherwise, all values specified in the table MUST be followed for the Object-Type definition.

id

Value: cmis:relationship

localName

Value: <repository-specific>

localNamespace

Value: <repository-specific>

queryName

Value: cmis:relationship

displayName

Value: <repository-specific>

baseId

Value: cmis:relationship

parentId

Value: Not set

description

Value: <repository-specific>

creatable

Value: <repository-specific>

fileable

Value: FALSE

queryable

Value: <repository-specific>

includedInSupertypeQuery

Value: <repository-specific>

controllablePolicy

Value: <repository-specific>

allowedSourceTypes

Value: <repository-specific>

allowedTargetTypes

Value: <repository-specific>

controllableACL

Value: <repository-specific>

fulltextIndexed

Value: <repository-specific>

2.1.6.1.3 Property Definitions

The Relationship base Object-Type MUST have the following property definitions, and MAY include additional property definitions. Any attributes not specified by the Property Definitions are repository specific. For all property definitions on base types, the query name MUST be the same as the property ID. The repository MUST have the following property definitions on the Relationship Type:

cmis:name	Name of the object
Inherited:	False
Property Type:	String
Cardinality:	Single

cmis:objectId	Id of the object
Required:	False
Inherited:	False
Property Type:	ID

Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them

cmis:baseTypeId	Id of the base object-type for the object
Required:	False
Inherited:	False
Property Type:	ID
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them

cmis:objectTypeId	Id of the object~~’~~'s type
Required:	~~False~~True
Inherited:	False
Property Type:	ID
Cardinality:	Single
Updatability:	oncreate
Choices:	Not Applicable
Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them

cmis:createdBy	User who created the object.
Required:	False
Inherited:	False
Property Type:	String
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them

cmis:creationDate	DateTime when the object was created.
Required:	False
Inherited:	False

Property Type:	DateTime
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them

cmis:lastModifiedBy	User who last modified the object.
Required:	False
Inherited:	False
Property Type:	String
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them

cmis:lastModificationDate	DateTime when the object was last modified.
Required:	False
Inherited:	False
Property Type:	DateTime
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them

cmis:changeToken	Opaque token used for optimistic locking & concurrency checking. (see section 2.2.1.3 Change Tokens)
Required:	False
Inherited:	False
Property Type:	String
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them. If the repository does not support change tokens, this property SHOULD not be set.

cmis:sourceId	ID of the source object of the relationship.

Required:	True
Inherited:	False
Property Type:	ID
Cardinality:	Single
Choices:	Not Applicable
Open Choice:	Not Applicable

cmis:targetId	ID of the target object of the relationship.
Required:	True
Inherited:	False
Property Type:	ID
Cardinality:	Single
Choices:	Not Applicable
Open Choice:	Not Applicable

2.1.7 Policy Object

A policy object represents an administrative policy that can be enforced by a repository, such as a retention management policy. CMIS 1.0 does not specify what kinds of administrative policies that are specifically supported, nor attempts to model administrative policy of any particular kind. Only a base object-type is specified for policy objects. Each policy object holds the text of an administrative policy as a repository-specific string, which is opaque to CMIS and which may be used to support policies of various kinds. A repository may create subtypes of this base type to support different kinds of administrative policies more specifically. If a repository does not support policy objects, the policy base object-type SHOULD NOT be returned by a ~~“~~"Get Types~~”~~" service call. This is an extension point for repositories that want to expose other capabilities via CMIS that are not supported directly in CMIS 1.0.

Aside from allowing an application to create and maintain policy objects, CMIS allows an application to ~~“~~"apply~~”~~" a policy to an object, and to remove an applied policy from an object. An object to which a policy may be applied is called a *controllable* object. A policy MAY be applied to multiple controllable objects. Conversely, a repository MAY allow multiple policies applied to a controllable object. (A repository may, for example, impose constraints such as only one policy of each kind can be applied to an object.) Whether or not an object is controllable is specified by the object~~’~~'s type definition. Applying a policy to an object is to place the object under the control of that policy (while the object may also be under the control of other policies at the same time), and removing an applied policy from one of its controlled objects is to remove the corresponding control from that object. This control may change the state of the object, may impose certain constraints on service calls operating on this object, or may cause certain management actions to take place. The effect of this control, when this effect takes place, and how this control interacts with other controls, are repository-specific. Only directly/explicitly applied policies are covered by CMIS 1.0. Indirectly applying policy to an object, e.g. through inheritance, is outside the scope of CMIS 1.0.

A policy object does not have a content-stream and is not versionable. It may be fileable, queryable or controllable. Policy objects are handled using the basic CRUD services for objects. If a policy is updated, the change may alter the corresponding control on objects that the policy is currently applied to. If a controlled object is deleted, all the policies applied to that object, if there are any, are removed from that object. A policy object that is currently applied to one or more controllable objects CAN NOT be deleted. That is, there is an implicit referential constraint from a controlled object to its controlling policy object(s). Besides the basic CRUD services, the ~~“~~"Apply Policy~~”~~" (*applyPolicy*) and the ~~“~~"Remove Policy~~”~~" (*removePolicy*) services may be used to apply a policy object to a controllable object and respectively to remove an applied policy from one of its controlled objects. In addition, the ~~“~~"Get Applied Policies~~”~~" (*getAppliedPolicies*) service may be used to obtain the policy objects that are currently applied to a controllable object.

2.1.7.1 Policy Object-Type Definition

This section describes the definition of the Policy Object-Type’s attribute values and property definitions which must be present on Policy instance objects. All attributes and property definitions are listed by their ID.

2.1.7.1.1 Attribute Values

The Policy Object-Type MUST have the following attribute values.

Notes:

- A value of <repository-specific> indicates that the value of the property MAY be set to any valid value for the attribute type.
- Unless explicitly stated otherwise, all values specified in the table MUST be followed for the Object-Type definition.

id

Value: cmis:policy

localName

Value: <repository-specific>

localNamespace

Value: <repository-specific>

queryName

Value: cmis:policy

displayName

Value: <repository-specific>

baseId

Value: cmis:policy

parentId

Value: Not set

description

Value: <repository-specific>

creatable

Value: <repository-specific>

fileable

Value: <repository-specific>

queryable

Value: <repository-specific>

`includedInSupertypeQuery`

Value: <repository-specific>

`controllablePolicy`

Value: <repository-specific>

`controllableACL`

Value: <repository-specific>

`fulltextIndexed`

Value: <repository-specific>

2.1.7.1.2 Property Definitions

The Policy base Object-Type MUST have the following property definitions, and MAY include additional property definitions. Any attributes not specified by the Property Definitions are repository specific. For all property definitions on base types, the query name MUST be the same as the property ID. The repository MUST have the following property definitions on the Policy Type:

cmis:name	Name of the object
Inherited:	False
Property Type:	String
Cardinality:	Single

cmis:objectId	Id of the object
Required:	False
Inherited:	False
Property Type:	ID
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

cmis:baseTypeId	Id of the base object-type for the object
Required:	False
Inherited:	False
Property Type:	ID
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

cmis:objectTypeId	Id of the object~~'~~'s type
Required:	~~False~~True
Inherited:	False
Property Type:	ID
Cardinality:	Single
Updatability:	oncreate
Choices:	Not Applicable
Open Choice:	Not Applicable
cmis:createdBy	User who created the object.
Required:	False
Inherited:	False
Property Type:	String
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable
cmis:creationDate	DateTime when the object was created.
Required:	False
Inherited:	False
Property Type:	DateTime
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable
cmis:lastModifiedBy	User who last modified the object.
Required:	False
Inherited:	False
Property Type:	String
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable
cmis:lastModificationDate	DateTime when the object was last modified.
Required:	False
Inherited:	False
Property Type:	DateTime
Cardinality:	Single
Updatability:	Read Only

Choices:	Not Applicable
Open Choice:	Not Applicable

cmis:changeToken	Opaque token used for optimistic locking & concurrency checking. (see section 2.2.1.3 Change Tokens)
Required:	False
Inherited:	False
Property Type:	String
Cardinality:	Single
Updatability:	Read Only
Choices:	Not Applicable
Open Choice:	Not Applicable

Repository MUST return this property with non-empty values when an object is requested and the property filter does not exclude them. If the repository does not support change tokens, this property SHOULD not be set.

cmis:policyText	User-friendly description of the policy
Required:	True
Inherited:	False
Property Type:	String
Cardinality:	Single
Choices:	Not Applicable
Open Choice:	Not Applicable

2.1.8 Access Control

A repository can support either a base set of CMIS-defined permissions and/or its own set of repository specific permissions.

The getACL service allows the requestor to specify that the result be expressed using only the CMIS defined permissions. Without this restriction, the response may include, or be solely expressed in repository specific permissions. The applyACL service permits either CMIS permissions or repository permissions, or a combination of both, to be used.

2.1.8.1 ACL, ACE, Principal, and Permission

An ***ACL*** is a list of ***Access Control Entries*** (ACEs) and MAY hold zero or more ACEs. If an ACL has no ACEs, the behavior is the same as if the ACL is not set.

An ***ACE*** holds:

- one ***Principal:*** A principal represents a user management object, e.g. a user, group, or role. It holds one **String** with the ***principalid***.
- One or more **Strings** with the names of the ***permissions****.*
- a **Boolean** flag ***direct***, which indicates if TRUE the ACE is directly assigned to the object. If FALSE, that the ACE is somehow derived.

2.1.8.2 CMIS Permissions

There are three basic permissions predefined by CMIS:

- **cmis:read**: to be used to express ~~“~~"permission to read~~”~~". A Repository SHOULD express the permission for reading properties AND reading content with this permission.
- **cmis:write**: to be used to express ~~“~~"permission to write~~”~~". SHOULD be used to express permission to write properties and content of an object. MAY include other basic CMIS permissions.
- **cmis:all**: SHOULD be used to express all the permissions of a repository. SHOULD include all other basic CMIS permissions.

How these basic permissions can be mapped to the allowable actions is repository specific. However, the actual repository semantics for the basic permissions with regard to allowable actions can be discovered by the *mappings* parameter returned by *getRepositoryInfo* (see below).

Repositories MAY extend this set with repository-specific permissions.

2.1.8.3 ACL Capabilities

Whether a repository supports ACLs at all, may be discovered via *capabilityACL* returned by *getRepositoryInfo* (see section 2.1.1.1 Optional Capabilities). If *capabilityACL* is `none`, ACLs are not supported by the repository.

If *capabilityACL* is `discover` or `manage`, additional information about the repositories permission model and how changes to ACL are handled, can be discovered via the *getRepositoryInfo* service:

- **~~<Array>~~ Enum propagation:** specifies, how non-direct ACEs can be handled by the repository using the following values (see section 2.2.10.2 applyACL):
    - **objectonly** indicates, that the repository is able to apply ACEs to a document or folder, without changing the ACLs of other objects.
    - **propagate**: indicates that the ACEs is to be applied to the given object and all inheriting objects. *Propagate* incorporates the support for *objectonly*.
    - **repositorydetermined** indicates, that the repository has its own mechanism of computing how changing an ACL for an object influences the non-direct ACEs of other objects.
- **<Array> PermissionDefinition repositoryPermissions:** is a list with names and descriptions of the supported permissions.
- **<Array> PermissionMapping mappings:** contains a list with mappings for the basic CMIS permissions to allowed actions.

2.1.8.3.1 Supported Permissions

The list of permission definitions returned by *getRepositoryInfo* lists all the *per*missions a repository supports. This list also includes the CMIS permissions if supported by the repository.

A PermissionDefinition holds:

- **String permission:** the (technical) name of the permission (unique within the list of permission definitions).
- **(Optional) String description:** an optional description of the permission that should be used as the permission~~’~~'s name to be presented to the user.

2.1.8.3.2 AllowableActions & Permission Mapping

CMIS provides a mechanism called ~~“~~"AllowableActions~~”~~" which allows an application to discover the set of service operations that can currently be performed on a particular object, without having to actually invoke the service.

The set of allowable actions on an object at a point in time are affected not only by CMIS ACLs, but also by other factors such as:

1. Constraints inherent in the CMIS Domain Model based on the object's base type or current versioning state.
2. Policies or other control mechanisms that are opaque to CMIS.

CMIS defines several services that applications can use at run-time to discover the AllowableActions for an object.

If a Repository supports ACLs, then the repository MUST provide a mapping table that defines how the permissions supported by the repository interact with the CMIS allowable actions, i.e. which permissions are necessary for a principal to have on one or more objects in order to potentially perform each action, subject to the other constraints on allowable actions above.

This section defines both the allowable actions as well as how those actions are presented in the PermissionMapping table.

The Permission Mapping table contains a set of (*key*, *permissions)* pairs:

- **String Key:** Because several allowable actions may require permissions on more than one object – for example, moving a document from one folder to another may require permissions on the document and each of the folders – the mapping table is defined in terms of permission "keys", where each key combines the name of the allowable action as the object for which the principal needs the required permission.
    - For example – the canMoveObject.Source key indicates the permissions that the principal must have on the" "source folder" to move an object from that folder into another folder.
- <Array> String permissions: The names of one or more permissions that the principal MUST have. If more than one permission is specified, then the principal MUST be allowed to perform the operation if they have ANY of the listed permissions.

The list below defines all mapping keys, as well as a permissions mapping that repositories SHOULD use. Repositories MAY require additional permissions.

For convenience, the list below groups all mapping entries by the underlying Allowable Actions, and includes descriptive information. For each Allowable Action the following information is given:

Description:	The description and name of the service the AllowableAction enables.
Base Object:	The base object-types for which the allowable action MAY be TRUE.
Operand:	The object the permission applies to.
Key:	The permission mapping key.
Permissions:	The permission values.

Navigation Services:

canGetDescendants

Description:	Can get the descendants of the folder (`getDescendants`)
Base Object:	cmis:folder
Operand:	cmis:folder
Key:	canGetDescendants.Folder
Permission:	Read

~~**canGetFolderTree**~~

~~Description:~~	~~Can get the sub-folder tree of the folder (`getFolderTree`)~~
~~Base Object:~~	~~cmis:folder~~
~~Operand:~~	~~cmis:folder~~

~~Key:~~	~~canGetFolderTree.Folder~~
~~Permission:~~	~~Read~~

canGetChildren

Description:	Can get the children of the folder (`getChildren`)
Base Object:	cmis:folder
Operand:	cmis:folder
Key:	canGetChildren.Folder
Permission:	Read

canGetFolderParent

Description:	Can get the parent/ancestor folder(s) of the folder (`getFolderParent`)
Base Object:	cmis:folder
Operand:	cmis:folder
Key:	canGetFolderParent.~~Folder~~Object
Permission:	Read

canGetObjectParents

Description:	Can get the parent folders of the object. (`getObjectParents`)
Base Object:	cmis:document, cmis:folder, cmis:policy
Operand	Object
Key:	canGet~~Object~~Parents.Object
Permission:	Read

Object Services:

canCreateDocument

Description:	Can create a cmis:document Object in the folder (`createDocument`)
Base Object:	cmis:folder
Operand:	Folder
Key:	canCreateDocument.Folder
Permission:	Read

canCreateFolder

Description:	Can create a cmis:folder Object as a child of the specified folder (`createFolder`)
Base Object:	cmis:folder
Operand:	Folder
Key:	canCreateFolder.Folder
Permission:	Read

canCreateRelationship

Description:	Can create a Relationship in which this Object is a source (`createRelationship`)

Base Object: cmis:document, cmis:folder

Operand: Object

Key: canCreateRelationship.Source

Permission: Read

canCreateRelationship

Description: Can create a Relationship in which this Object is a target (`createRelationship`)

Base Object: cmis:document, cmis:folder

Operand: Object

Key: canCreateRelationship.Target

Permission: Read

canGetProperties

Description: Can read the properties of this object (`getProperties`)

Base Object: cmis:document, cmis:folder, cmis:relationship, cmis:policy

Operand: Object

Key: canGetProperties.Object

Permission: Read

~~**canGetRenditions**~~

~~Description: Can retrieve the renditions of this object (`getRenditions`)~~

~~Base Object: cmis:document, or cmis:folder~~

~~Operand: Object~~

~~Key: canGetRenditions.Object~~

~~Permission: Read~~

~~**canGetContentStream**~~

~~Description: Can get the content stream for the Document object (`getContentStream`)~~

~~Base Object: cmis:document~~

~~Operand: Object~~

~~Key: canGetContentStream.Object~~

~~Permission: Read~~

canUpdateProperties

Description: Can update the properties of this object (`updateProperties`)

Base Object: cmis:document, cmis:folder, cmis:relationship, cmis:policy

Operand: Object

Key: canUpdateProperties.Object

Permission: Write

canMoveObject

Description: Can move the object (`moveObject`)
Base Object: cmis:document, cmis:folder, cmis:policy
Operand: Object
Key: canMove~~Object~~.Object
Permission: Write

canMoveObject

Description: Can move an object into this folder (`moveObject`)
Base Object: cmis:folder
Operand: Folder
Key: canMove~~Object~~.Target
Permission: Read

canMoveObject

Description: Can move an object from this folder (`moveObject`)
Base Object: cmis:folder
Operand: Folder
Key: canMove~~Object~~.Source
Permission: Read

canDeleteObject

Description: Can delete this object (`deleteObject`)
Base Object: cmis:document, cmis:folder, cmis:relationship, cmis:policy
Operand: Object
Key: canDelete.Object
Permission: Write

~~**canDeleteObject**~~

~~Description: Can delete an object that is a child of this folder (`deleteObject`)~~
~~Base Object: cmis:folder~~
~~Operand: Folder~~
~~Key: canDelete.Folder~~
~~Permission: Read~~

canGetContentStream

Base Object: cmis:document
Action: Can get the content stream for the Document object (`getContentStream`)
Operand: Object
Key: canViewContent.Object
Permission: Read

canSetContentStream

Description: Can set the content stream for the Document object (`setContentStream`)

Base Object: cmis:document

Operand: Object

Key: canSetContent~~Stream~~.Document

Permission: Write

canDeleteContentStream

Base Object: cmis:document

Action: Can delete the content stream for the Document object (`deleteContentStream`)

Operand: Object

Key: canDeleteContent~~Stream~~.Document

Permission: Write

canDeleteTree

Base Object: cmis:folder

Action: Can delete the folder and all contained objects (`deleteTree`)

Operand: Object

Key: canDeleteTree.Folder

Permission: Write

Filing Services:

canAddObjectToFolder

Description: Can file the document in a folder (`addObjectToFolder`)

Base Object: cmis:document, cmis:policy

Operand: Object

Key: canAddToFolder.Object

Permission: Read

canAddObjectToFolder

Description: Can file a document in the specified folder (`addObjectToFolder`)

Base Object: cmis:document, cmis:policy

Operand: Object

Key: canAddToFolder.Folder

Permission: Read

canRemoveObjectFromFolder

Description: Can unfile the specified document from a folder (`removeObjectFromFolder`)

Base Object: cmis:document, cmis:policy

Operand: Object

Key: canRemove~~Object~~FromFolder.Object
Permission: Read

canRemoveObjectFromFolder

Description: Can unfile a document from the specified folder (`removeObjectFromFolder`)
Base Object: cmis:document, cmis:policy
Operand: Object
Key: canRemove~~Object~~FromFolder.Folder
Permission: Read

Versioning Services:

canCheckOut

Description: Can check out the Document object (`checkOut`)
Base Object: cmis:document
Operand: Object
Key: ~~canCheckOut~~canCheckout.Document
Permission: Write

canCancelCheckOut

Description: Can cancel the check out the Document object (`cancelCheckOut`)
Base Object: cmis:document
Operand: Object
Key: canCancelCheckout.Document
Permission: Write

canCheckIn

Description: Can check in the Document object (`checkIn`)
Base Object: cmis:document
Operand: Object
Key: canCheckin.Document
Permission: Write

canGetAllVersions

Description: Can get the version series for the Document object (`getAllVersions`)
Base Object: cmis:document
Operand: Object
Key: canGetAllVersions.VersionSeries~~Document~~
Permission: Read

Relationship Services:

canGetObjectRelationships

Description: Can get the relationship in which this object is a source/target (`getObjectRelationships`)

Base Object: cmis:document, cmis:folder, cmis:policy

Operand: Object

Key: canGetObjectRelationships.Object

Permission: Read

Policy Services:

canApplyPolicy

Description: Can apply a policy to the Object (`applyPolicy`)

Base Object: cmis:document, cmis:folder

Operand: Object

Key: canAddPolicy.Object

Permission: Read

canApplyPolicy

Description: Can apply the specified policy to an Object (`applyPolicy`)

Base Object: cmis:policy

Operand: Object

Key: canAddPolicy.Policy

Permission: Read

canRemovePolicy

Description: Can remove a policy from the specified Object (`removePolicy`)

Base Object: cmis:document, cmis:folder

Operand: Object

Key: canRemovePolicy.Object

Permission: Read

canRemovePolicy

Description: Can remove the specified policy from an Object (`removePolicy`)

Base Object: cmis:document, cmis:folder

Operand: cmis:policy

Key: canRemovePolicy.Policy

Permission: Read

canGetAppliedPolicies

Description: Can get the list of Policies applied to the Object (`getAppliedPolicies`)

Base Object: cmis:document, cmis:folder

Operand: Object

Key: canGetAppliedPolicies.Object

Permission: Read

ACL Services:

canGetACL

Description: Can get ACL for object (`getACL`)

Base Object: cmis:document, cmis:folder, cmis:relationship, cmis:policy

Operand: Object

Key: canGetACL.Object

Permission: Read

canApplyACL

Description: Can apply ACL to this object (`applyACL`)

Base Object: cmis:document, cmis:folder, cmis:relationship, cmis:policy

Operand: Object

Key: canApplyACL.Object

Permission: Write

2.1.9 Versioning

CMIS supports versioning of Document objects. Folder objects, relationship objects, and policy objects cannot be versioned.

Whether or not a Document object is versionable (i.e. whether or not operations performed on the object via the Versioning Services MUST be allowed) is specified by the ~~“~~"*versionable*~~”~~" attribute on its Object-type.

A **version** of a Document object is an explicit/~~”~~"deep~~”~~" copy of the object, preserving its state at a certain point in time. Each version of a Document object is itself a Document object, i.e. has its own *ObjectId*, property values, MAY be acted upon using all CMIS services that act upon Document objects, etc.

2.1.9.1 Version Series

A **version series** for a Document object is a transitively closed collection of all Document objects that have been created from an original Document in the Repository. Each version series has a unique, system-assigned, and immutable **version series ID.**

The version series has transitive closure -- that is, if object B is a version of object A, and object C is a version of object B, then object C is also a version of object A. The objects in a version series can be conceptually sequenced by their respective *CreationDate* properties.

Additionally, the repository MAY expose a textual **VersionLabel** that describes to a user the position of an individual object with respect to the version series. (For example, version 1.0).

Note: A Document object that is NOT versionable will always have a single object in its Version Series. A versionable Document object MAY have one or more objects in its Version Series.

2.1.9.2 Latest Version

The version that has the most recent *LastModificationDate* is called the ***Latest Version*** of the series, or equivalently, the latest version of any Document object in the series.

When the latest version of a version series is deleted, a previous version (if there is one) becomes the latest version.

2.1.9.2.1 Behavioral constraints on non-Latest Versions

Repositories NEED NOT allow the non-latest versions in a Version Series to be updated, queried, or searched.

2.1.9.3 Major Versions

A Document object in a Version Series MAY be designated as a ***Major Version.***

The CMIS specification does not define any semantic/behavioral differences between Major and non-Major versions in a Version Series. Repositories may enforce/apply additional constraints or semantics for Major versions, if the effect on CMIS services remains consistent with an allowable behavior of the CMIS model.

If the Version Series contains one or more Major versions, the one that has the most recent *LastModificationDate* is the ***Latest Major Version*** of the version series.

(Note that while a Version Series MUST always have a *Latest Version,* it NEED NOT have a *Latest Major Version.)*

When the latest major version is deleted, a previous major version (if there is one) becomes the latest major version.

2.1.9.4 Services that modify Version Series

2.1.9.4.1 Checkout

A new version of a versionable Document object is created when the *checkIn* service is invoked on the Private Working copy (PWC) of this object. A PWC is created by invoking *checkOut* on a versionable Document object. A repository MAY allow *any* Document object in a version series to be checked out, or MAY only allow the *Latest Version* to be checked out.

The effects of invoking the *checkout* service MUST be as follows:

- A new Document object, referred to herein as the ***Private Working Copy*** **(PWC),** is created.
  - The PWC NEED NOT be visible to users who have permissions to view other Document objects in the Version Series.
  - Until it is checked in (using the *checkIn* service), the PWC MUST NOT be considered the *LatestMajorVersion* in the Version Series.
  - The property values for the PWC SHOULD be identical to the properties of the Document object on which the *checkout* service was invoked. Certain properties such as cmis:objectId may be different. Properties such as cmis:creationDate most likely will be different. The content-stream of the PWC MAY be identical to the content-stream of the Document object on which the *checkout* service was invoked, or MAY be ~~“~~"not set~~”~~".

After a successful *checkout* operation is completed, and until such time when the PWC is deleted (via the *cancelCheckOut* service) or checked-in (via the *checkIn)* service, the effects on other Documents in the Version Series MUST be as follows:

- The repository MUST throw an exception if the *checkout* service is invoked on any Document in the Version Series. (I.e. there can only be one PWC for a version series at a time.)
- The value of the cmis:isVersionSeriesCheckedOut property MUST be TRUE.
- The value of the cmis:versionSeriesCheckedOutBy property MAY be set to a value indicating which user created the PWC. (The Repository MAY still show the ~~“~~"not set~~”~~" value for this property.)
- The value of the cmis:versionSeriesCheckedOutId property MAY be set to the ObjectId of the PWC. (The Repository MAY still show the ~~“~~"not set~~”~~" value for this property).
- The repository MAY prevent operations that modify or delete the other Documents in the Version Series.

2.1.9.4.2 Updates to the Private Working Copy

If the repository supports the optional ~~“~~"PWCUpdatable~~”~~" capability, then the repository MUST allow authorized users to modify the PWC Object using the Object services (e.g. *UpdateProperties).*

If the repository does NOT support the ~~“~~"PWCUpdatable~~”~~" capability, then the PWC object can only be modified as part of the *checkIn* service call.

2.1.9.4.3 Discarding Check out

An authorized user MAY discard the check-out using the *cancelCheckOut* service on any Document in the Version Series or by using the *deleteObject* service on the PWC Object. The effects of discarding a check-out MUST be as follows:

- The PWC Object MUST be deleted.
- For all other Documents in the Version Series:
  - The value of the cmis:isVersionSeriesCheckedOut property MUST be FALSE.
  - The value of the cmis:versionSeriesCheckedOutBy property MUST be ~~“~~"not set~~”~~".
  - The value of the cmis:versionSeriesCheckedOutId property MUST be ~~“~~"not set~~”~~".
  - The repository MUST allow authorized users to invoke the *checkout* service.

2.1.9.4.4 Checkin

An authorized user/application MAY ~~“~~"check in~~”~~" the Private Working Copy object via the *checkIn* service.

The *checkIn* service allows users/applications to provide update property values and a content-stream for the PWC object.

The effects of the checkIn service MUST be as follows for successful checkins:

- The PWC object MUST be updated as specified by the inputs to the *checkIn* service. (Note that for repositories that do NOT support the ~~“~~"PWCUpdatable~~”~~" property, this is the only way to update the PWC object.)
- The Document object resulting from the *checkIn* operation MUST be considered the *Latest Version* in the Version Series.
- If the inputs to the *checkIn* service specified that the PWC MUST be a ~~“~~"major version~~”~~", then the PWC MUST be considered the *Latest Major Version* in the Version Series.
- If the checkin returns a new cmis:objected, then the PWC object MUST disappear if the *checkIn* call was successful and the new checked in version will use the new specified id.
- For all Documents in the Version Series:
    - ~~0.~~○ The value of the cmis:isVersionSeriesCheckedOut property MUST be FALSE.
    - ~~1.~~○ The value of the cmis:versionSeriesCheckedOutBy property MUST be ~~“~~"not set~~”~~".
    - ~~2.~~○ The value of the cmis:versionSeriesCheckedOutId property MUST be ~~“~~"not set~~”~~".
    - ~~3.~~○ The repository MUST allow authorized users to invoke the *checkout* service.

Note: The Repository MAY change the ID of the PWC upon completion of the *checkin* service invocation.

Note: A repository MAY automatically create new versions of Document objects without an explicit invocation of the checkout/checkin services.

2.1.9.5 Versioning Properties on Document Objects

All Document objects will have the following read-only property values pertaining to versioning:

`cmis:isLatestVersion` `Boolean`

TRUE if the Document object is the *Latest Version* in its *Version Series.* FALSE otherwise.

`cmis:isMajorVersion` `Boolean`

TRUE if the Document object is a *Major Version* in its *Version Series.* FALSE otherwise.

`cmis:isLatestMajorVersion` `Boolean`

TRUE if the Document object is the *Latest Major Version* in its *Version Series.* FALSE otherwise.

`cmis:versionLabel` `String (optional)`

Optional textual description the position of an individual object with respect to the version series. (For example, version 1.0).

`cmis:versionSeriesId` `ID`

ID of the Version Series for this Object.

`cmis:isVersionSeriesCheckedOut` `Boolean`

TRUE if there currenly exists a Private Working Copy for this Version Series. FALSE otherwise `cmis:versionSeriesCheckedOutBy` String

If IsVersionSeriesCheckedOut is TRUE: then an identifier for the user who created the Private Working Copy. ~~“~~"Not set~~”~~" otherwise.

`cmis:versionSeriesCheckedOutId` ID

If IsVersionSeriesCheckedOut is TRUE: The Identifier for the Private Working Copy. ~~“~~"Not set~~”~~" otherwise.

`cmis:checkinComment` String

Textual comment associated with the given version.

Note: Changes made via the Versioning Services that affect the values of these properties MUST NOT constitute modifications to the Document objects in the Version Series (e.g. MUST NOT affect the cmis:lastModificationDate, etc.)

2.1.9.6 Document Creation and Initial Versioning State

A repository MAY create new Document objects in a ~~“~~"Private Working Copy~~”~~" state when they are created via the *createDocument or createDocumentFromSource* services. This state is logically equivalent to having a Version Series that contains exactly one object (the PWC) and 0 other documents.

The repository MAY also create new Document objects in a ~~“~~"Major Version~~”~~" state. This state is logically equivalent to having a Version Series that contains exactly one Major Version and 0 other documents.

The repository MAY also create new Document objects in a ~~“~~"Non-Major Version~~”~~" state. This state is logically equivalent to having a Version Series that contains exactly one Non-Major Version and 0 other documents.

If the repository does not support versioning the repository MUST ignore the value of the versioningState parameter.

2.1.9.7 Version Specific/Independent membership in Folders

Repositories MAY treat membership of a Document object in a folder collection as ~~“~~"version-specific~~”~~" or ~~“~~"version-independent~~”~~".

Repositories MUST indicate whether they support version-specific membership in a folder via the ~~“~~"VersionSpecificFiling~~”~~" optional capability flag.

If the repository is treating folder collection membership as ~~“~~"version-independent~~”~~", then:

- Moving or Filing a Document Object into a folder MUST result in ALL Documents in the Version Series being moved/filed into the folder.
- The Repository MAY return only the latest-version OR latest major-version Document object in a version series in the response to Navigation service requests (getChildren, getDescendants), and NEED NOT return other Document Objects filed in the folder that are in the Version Series.

If the repository is treating folder collection membership as ~~“~~"version-specific~~”~~", then moving or Filing a Document Object into a folder MUST NOT result in other Documents in the Version Series being moved/filed.

2.1.9.8 Version Specific/Independent membership in Relationships

A relationship object MAY have either a version-specific or version-independent binding to its source and/or target objects. This behavior MAY vary between repositories and between individual relationship types defined for a Repository.

If a relationship object has a version-independent binding to its source/target object, then:

- The getObjectRelationships service invoked on a Document Object MUST return the relationship if Relationship was source/target is set to ANY Document Object in the Version Series.

If a relationship object has a version-specific binding to its source/target object, then:

- The getObjectRelationships service invoked on a Document Object MUST return the relationship if Relationship was source/target is set to the ID of the Document Object on which the service was invoked.

2.1.9.9 Versioning visibility in Query Services

Repositories MAY include non-latest-versions of Document Objects in results to the Discovery Services *(query).*

Repositories MUST indicate whether they support querying for non-latest-versions via the ~~“~~"AllVersionsSearchable~~”~~" optional capability flag.

If ~~“~~"AllVersionsSearchable~~”~~" is TRUE then the Repository MUST include in the query results ANY Document Object in the Version Series that matches the query criteria. (subject to other query constraints such as security.)

Additionally, repositories MAY include Private Working Copy objects in results in results to the Discovery Services *(query).*

Repositories MUST indicate whether they support querying for Private Working Copy objects via the ~~“~~"PWCSearchable~~”~~" optional capability flag.

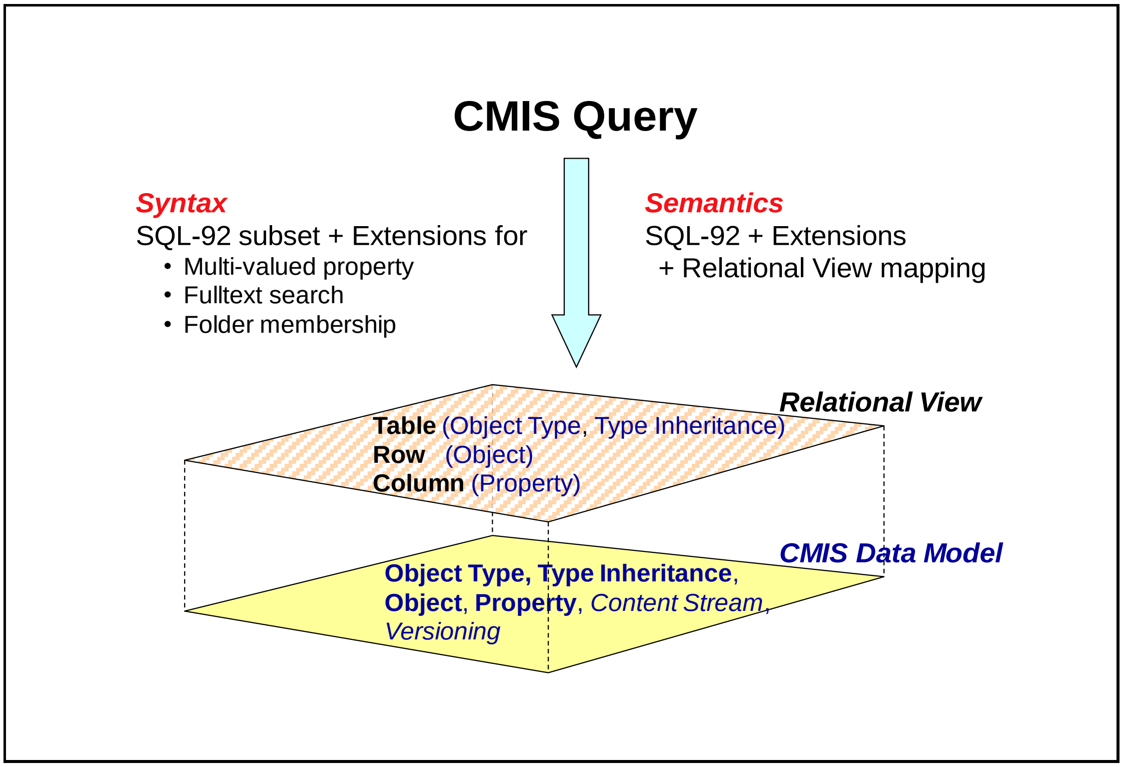
If ~~“~~"PWCSearchable~~”~~" is TRUE then the Repository MUST include in the query results ANY Private Working Copy Document Objects that matches the query criteria (subject to other query constraints such as security.)

If ~~“~~"PWCSearchable~~”~~" is FALSE then the Repository MUST NOT include in the query results ANY Private Working Copy Document Objects that match the query criteria (subject to other query constraints such as security.)

2.1.10 Query

CMIS provides a type-based query service for discovering objects that match specified criteria, by defining a read-only projection of the CMIS data model into a *Relational View.*

Through this relational view, queries may be performed via a simplified SQL SELECT statement. This query language is based on a subset of the SQL-92 grammar (ISO/IEC 9075: 1992 – Database Language SQL), with a few extensions to enhance its filtering capability for the CMIS data model, such as existential quantification for multi-valued property, full-text search, and folder membership. Other statements of the SQL language are not adopted by CMIS. The semantics of this query language is defined by the SQL-92 standard, plus the extensions, in conjunction with the model mapping defined by CMIS~~’~~'s relational view.



2.1.10.1 Relational View Projection of the CMIS Data Model

The relational view of a CMIS repository consists of a collection of virtual tables that are defined on top of the CMIS data model. This relational view is used for query purposes only.

In this relational view a **Virtual Table** is implicitly defined for each *queryable* Object-Type defined in the repository. (Non-queryable Object-Types are NOT exposed through this Relational View.)

In each **Virtual Table**, a **Virtual Column** is implicitly defined for each property defined in the Object-Type Definition AND for all properties defined on ANY ancestor-type of the Object-Type but NOT defined in the Object-Type definition. Virtual Columns for properties defined on ancestor-types of the Object-type but NOT defined in the Object-Type definition MUST contain the SQL NULL value. Virtual Columns for properties whose value is ~~“~~"not set~~”~~" MUST contain the SQL NULL value.

An object-type~~’~~'s *queryName* attribute is used as the table name for the corresponding virtual table, and a property~~’~~'s *queryName* attribute is used as the column name for the corresponding table column. Please see the restrictions on queryName in the appropriate data model section.

The Virtual Column for a multi-valued property MUST contain a single list value that includes all values of the property.

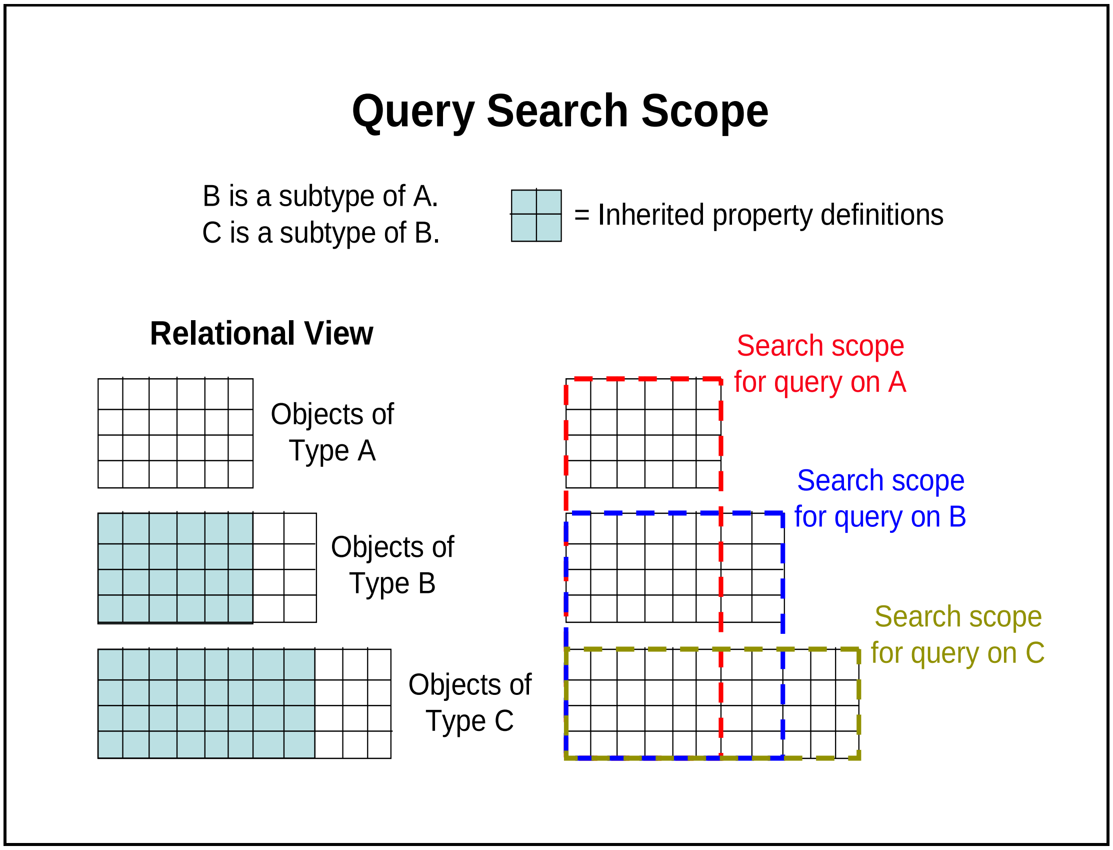
2.1.10.1.1 Object-Type Hierarchy in the Relational View Projection

The Relational View projection of the CMIS Data Model ensures that the Virtual Table for a particular Object-type is a complete super-set of the Virtual Table for any and all of its ancestor types.

Additionally, an Object-Type definition~~’~~'s ~~“~~"*includedInSupertypeQuery*~~”~~" specifies whether objects of that Object-Type MUST be included in the Virtual Table for any of its ancestor types. If the ~~“~~"*includedInSupertypeQuery*~~”~~" attribute of the Object-Type is FALSE, then objects of that Object-Type MUST NOT be included in the Virtual Table for any of its ancestor types.

Thus the Virtual Table for an Object-type includes a row not only for each Object of that type, but all Objects of any of that Object-types~~’~~' Descendant Types for which the ~~“~~"*includedInSupertypeQuery*~~”~~" attribute is TRUE.

But since the Virtual Table will include only columns for properties defined in the Object-Type underlying the Virtual Table, a row that is a query result representing an Object of a Descendant Type can only include those columns for properties defined on the Object-Type underlying the Virtual Table.



2.1.10.1.2 Content Streams

Content-streams are NOT exposed through this relational view.

2.1.10.1.3 Result Set

When a query is submitted, a set of pseudo CMIS objects will be returned. These pseudo objects are comprised of the properties specified in the select clause of the query statement.

For each property in each object in the result set, the Repository MUST include the property definition ID as well as either the query name (if no alias is used) or the alias in place of the query name (if an alias is used).

If the select clause of the query statement contains properties from a single type reference then the repository MAY represent these pseudo-objects with additional object information.

2.1.10.2 Query Language Definition

This query languages is based on a subset of the SQL-92 grammar. CMIS-specific language extensions to SQL-92 are called out explicitly.

The basic structure of a CMIS query is a SQL statement that MUST include the following clauses:

- **SELECT [virtual columns]:** This clause identifies the set of virtual columns that will be included in the query results for each row.
- **FROM [Virtual Table Names]:** This clause identifies which Virtual Table(s) the query will run against.

Additionally, a CMIS query MAY include the following clauses:

- **WHERE [conditions]:** This clause identifies the constraints that rows MUST satisfy to be considered a result for the query.
- **ORDER BY [sort specification]:** This clause identifies the order in which the result rows MUST be sorted in the result row set.

2.1.10.2.1 BNF Grammar

This BNF grammar is a ~~“~~"subset~~”~~" of the SQL-92 grammar (ISO/IEC 9075: 1992 – Database Language SQL), except for some production alternatives. Specifically, except for these extensions, the following production rules are derived from the SQL-92 grammar. The non-terminals used in this grammar are also borrowed from the SQL-92 grammar without altering their semantics. Accordingly, the non-terminal <column name> is used for single-valued properties only so that the semantics of SQL can be preserved and borrowed. This approach not only facilitates comparison of the two query languages, and simplifies the translation of a CMIS query to a SQL query for a RDBMS-based implementation, but also allows future expansion of this query language to cover a larger subset of SQL with minimum conflict. The CMIS extensions are introduced primarily to support multi-valued properties and full-text search, and to test folder membership. Multi-valued properties are handled separately from single-valued properties, using separate non-terminals and separate production rules to prevent the extensions from corrupting SQL-92 semantics.

<CMIS 1.0 query statement> ::= <simple table> [<order by clause>]

<simple table> ::= SELECT <select list> <from clause> [<where clause>]

<select list> ::= ~~“~~"*~~”~~"

| <select sublist> [{ ~~“~~",~~”~~" <select sublist> }…]

<select sublist> ::= <value expression> [[AS] <column name>]

| <qualifier> ~~“~~".*~~”~~"

| <multi-valued-column reference>

<value expression> ::= <column reference> | <numeric value function>

<column reference> ::= [<qualifier> ~~“~~".~~”~~"] <column name>

<multi-valued-column reference> ::= [<qualifier> ~~“~~".~~”~~"] <multi-valued-column name>

<numeric value function> ::= SCORE()

<qualifier> ::= <table name> | <correlation name>

<from clause> ::= FROM <table reference>

<table reference> ::= <table name> [[AS] <correlation name>]

| <joined table>

<joined table> ::= ~~“~~"(~~“~~" <joined table> ~~“~~")~~”~~"

| <table reference> [<join type>] JOIN <table reference> <join specification>

<join type> ::= INNER | LEFT [OUTER]

<join specification> ::= ON <column reference> ~~"~~"=~~"~~" <column reference>

<where clause> ::= WHERE <search condition>

<search condition> ::= <boolean term> | <search condition> OR <boolean term>

<boolean term> ::= <boolean factor> | <boolean term> AND <boolean factor>

<boolean factor> ::= [NOT] <boolean test>

<boolean test> ::= <predicate> | ~~“~~"(~~“~~" <search condition> ~~“~~")~~”~~"

<predicate> ::= <comparison predicate> | <in predicate> | <like predicate> | <null predicate>

| <quantified comparison predicate> | <quantified in predicate>

| <text search predicate> | <folder predicate>

<comparison predicate> ::= <value expression> <comp op> <literal>

<comp op> ::= ~~“~~"=~~”~~" | ~~“~~"<>~~”~~" | ~~“~~"<~~”~~" | ~~“~~">~~”~~" | ~~“~~"<=~~”~~" | ~~“~~">=~~”~~"

<literal> ::= <signed numeric literal> | <character string literal> | <datetime literal> | <boolean literal>

<in predicate> ::= <column reference> [NOT] IN ~~“~~"(~~“~~" <in value list> ~~“~~")~~”~~"

<in value list> ::= <literal> [{ ~~“~~",~~”~~" <literal> }…]

<like predicate> ::= <column reference> [NOT] LIKE <character string literal>

<null predicate> ::= { <column reference> | <multi-valued-column reference> } IS [NOT] NULL

<quantified comparison predicate> ::= <literal> ~~“~~"=~~”~~" ANY <multi-valued-column reference>

<quantified in predicate> ::= ANY <multi-valued-column reference> [NOT] IN ~~“~~"(~~“~~" <in value list> ~~“~~")~~”~~"

<text search predicate> ::= CONTAINS ~~"~~"(~~"~~"

[<qualifier> ~~"~~",~~"~~"] <quote> <text search expression> <quote> ~~"~~")~~"~~"

<folder predicate> ::= { IN_FOLDER | IN_TREE } ~~“~~"(~~“~~" [<qualifier> ~~“~~",~~”~~"] <folder id> ~~“~~")~~”~~"

<order by clause> ::= ORDER BY <sort specification> [{ ~~“~~",~~”~~" <sort specification> }…]

<sort specification> ::= <column reference> [ASC | DESC]

<correlation name> ::= <identifier>

<table name> ::= <identifier> !! This MUST be the name of an object-type.

<column name> ::= <identifier> !! This MUST be the name of a single-valued property,
or an alias for a scalar output value.

<multi-valued-column name> ::= <identifier> !! This MUST be the name of a multi-valued property.

<folder id> ::= <character string literal> !! This MUST be the object identity of a folder object.

<identifier> ::= !! As defined by queryName attribute.

<signed numeric literal> ::= !! As defined by SQL-92 grammar.

<character string literal> ::= !! As defined by SQL-92 grammar. (i.e. enclosed in single-quotes)

!! This is an independent sub-grammar for full-text search criteria. It is isolatable from the query statement grammar. (See 2.1.10.3 Escaping)

<text search expression> ::= <conjunct> [{<space> OR <space> <conjunct>} …]

<conjunct> ::= <term> [{<space> <term>} …]

<term> ::= [~~'~~"-~~'~~"] <simple term>

<simple term> ::= <word> | <phrase>

<word> ::= <non space char> [{<non space char>} …]

<phrase> ::= <quote> <word> [{<space> <word>} …] <quote>

<space> ::= <space char> [{<space char>} …]

<non space char> ::= <char> - <space char>

<space char> ::= ~~'~~" ~~'~~"

<char> ::= !! Any character

<datetime literal> ::= TIMESTAMP <quote> <datetime string> <quote>

<datetime string> ::= YYYY-MM-DDThh:mm:ss.sss[Z | +hh:mm | -hh:mm]

<boolean literal> ::= TRUE | FALSE | true | false

<quote> ::= ~~“~~"'~~”~~"!! Single-quote only, consistent with SQL-92 string literal

2.1.10.2.2 SELECT Clause

The SELECT clause MUST contain exactly one of the following:

- A comma separated list of one or more column names.
  - If an explicit column list is provided: A repository MUST include in its result row set all of the columns specified in the SELECT clause.
- * : If this token is specified, then the repository MUST return columns for ALL single-valued properties defined in the Object-Types whose Virtual Tables are listed in the FROM clause, and SHOULD also return all multi-valued properties.

All column names MUST be valid ~~“~~"queryName~~”~~" values for properties that are defined as ~~“~~"queryable~~”~~" in the Object-Type(s) whose Virtual Tables are listed in the FROM clause.

2.1.10.2.3 FROM Clause

The FROM clause identifies which Virtual Table(s) the query will be run against, as described in the previous section.

The FROM clause MUST contain only the queryNames of Object-Types whose *queryable* attribute value is TRUE.

2.1.10.2.3.1 Join Support

CMIS repositories MAY support the use of SQL JOIN queries, and MUST indicate their support level using the Optional Capability attribute ~~“~~"capabilityJoin~~”~~".

- If the Repository~~’~~'s value for the capabilityJoin attribute is **none**, then no JOIN clauses can be used in queries.
- If the Repository~~’~~'s value for the capabilityJoin attribute is **inneronly**, then only inner JOIN clauses can be used in queries.
- If the Repository~~’~~'s value for the capabilityJoin attribute is **innerandouter**, then inner and/or outer JOIN clauses can be used in queries.

Only explicit joins using the ~~“~~"JOIN~~”~~" keyword is supported. Queries MUST NOT include implicit joins as part of the WHERE clause of a CMIS query.

CMIS queries MUST only support join operations using the ~~“~~"equality~~”~~" predicate on single-valued properties.

2.1.10.2.4 WHERE Clause

This clause identifies the constraints that rows MUST satisfy to be considered a result for the query.

All column names MUST be valid ~~“~~"queryName~~”~~" or their aliased values for properties that are defined as ~~“~~"queryable~~”~~" in the Object-Type(s) whose Virtual Tables are listed in the FROM clause.

Properties are defined to not support a ~~“~~"null~~”~~" value, therefore the <null predicate> MUST be interpreted as testing the not set or set state of the specified property.

2.1.10.2.4.1 Comparisons permitted in the WHERE clause.

SQL~~’~~'s simple comparison predicate, IN predicate, and LIKE predicate are supported, for single-valued properties only (so that SQL~~’~~'s semantics is preserved). Boolean conjunction (AND), disjunction (OR), and negation (NOT) of predicates are also supported.

Repositories SHOULD support the comparisons for the property types as described in the list below. Repositories MAY support additional comparisons and operators. Any additional operators not specified are repository-specific:

<Property Type>
Supported Operators: <List of Operators supported on Type>
Supported Literal: <Supported type of Literal in comparison>

String (Single)
Supported Operators: =, <>, [NOT] LIKE
Supported Literal: String

String (IN)
Supported Operators: [NOT] IN
Supported Literal: List of Strings

Decimal
Supported Operators: =, <>, <, <=, >, >=
Supported Literal: Decimal

Decimal (IN)

Supported Operators: [NOT] IN

Supported Literal: List of Decimal

Integer

Supported Operators: =, <>, <, <=, >, >=

Supported Literal: Integer

Integer (IN)

Supported Operators: [NOT] IN

Supported Literal: List of Integer

Boolean

Supported Operators: =

Supported Literal: <boolean literal>

DateTime

Supported Operators: =, <>, <*, <=*, >*, >=*

Supported Literal: <datetime literal>

* - comparison is based on chronological before or after date.

DateTime (IN)

Supported Operators: [NOT] IN

Supported Literal: List of <datetime literal>~~’~~'s

ID

Supported Operators: =, <>

Supported Literal: String

ID (IN)

Supported Operators: [NOT] IN

Supported Literal: List of strings

URI

Supported Operators: =, <>

Supported Literal: String

URI (IN)

Supported Operators: [NOT] IN

Supported Literal: List of strings

URI

Supported Operators: [NOT] LIKE

Supported Literal: String

Operations on the SCORE() output MUST be treated the same as decimal operations.

When using properties in a join statement, comparison MUST be allowed on properties of the same types as defined by the table above. Repositories MAY extend this behavior.

The ANY operation argument MUST be one of the properties found in the table above which supports equality operations

2.1.10.2.4.2 Multi-valued property support (SQL-92 Extension)

The CMIS query language includes several new non-terminals to expose semantics for querying multi-valued properties, in a way that does not alter the semantics of existing SQL-92 production rules.

2.1.10.2.4.2.1 Multi-valued column references

BNF grammar structure: <Multi-valued-column reference>, <multi-valued-column name>

- These are non-terminals defined for multi-valued properties whereas SQL-92~~’~~'s <column reference> and <column name> are retained for single-valued properties only. This is to preserve the single-value semantics of a regular ~~“~~"column~~”~~" in the SQL-92 grammar.

2.1.10.2.4.2.2 <Quantified comparison predicate>

The SQL-92 production rule for <quantified comparison predicate> is extended to accept a multi-valued property in place of a <table subquery>.   This operation is restricted to equality tests only.

<Table subquery> is not supported in CMIS-SQL.

The SQL-92 <quantifier> is restricted to ANY only.

The SQL-92 <row value constructor> is restricted to a literal only.

Example:

```
SELECT          Y.CLAIM_NUM, X.PROPERTY_ADDRESS, Y.DAMAGE_ESTIMATES
FROM  (POLICY AS X JOIN CLAIMS AS Y ON ~~(~~X.POLICY_NUM = Y.POLICY_NUM )
WHERE           ( 100000 = ANY Y.DAMAGE_ESTIMATES )
```

(Note: DAMAGE_ESTIMATES is a multi-valued Integer property.)

2.1.10.2.4.2.3 IN/ANY Predicate

BNF grammar structure: <Quantified in predicate>

CMIS-SQL exposes a new IN predicate defined for a multi-valued property. It is modeled after the SQL-92 IN predicate, but since the entire predicate is different semantically, it has its own production rule in the BNF grammar below.

The quantifier is restricted to ANY. The predicate MUST be evaluated to TRUE if at least one of the property~~’~~'s values is (or, is not, if NOT is specified) among the given list of literal values. Otherwise the predicate is evaluated to FALSE.

The ANY operation argument MUST be one of the properties found in the comparison list above which supports IN operations.

Example:

```
SELECT          *
FROM  CAR_REVIEW
WHERE          (MAKE = ~~‘~~'buick~~’~~' ) OR
               ( ANY FEATURES IN (~~‘~~'NAVIGATION SYSTEM~~’~~', ~~‘~~'SATELLITE RADIO~~’~~', ~~‘~~'MP3~~’~~')
) (Note: FEATURES is a multi-valued String property.)
```

2.1.10.2.4.3 CONTAINS() predicate function (CMIS-SQL Extension)

BNF grammar structure:: CONTAINS ([<qualifier> ,] ~~‘~~' <text search expression> ~~’~~')

Usage: This is a predicate function that encapsulates the full-text search capability that MAY be provided by a Repository (See previous section.)

Inputs:

<Qualifier>

The value of this optional parameter MUST be the name of one of the Virtual Tables listed in the FROM clause for the query.

- ○ If specified, then the predicate SHOULD only be applied to objects in the specified Virtual Table, but a repository MAY ignore the value of the parameter.
- ○ If not specified, applies to the single virtual table. If the query is a join, a server SHOULD throw an exception if the qualifier is not specified.

<Text Search Expression>

The <text search expression> parameter MUST be a character string , specifying the full-text search criteria.

The Text Search Expression may be a set of terms or phrases with an optional ~~‘~~'-~~‘~~' to signal negation. A phrase is defined as a word or group of words. A group of words must be surrounded by quotes to be considered a single phrase.

Terms separated by whitespace are AND~~’~~'ed together.

Terms separated by ~~“~~"OR~~”~~" are OR~~’~~'ed together

Implicit ~~“~~"AND~~”~~" has higher precedence than ~~“~~"OR~~”~~"

Within a word or phrase, each (single-)quote must also be escaped by a preceding backslash ~~“~~"\~~”~~"

Return value:

The predicate returns a Boolean value.

The predicate MUST return TRUE if the object is considered by the repository as ~~“~~"relevant~~”~~" with respect to the given <text search expression> parameter.

The predicate MUST return FALSE if the object is considered by the repository as not ~~“~~"relevant~~”~~" with respect to the given <text search expression> parameter.

Constraints:

At most one CONTAINS() function MUST be included in a single query statement. The repository MUST throw an exception if more than one CONTAINS() function is found.

The return value of the CONTAINS() function MAY only be included conjunctively (ANDed) with the aggregate of all other predicates, if there is any, in the WHERE clause.

2.1.10.2.4.4 SCORE() predicate function

BNF grammar structure: SCORE ()

Usage: This is a predicate function that encapsulates the full-text search capability that MAY be provided by a Repository (See previous section.)

Inputs: No inputs MUST be provided for this predicate function.

Return value:

The SCORE() predicate function returns a decimal value in the interval [0,1] .

A repository MUST return the value 0 if the object is considered by the repository as having absolutely no relevance with respect to the CONTAINS() function specified in the query.

A repository MUST return the value 1 if the object is considered by the repository as having absolutely complete relevance with respect to the CONTAINS() function specified in the query.

Constraints:

The SCORE() function MUST only be used in queries that also include a CONTAINS() predicate function

The SCORE() function MUST only be used in the SELECT clause of a query. It MUST NOT be used in the WHERE clause or in the ORDER BY clauses.

An alias column name defined for the SCORE() function call in the SELECT clause (i.e., ~~“~~"SELECT SCORE() AS column_name …~~”~~") may be used in the ORDER BY clause.

If SCORE() is included in the SELECT clause and an alias column name is not provided, then a query name of SEARCH_SCORE is used for the query output, and the property definition ID is repository-specific.

2.1.10.2.4.5 IN_FOLDER() predicate function

BNF grammar structure: IN_FOLDER([<qualifier>,] <folder id>)

Usage: This is a predicate function that tests whether or not a candidate object is a child-object of the folder object identified by the given <folder id>.

Inputs:

<qualifier>
The value of this optional parameter MUST be the name of one of the Virtual Tables listed in the FROM clause for the query.

- If specified, then the predicate SHOULD only be applied to objects in the specified Virtual Table, but a repository MAY ignore the value of the parameter.
- If not specified, applies to the single virtual table. If the query is a join, a server SHOULD throw an exception if the qualifier is not specified.

<folder id>

The value of this parameter MUST be the ID of a folder object in the repository.

Return value:

The predicate function MUST return TRUE if the object is a child-object of the folder specified by <folder id>.
The predicate function MUST return FALSE if the object is a NOT a child-object of the folder specified by <folder id>.

2.1.10.2.4.6 IN_TREE() predicate function

BNF grammar structure: IN_TREE([<qualifier>,] <folder id>)

Usage: This is a predicate function that tests whether or not a candidate object is a descendant-object of the folder object identified by the given <folder id>.

Inputs:

<qualifier>

The value of this optional parameter MUST be the name of one of the Virtual Tables listed in the FROM clause for the query.

- ~~•~~○ If specified, then the predicate SHOULD only be applied to objects in the specified Virtual Table, but a repository MAY ignore the value of the parameter.
- ~~•~~○ If not specified, applies to the single virtual table. If the query is a join, a server SHOULD throw an exception if the qualifier is not specified.

<folder id>

The value of this parameter MUST be the ID of a folder object in the repository.

Return value:

The predicate function MUST return TRUE if the object is a descendant-object of the folder specified by <folder id>.
The predicate function MUST return FALSE if the object is a NOT a descendant -object of the folder specified by <folder id>.

2.1.10.2.5 ORDER BY Clause

This clause MUST contain a comma separated list of one or more column names.

All column names referenced in this clause MUST be valid ~~“~~"queryName~~”~~" or their aliased values for properties defined as *orderable* in the Object-type(s) whose Virtual Tables are listed in the FROM clause.

Only columns in the SELECT clause MAY be in the ORDER BY clause.

Collation rules for the ORDER BY clause are repository specific.

2.1.10.3 Escaping

Character escaping for character strings differs from SQL-92's escaping. A repository MUST support the escaping of certain literal characters in a character string, or in a text expression, using a backslash character (\) in the following manner. For a <character string literal>, which MUST BE a string enclosed in single-quotes according to the SQL-92 grammar, any occurrence of the single-quote character (') and the escape character (\) in the string MUST BE escaped. This applies to <folder id>, which is a <character string literal>. Furthermore, when a <character string literal> is used in a LIKE predicate, any occurrence of the percent character (%) and the underscore character (_) in the string as a literal MUST BE escaped also. Therefore, within a quoted string in a query:

- The double character \' represents a literal single-quote (') character.
- The double character \ \ represents a literal backslash (\) character.
- Within a LIKE string, the double characters \% and _ represent a literal percent (%) character and a literal underscore (_) character respectively.
- All other instances of a backslash (\) character are errors.

Using double single-quotes ('') as a SQL-92 way to escape a literal single-quote (') character SHOULD BE supported as an allowable alternative to the double character \'.

For a <text search expression>, a second-level character escaping is required so that the <text search expression> sub-grammar is *isolatable* from the query statement-level grammar. When a text search expression is composed for a query according to the <text search expression> sub-grammar, any occurrence of the following three characters in the expression as a literal character MUST BE escaped: hyphen (-), single-quote ('), and the escape character (\). Then, before this expression is enclosed in single-quotes and inserted into a CONTAINS() predicate, the query statement-level escaping rules described in the above MUST BE applied. This two-level character escaping allows a query statement parser, using statement-level escaping rules, to correctly extract a <text search expression> as a character string literal independent of the <text search expression> sub-grammar. This extracted <text search expression> can then be correctly interpreted by a full-text search parser independent of the query-statement grammar, using second-level escaping rules. Since the <text search expression> sub-grammar is isolated from the SQL-92 grammar, double single-quotes is not a valid way to escape a literal single-quote character for second-level character escaping.

An <identifier> in a query statement MUST conform to the SQL-92 identifier syntax, and MUST NOT require character escaping.

Example 1:
A query statement that contains a full-text search for the literal string "John'sPresentation-Version2" may be composed as:

```
        SELECT … FROM … WHERE … CONTAINS('John\\\'sPresentation\\-Version2') …
```

A query parser extracts from this statement the text search expression "John\'sPresentation\-Version2" as a character string literal, and passes it to a text-search parser, which interprets it as a single-word full-text search criteria: *John'sPresentation-Version2*.

Example 2:
A query statement that contains a full-text search for the phrase "Content Management" may be composed as:

```
        SELECT … FROM … WHERE … CONTAINS('\'Content Management\'') …
```

~~**2.1.10.3**~~A query parser extracts from this statement the text search expression "'Content Management'" as a character string literal, and passes it to a text-search parser, which interprets it as a full-text search criteria consisting of a single phrase: *Content Management*. There is no second-level escaping.

~~Repositories MUST support the escaping of characters using a backslash (\) in the query statement. The backslash character (\) will be used to escape characters within quoted strings in the query as follows:~~

~~1.\' will represent a single-quote(') character~~

~~2.\ \ will represent a backslash (\) character~~

~~3.Within a LIKE string, \% and _ will represent the literal characters % and _, respectively.~~

~~4.All other instances of a \ are errors.~~

~~4.~~

~~4.~~

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~~4.~~

2.1.11 Change Log

CMIS provides a ~~“~~"change log~~”~~" mechanism to allow applications to easily discover the set of changes that have occurred to objects stored in the repository since a previous point in time. This change log can then be used by applications such as search services that maintain an external index of the repository to efficiently determine how to synchronize their index to the current state of the repository (rather than having to query for all objects currently in the repository).

Entries recorded in the change log are referred to below as ~~“~~"change events~~”~~".

Note that change events in the change log MUST be returned in ascending order from the time when the change event occurred.

2.1.11.1 Completeness of the Change Log

The Change Log mechanism exposed by a repository MAY be able to return an entry for every change ever made to content in the repository, or may only be able to return an entry for all changes made since a particular point in time. This ~~“~~"completeness~~”~~" level of the change log is indicated via the optional `changesIncomplete` value found on the getRepositoryInfo service response

However, repositories MUST ensure that if an application requests the entire contents of the repository~~’~~'s change log, that the contents of the change log includes ALL changes made to any object in the repository *after* the first change listed in the change log. (I.e. repositories MAY truncate events from the change log on a ~~“~~"first-in first-out~~”~~" basis, but not in any other order.)

A Repository MAY record events such as filing/unfiling/moving of Documents as change events on the Documents, their parent Folder(s), or both the Documents and the parent Folders.

2.1.11.2 Change Log Token

The primary index into the change log of a repository is the ~~“~~"change log token~~”~~". The change log token is an opaque string that uniquely identifies a particular change in the change log.

2.1.11.2.1 ~~“~~"Latest Change Token~~”~~" repository information

Repositories that support the changeLogToken event MUST expose the latest change log token (i.e. the change log token corresponding to the most recent change to any object in the repository) as a property returned by the getRepositoryInfo service.

This will enable applications to begin ~~“~~"subscribing~~”~~" to the change log for a repository by discovering what change log token they should use on a going-forward basis to discover change events to the repository.

2.1.11.3 Change Event

A change event represents a single action that occurred to an object in the repository that affected the persisted state of the object.

A Repository that supports the change log capability MUST expose at least the following information for each change object:

- **ID ObjectId:** The ObjectId of the object to which the change occurred
- **Enum ChangeType:** An enumeration that indicates the type of the change. Valid values are:
  - `created`: The object was created.
  - `updated`: The object was updated.

  - `deleted`: The object was deleted
  - `security`: The access control or security policy for the object were changed.
- **<Properties> properties:** Additionally, for events of changeType ~~“~~"updated~~”~~", the repository MAY optionally include the new values of properties on the object (if any).

Repositories MUST indicate whether they include properties for ~~“~~"updated~~”~~" change events via the optional `enumCapabilityChanges` capability.

2.2 Services

The Services section of the CMIS specification defines a set of services that are described in a protocol/binding-agnostic fashion.

Every protocol binding of the CMIS specification MUST implement all of the methods described in this section or explain why the service is not implemented.

However, the details of how each service & method is implemented will be described in those protocol binding specifications.

2.2.1 Common Service Elements

The following elements are common across many of the CMIS services.

2.2.1.1 Paging

All of the methods that allow for the retrieval of a collection of CMIS objects support paging of their result sets except where explicitly stated otherwise. The following pattern is used:

Input Parameters:

- **(optional) Integer maxItems:** This is the maximum number of items to return in a response. The repository MUST NOT exceed this maximum. Default is repository-specific.
- **(optional) Integer skipCount:** This is the number of potential results that the repository MUST skip/page over before returning any results. Defaults to 0.

Output Parameters:

- **Boolean** `hasMoreItems`**:** TRUE if the Repository contains additional items after those contained in the response. FALSE otherwise. If TRUE, a request with a larger skipCount or larger maxItems is expected to return additional results (unless the contents of the repository has changed).
- **`Integer numItems`:** If the repository knows the total number of items in a result set, the repository SHOULD include the number here. If the repository does not know the number of items in a result set, this parameter SHOULD not be set. The value in the parameter MAY NOT be accurate the next time the client retrieves the result set or the next page in the result set.

If the caller of a method does not specify a value for maxItems, then the Repository MAY select an appropriate number of items to return, and MUST use the hasMoreItems output parameter to indicate if any additional results were not returned.

Repositories MAY return a smaller number of items than the specified value for maxItems.

Each binding will express the above in context and may have different mechanisms for communicating hasMoreItems and numItems.

2.2.1.2 Retrieving additional information on objects in CMIS service calls

Several CMIS services that return object information have the ability to return dependent object information as part of their response, such as the Allowable Actions for an object, rendition information, etc.

The CMIS service methods that support returning a result set of objects will include the ability to return the following object information:

- Properties (retrieves a subset instead of additional information)
- Relationships
- Renditions
- ACLs
- AllowableActions

This section describes the input parameter & output pattern for those services. All input parameters are optional.

2.2.1.2.1 Properties

Description: All of the methods that allow for the retrieval of properties for CMIS Objects have a ~~“~~"Property Filter~~”~~" as an optional parameter, which allows the caller to specify a subset of properties for Objects that MUST be returned by the repository in the output of the method.

Optional Input Parameter:

- **String filter:** Value indicating which properties for Objects MUST be returned. Values are:
  - ~~o~~ **Not set:** The set of properties to be returned MUST be determined by the repository.
  - ~~o~~ **A comma-delimited list of property definition Query Names: The properties listed MUST be returned.**
  - ~~o~~ **~~“~~"*~~”~~" :** All properties MUST be returned for all objects.

~~Repositories SHOULD return only the properties specified in the property filter if they exist on the object’s type definition.~~If a property is requested by a filter, a property element MUST be returned for that property. A repository MAY return additional properties. If a returned property is in a ~~"~~"not set~~"~~" state, a value element MUST NOT be returned for that property.

If a property filter specifies a property that is ~~‘~~'not set~~’~~', it MUST be represented as a property element without a value element.

2.2.1.2.2 Relationships

Description: Used to retrieve the relationships in which the object(s) are participating.

Optional Input Parameter:

- **Enum includeRelationships:** Value indicating what relationships in which the objects returned participate MUST be returned, if any. Values are:
  - `none`**:** No relationships MUST be returned. (Default).
  - `source`**:** Only relationships in which the objects returned are the source MUST be returned.
  - `target`**:** Only relationships in which the objects returned are the target MUST be returned.
  - `both`**:** Relationships in which the objects returned are the source or the target MUST be returned.

Output Parameter for each object:

- **<Array> Relationships:** A collection of the relationship objects.

2.2.1.2.3 Policies

Description: Used to retrieve the policies currently applied to the object(s).

Optional Input Parameter:

- **Boolean** `includePolicyIds`**:** If TRUE, then the Repository MUST return the Ids of the policies applied to the object. Defaults to FALSE.

Output Parameter or each object:

- **<Array> Policies:** A collection of the policy objects.

2.2.1.2.4 Renditions

Description: Used to retrieve the renditions of the object(s).

Optional Input Parameter:

- **String renditionFilter:** The Repository MUST return the set of renditions whose kind matches this filter. See section below for the filter grammar.
  - Defaults to ~~“~~'cmis:none~~”~~'.

Output Parameter for each object:

- **<Array> Renditions:** The set of renditions.

2.2.1.2.4.1 Rendition Filter Grammar

The Rendition Filter grammar is defined as follows:

```
<renditionInclusion> ::= <none> | <wildcard> | <termlist>
<termlist> ::= <term> | <term> ~~'~~',~~'~~' <termlist>
<term> ::= <kind> | <mimetype>
<kind> ::= <text>
<mimetype> ::= <type> ~~'~~'/~~'~~' <subtype>
<type> ::= <text>
<subtype> ::= <text> | <wildcard>
<text> ::= ~~/*~~ !! any char except whitespace~~ */~~
<wildcard> ::= ~~'~~'*~~'~~'
<none> ::= ~~'~~'cmis:none~~'~~'
```

An inclusion pattern allows:

- **Wildcard** : include all associated Renditions
- **Comma-separated list of Rendition kinds or mimetypes** : include only those Renditions that match one of the specified kinds or mimetypes
- **`cmis:none`**: (Default) exclude all associated Renditions

Examples:

- * (include all Renditions)
- `cmis:thumbnail` (include only Thumbnails)
- Image/* (include all image Renditions)
- application/pdf, application/x-shockwave-flash (include web ready Renditions)
- `cmis:none` (exclude all Renditions)

2.2.1.2.5 ACLs

Description: Used to retrieve the ACLs for the object(s) described in the service response.

Optional Input Parameter:

- **Boolean** `includeACL`**:** If TRUE, then the Repository MUST return the ACLs for each object in the result set. Defaults to FALSE.

Output Parameter for each object:

- **<Array> ACLs:** The list of access control entries of the ACL for the object.

2.2.1.2.6 Allowable Actions

Description: Used to retrieve the allowable actions for the object(s) described in the service response.

Optional Input Parameter:

- **Boolean** `includeAllowableActions`**:** If TRUE, then the Repository MUST return the available actions for each object in the result set. Defaults to FALSE.

Output Parameter for each object:

- **<Array> AllowableActions:** The list of allowable actions for the object.~~See `cmisAllowableActionsType` in the CMIS schema.~~

2.2.1.3 Change Tokens

The CMIS base object-type definitions include an opaque string ~~“~~"ChangeToken~~”~~" property that a Repository MAY use for optimistic locking and/or concurrency checking to ensure that user updates do not conflict.

If a Repository provides values for the ChangeToken property for an Object, then all invocations of the ~~“~~"update~~”~~" methods on that object (updateProperties, setContentStream, deleteContentStream) MUST provide the value of the changeToken property as an input parameter, and the Repository MUST throw an updateConflictException if the value specified for the changeToken does NOT match the changeToken value for the object being updated.

2.2.1.4 Exceptions

The following sections list the complete set of exceptions that MAY be returned by a repository in response to a CMIS service method call.

2.2.1.4.1 General Exceptions

The following exceptions MAY be returned by a repository in response to ANY CMIS service method call.

The ~~“~~"Cause~~”~~" field indicates the circumstances under which a repository SHOULD return a particular exception.

`invalidArgument`

Cause: One or more of the input parameters to the service method is missing or invalid.

`objectNotFound`

Cause: The service call has specified an object that does not exist in the Repository.

`notSupported`

Cause: The service method invoked requires an optional capability not supported by the repository.

`permissionDenied`

Cause: The caller of the service method does not have sufficient permissions to perform the operation.

`runtime`

Cause: Any other cause not expressible by another CMIS exception.

2.2.1.4.2 Specific Exceptions

The following exceptions MAY be returned by a repository in response to one or more CMIS service methods calls.

For each exception, the general intent is listed as well as a list of the methods which MAY cause the exception to be thrown.

`constraint`

Intent: The operation violates a Repository- or Object-level constraint defined in the CMIS domain model.

Methods:

- **Navigation Services:**
  - getObjectParents
- **Object Services:**
  - createDocument
  - createDocumentFromSource
  - createFolder
  - createRelationship
  - createPolicy
  - updateProperties
  - moveObject
  - deleteObject
  - setContentStream
  - deleteContentStream
- **Multi-filing Services:**
  - addObjectToFolder
- **Versioning Services:**
  - checkOut
  - cancelCheckOut
  - checkIn
- **Policy Services:**
  - applyPolicy
  - removePolicy
- **Change Log Services:**
  - getContentChanges

`contentAlreadyExists`

Intent: The operation attempts to set the content stream for a Document that already has a content stream without explicitly specifying the ~~“~~"overwriteFlag~~”~~" parameter.

Methods:

- **Object Services:**
  - setContentStream

filterNotValid

Intent: The property filter or rendition filter input to the operation is not valid.

Methods:

- **Navigation Services:**
  - getDescendants
  - getChildren
  - getFolderParent
  - getObjectParents
  - getCheckedOutDocs
- **Object Services:**
  - getProperties
  - getRenditions
  - getObject
  - getObjectByPath
- **Versioning Services:**
  - getPropertiesOfLatestVersion
  - getAllVersions
- **Policy Services:**
  - getAppliedPolicies

nameConstraintViolation

Intent: The repository is not able to store the object that the user is creating/updating due to a name constraint violation.

Methods:

- **Object Services:**
  - createDocument
  - createDocumentFromSource
  - createFolder
  - createRelationship
  - createPolicy
  - updateProperties
  - moveObject

storage

Intent: The repository is not able to store the object that the user is creating/updating due to an internal storage problem.

Methods:

- **Object Services:**
  - createDocument
  - createDocumentFromSource
  - createFolder
  - createRelationship

- createPolicy
- updateProperties
- moveObject
- setContentStream
- deleteContentStream

- **Versioning Services:**
  - checkOut
  - checkIn

`streamNotSupported`

Intent: The operation is attempting to get or set a contentStream for a Document whose Object-type specifies that a content stream is not allowed for Document~~’~~'s of that type.

Methods:

- **Object Services:**
  - createDocument
  - createDocumentFromSource
  - getContentStream
  - setContentStream
- **Versioning Services:**
  - checkIn

`updateConflict`

Intent: The operation is attempting to update an object that is no longer current (as determined by the repository).

Methods:

- **Object Services:**
  - updateProperties
  - moveObject
  - deleteObject
  - deleteTree
  - setContentStream
  - deleteContentStream
- **Versioning Services:**
  - checkOut
  - cancelCheckOut
  - checkIn

`versioning`

Intent: The operation is attempting to perform an action on a non-current version of a Document that cannot be performed on a non-current version.

Methods:

- **Object Services:**

    - updateProperties
    - moveObject
    - setContentStream
    - deleteContentStream
- **Versioning Services:**
    - checkOut
    - cancelCheckOut
    - checkIn

2.2.1.5 ACLs

Those services which allow for the setting of ACLs may take the optional macro cmis:user which allows the caller to indicate the operation applies to the current authenticated user.

2.2.2 Repository Services

The Repository Services (getRepositories, getRepositoryInfo, getTypeChildren, getTypeDescendants, getTypeDefinition) are used to discover information about the repository, including information about the repository and the object-types defined for the repository.

2.2.2.1 getRepositories

Description: Returns a list of CMIS repositories available from this CMIS service endpoint.

2.2.2.1.1 Inputs

None.

2.2.2.1.2 Outputs

A list of repository information, with (at least) the following information for each entry:

- **ID repositoryId:** The identifier for the Repository.
- **String repositoryName:** A display name for the Repository.

2.2.2.1.3 Exceptions Thrown & Conditions

See section 2.2.1.4.1 General Exceptions

2.2.2.2 getRepositoryInfo

Description: Returns information about the CMIS repository, the optional capabilities it supports and its Access Control information if applicable. .

2.2.2.2.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.

2.2.2.2.2 Outputs

- **ID** `repositoryId`**:** The identifier for the Repository.
    - Note: This MUST be the same identifier as the input to the method.
- **String** `repositoryName`**:** A display name for the Repository.
- **String** `repositoryDescription`**:** A display description for the Repository.

- **String** `vendorName`**:** A display name for the vendor of the Repository~~’~~'s underlying application.
- **String** `productName`**:** A display name for the Repository~~’~~'s underlying application.
- **String** `productVersion`**:** A display name for the version number of the Repository~~’~~'s underlying application.
- **ID** `rootFolderId`**:** The ID of the Root Folder Object for the Repository.
- **<List of capabilities>:** The set of values for the repository-optional capabilities specified in section 2.1.1.1 Optional Capabilities
- **String** `latestChangeLogToken`**:** The change log token corresponding to the most recent change event for any object in the repository.
- **String** `cmisVersionSupported`**:** A decimal that indicates what version of the CMIS specification this repository supports as specified in 2.1.1.2 Implementation Information.
- **URI** `thinClientURI`: A optional repository-specific URI pointing to the repository~~’~~'s web interface.
- **Boolean** `changesIncomplete`: Indicates whether or not the repository~~’~~'s change log can return all changes ever made to any object in the repository or only changes made after a particular point in time. Applicable when the repository~~’~~'s optional capability `capabilityChanges` is not `none`.
  - If FALSE, then the change log can return all changes ever made to every object.
  - If TRUE, then the change log includes all changes made since a particular point in time, but not all changes ever made.
- **<List of enum values>** `changesOnType`**:** Indicates whether changes are available for base types in the repository. Valid values are from enumBaseObjectTypeIds. See section 2.1.11 Change Log.
  - **cmis:**document
  - **cmis:**folder
  - **cmis:**policy
  - **cmis:**relationship
- **Enum** `supportedPermissions`: specifies which types of permissions are supported.
  - basic: indicates that the CMIS Basic permissions are supported.
  - repository: Indicates that repository specific permissions are supported.
  - both: indicates that both CMIS basic permissions and repository specific permissions are supported.
- **Enum** `propagation`: The list of allowed values for applyACL, which control how non-direct ACEs are handled by the repository:
  - `objectonly`**:** indicates that the repository is able to apply ACEs without changing the ACLs of other objects – i.e. ACEs are applied, potentially ~~“~~"breaking~~”~~" the ~~“~~"sharing~~”~~" dependency for non-direct ACEs.
  - `propagate`**:** indicates that the repository is able to apply ACEs to a given object and propagate this change to all inheriting objects – i.e. ACEs are applied with the (intended) side effect to inheriting objects.
  - `repositorydetermined`**:** indicates that the repository uses its own mechanisms to handle non-direct ACEs when applying ACLs.
- **<Array> Permission** `permissions`**:** The list of repository-specific permissions the repository supports for managing ACEs (see section 2.8 Access Control).
- **<Array> PermissionMapping** `mapping`**:** The list of mappings for the CMIS Basic permissions to allowable actions (see section 2.8 Access Control).

- **String** principalAnonymous: If set, this field holds the principal who is used for anonymous access. This principal can then be passed to the ACL services to specify what permissions anonymous users should have.
- **String** principalAnyone: If set, this field holds the principal who is used to indicate any authenticated user. This principal can then be passed to the ACL services to specify what permissions any authenticated user should have.

The cmisRepositoryInfoType schema describes the markup that will be included in all CMIS protocol bindings to implement this service.

2.2.2.2.3 Exceptions Thrown & Conditions

See section 2.2.1.4.1 General Exceptions

2.2.2.3 getTypeChildren

Description: Returns the list of Object-Types defined for the Repository that are children of the specified Type.

2.2.2.3.1 Inputs

Required:

- **String repositoryId:** The identifier for the Repository.

Optional:

- **String typeId:** The typeId of an Object-Type specified in the Repository.
  - If specified, then the Repository MUST return all of child types of the specified type.
  - If not specified, then the Repository MUST return all Base Object-Types.
- **Boolean includePropertyDefinitions:** If TRUE, then the Repository MUST return the property definitions for each Object-Type returned.
  - If FALSE (default), the Repository MUST return only the attributes for each Object-Type.
- **Integer maxItems:** See section 2.2.1.1 Paging.
- **Integer skipCount:** See section 2.2.1.1 Paging.

2.2.2.3.2 Outputs

<Array> Object-Types: The list of child Object-Types defined for the given typeId.

Boolean hasMoreItems: See section 2.2.1.1 Paging.

Optional:

Integer numItems: See section 2.2.1.1 Paging.

2.2.2.3.3 Exceptions Thrown & Conditions

See section 2.2.1.4.1 General Exceptions

2.2.2.4 getTypeDescendants

Description: Returns the set of descendant Object-Types defined for the Repository under the specified Type.

Notes:

- This method does NOT support paging as defined in the 2.2.1.1 Paging section.
- The order in which results are returned is respository-specific.

2.2.2.4.1 Inputs

Required:

- **String repositoryId:** The identifier for the Repository.

Optional:

- **String typeId:** The typeId of an Object-Type specified in the Repository.
  - If specified, then the Repository MUST return all descendant types for the specified type.
  - If not specified, then the Repository MUST return all types and MUST ignore the value of the depth parameter
- **Integer depth:** The number of levels of depth in the type hierarchy from which to return results. Valid values are:
  - **1:** Return only types that are children of the type.
  - **<Integer value greater than 1>:** Return only types that are children of the type and descendants up to <value> levels deep.
  - **-1:** Return ALL descendant types at all depth levels in the CMIS hierarchy.
  - The default value is repository specific and SHOULD be at least 2 or -1.
- **Boolean includePropertyDefinitions:** If TRUE, then the Repository MUST return the property definitions for each Object-Type returned.
  - If FALSE (default), the Repository MUST return only the attributes for each Object-Type.

2.2.2.4.2 Outputs

<Array> Object-Types: The hierarchy of Object-Types defined for the Repository.

2.2.2.4.3 Exceptions Thrown & Conditions

See section 2.2.1.4.1 General Exceptions

- **`invalidArgument:`** The Repository MUST throw this exception if the service is invoked with an invalid depth.

2.2.2.5 getTypeDefinition

Description: Gets the definition of the specified Object-Type.Inputs

2.2.2.5.1 Inputs

Required:

- **String repositoryId:** The identifier for the Repository.
- **String typeId:** The typeId of an Object-Type specified in the Repository.

2.2.2.5.2 Outputs

- Object-type including all property definitions. See section 2.1.3.3 (Object-Type Property Definitions) for further details.

2.2.2.5.3 Exceptions Thrown & Conditions

See section 2.2.1.4.1 General Exceptions

2.2.3 Navigation Services

The Navigation Services (getDescendants, getChildren, getFolderParent, getObjectParents, getCheckedoutDocs), are used to traverse the folder hierarchy in a CMIS **Repository**, and to locate Documents that are checked out.

2.2.3.1 getChildren

Description: Gets the list of child objects contained in the specified folder.

Notes:

- If the Repository supports the optional ~~“~~"VersionSpecificFiling~~”~~" capability, then the repository MUST return the document versions filed in the specified folder.
    - Otherwise, the latest version of the documents MUST be returned.

2.2.3.1.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **ID folderId:** The identifier for the folder.

Optional:

- **Integer maxItems:** See section 2.2.1.1 Paging.
- **Integer skipCount:** See section 2.2.1.1 Paging.
- **String orderBy:** The orderBy parameter MUST be a comma-separated list of query names and the ascending modifier ~~“~~"ASC~~”~~" or the descending modifier ~~“~~"DESC~~”~~" for each query name. A repository~~’~~'s handling of the orderBy input is repository-specific.
- **String filter:** See section 2.2.1.2.1 Properties. The service will only return the properties in the matched object if they exist on the matched object type definition and in the filter.
- **Enum includeRelationships:** See section 2.2.1.2.2 Relationships.
- **String renditionFilter:** See section 2.2.1.2.4 Renditions.
- **Boolean includeAllowableActions:** See section 2.2.1.2.6 Allowable Actions.
- **Boolean includePathSegment:** Defaults to FALSE. If TRUE, returns a PathSegment for each child object for use in constructing that object~~’~~'s path.

2.2.3.1.2 Outputs

- **<Array> ObjectResults:** A list of the child objects for the specified folder. Each object result MUST include the following elements if they are requested:
    - **<Array> Properties:** The list of properties for the object.
    - **<Array> Relationships:** See section 2.2.1.2.2 Relationships.
    - **<Array> Renditions:** See section 2.2.1.2.4 Renditions.
    - **AllowableActions:** See section 2.2.1.2.6 Allowable Actions.
    - **String PathSegment:** If includePathSegment was TRUE. See section 2.1.5.3 Paths.
- **Boolean hasMoreItems**: See section 2.2.1.1 Paging.

Optional:

Integer numItems: See section 2.2.1.1 Paging.

2.2.3.1.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions

- `filterNotValid`**:** The Repository MUST throw this exception if the~~is~~ property or rendition filter input parameter is not valid.
- `invalidArgument`: if the specified folder is not a folder

2.2.3.2 getDescendants

Description: Gets the set of descendant objects contained in the specified folder or any of its child-folders.

Notes:

- This method does NOT support paging as defined in the 2.2.1.1 Paging section.
- The order in which results are returned is respository-specific..
- If the Repository supports the optional capability `capabilityVersionSpecificFiling`, then the repository MUST return the document versions filed in the specified folder or its descendant folders. Otherwise, the latest version of the documents MUST be returned.
- If the Repository supports the optional capability `capabilityMutlifiling` and the same document is encountered multiple times in the hierarchy, then the repository MUST return that document each time is encountered.

2.2.3.2.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **ID folderId:** The identifier for the folder.

Optional:

- **Integer depth:** The number of levels of depth in the folder hierarchy from which to return results. Valid values are:
  - **1:** Return only objects that are children of the folder.
  - **<Integer value greater than 1>:** Return only objects that are children of the folder and descendants up to <value> levels deep.
  - **-1:** Return ALL descendant objects at all depth levels in the CMIS hierarchy.
  - The default value is repository specific and SHOULD be at least 2 or -1
- **String filter:** See section 2.2.1.2.1 Properties.
- **Enum includeRelationships:** See section 2.2.1.2.2 Relationships.
- **String renditionFilter:** See section 2.2.1.2.4 Renditions.
- **Boolean includeAllowableActions:** See section 2.2.1.2.6 Allowable Actions.
- **Boolean includePathSegment:** Defaults to FALSE. If TRUE, returns a PathSegment for each child object for use in constructing that object~~’~~'s path.

2.2.3.2.2 Outputs

- **<Array> ObjectResults:** A list of the descendant objects for the specified folder. Each object result MUST include the following elements if they are requested:
  - **<Array> Properties:** The list of properties for the object.
  - **<Array> Relationships:** See section 2.2.1.2.2 Relationships.
  - **<Array> Renditions:** See section 2.2.1.2.4 Renditions.
  - **AllowableActions:** See section 2.2.1.2.6 Allowable Actions.
  - **String PathSegment:** If includePathSegment was TRUE. See section 2.1.5.3 Paths.

2.2.3.2.3 Exceptions Thrown & Conditions

See section 2.2.1.4.1 General Exceptions

- `filterNotValid`**:** The Repository MUST throw this exception if the~~is~~ property or rendition filter input parameter is not valid.
- `invalidArgument`: The Repository MUST throw this exception if the service is invoked with ~~“~~"depth = 0~~”~~".
- `invalidArgument`: if the specified folder is not a folder

2.2.3.3 getFolderTree

Description: Gets the set of descendant folder objects contained in the specified folder.

Notes:

- This method does NOT support paging as defined in the 2.2.1.1 Paging section.
- The order in which results are returned is respository-specific..

2.2.3.3.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **ID folderId:** The identifier for the folder.

Optional:

- **Integer depth:** The number of levels of depth in the folder hierarchy from which to return results. Valid values are:
    - **1:** Return only folders that are children of the folder.
    - **<Integer value greater than 1>:** Return only folders that are children of the folder and descendant folders up to <value> levels deep.
    - **-1:** Return ALL descendant folders at all depth levels in the CMIS hierarchy.
    - The default value is repository specific and SHOULD be at least 2 or -1
- **String filter:** See section 2.2.1.2.1 Properties.
- **Enum includeRelationships:** See section 2.2.1.2.2 Relationships.
- **String renditionFilter:** See section 2.2.1.2.4 Renditions.
- **Boolean includeAllowableActions:** See section 2.2.1.2.6 Allowable Actions.
- **Boolean includePathSegment:** Defaults to FALSE. If TRUE, returns a PathSegment for each child object for use in constructing that object~~’~~'s path.

2.2.3.3.2 Outputs

- **<Array> ObjectResults:** A list of the descendant folders for the specified folder. Each object result MUST include the following elements if they are requested:
    - **<Array> Properties:** The list of properties for the object.
    - **<Array> Relationships:** See section 2.2.1.2.2 Relationships.
    - **<Array> Renditions:** See section 2.2.1.2.4 Renditions.
    - **AllowableActions:** See section 2.2.1.2.6 Allowable Actions.
    - **String pathSegment:** If includePathSegment was TRUE. See section 2.1.5.3 Paths.

2.2.3.3.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- `filterNotValid`**:** The Repository MUST throw this exception if the~~is~~ property or rendition filter input parameter is not valid.
- `invalidArgument:` The Repository MUST throw this exception if the service is invoked with an invalid depth
- `invalidArgument`: if the specified folder is not a folder

2.2.3.4 getFolderParent

Description: Gets the parent folder object for the specified folder object.

2.2.3.4.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **ID folderId:** The identifier for the folder.

Optional:

- **String filter:** See section 2.2.1.2.1 Properties.

2.2.3.4.2 Outputs

- **Object:** The parent folder object of the specified folder.

2.2.3.4.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- `filterNotValid`**:** The Repository MUST throw this exception if this property filter input parameter is not valid.
- `invalidArgument`: The Repository MUST throw this exception if the folderId input is the root folder.

2.2.3.5 getObjectParents

Description: Gets the parent folder(s) for the specified non-folder, fileable object.

2.2.3.5.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **ID objectId:** The identifier for the object.

Optional:

- **String filter:** See section 2.2.1.2.1 Properties
- **Enum includeRelationships:** See section 2.2.1.2.2 Relationships.
- **String renditionFilter:** See section 2.2.1.2.4 Renditions.
- **Boolean includeAllowableActions:** See section 2.2.1.2.6 Allowable Actions.
- **Boolean includeRelativePathSegment:** See section 2.1.5.3 Paths.

2.2.3.5.2 Outputs

- **<Array> ObjectResults:** A list of the parent folder(s) of the specified objects. Empty for unfiled objects or for the root folder. Each object result MUST include the following elements if they are requested:
    - **<Array> Properties:** The list of properties for the object.
    - **<Array> Relationships:** See section 2.2.1.2.2 Relationships.
    - **<Array> Renditions:** See section 2.2.1.2.4 Renditions.
    - **AllowableActions:** See section 2.2.1.2.6 Allowable Actions.
    - **String relativePathSegment:** If includeRelativePathSegment was TRUE. See section 2.1.5.3 Paths.

2.2.3.5.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- `constraint`**:** The Repository MUST throw this exception if this method is invoked on an object who Object-Type Definition specifies that it is not fileable.
- `filterNotValid`: The Repository MUST throw this exception if the~~is~~ property or rendition filter input parameter is not valid.

2.2.3.6 getCheckedOutDocs

Description: Gets the list of documents that are checked out that the user has access to.

2.2.3.6.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.

Optional:

- **ID folderId:** The identifier for a folder in the repository from which documents should be returned.
    - If specified, the Repository MUST only return checked out documents that are child-objects of the specified folder.
    - If not specified, the Repository MUST return checked out documents from anywhere in the repository hierarchy.
- **Integer maxItems:** See section 2.2.1.1 Paging.
- **Integer skipCount:** See section 2.2.1.1 Paging.
- **String orderBy:** The orderBy parameter MUST be a comma-separated list of query names and the ascending modifier ~~“~~"ASC~~”~~" or the descending modifier ~~“~~"DESC~~”~~" for each query name. A repository~~’~~'s handling of the orderBy input is repository-specific.
- **String filter:** See section 2.2.1.2.1 Properties.
- **Enum includeRelationships:** See section 2.2.1.2.2 Relationships.
- **String renditionFilter:** See section 2.2.1.2.4 Renditions.
- **Boolean includeAllowableActions:** See section 2.2.1.2.6 Allowable Actions.

2.2.3.6.2 Outputs

- **<Array> ObjectResults:** A list of checked out documents. Each object result MUST include the following elements if they are requested:
    - **<Array> Properties:** The list of properties for the object.
    - **<Array> Relationships:** See section 2.2.1.2.2 Relationships.

    - **<Array> Renditions:** See section 2.2.1.2.4 Renditions.
    - **AllowableActions:** See section 2.2.1.2.6 Allowable Actions.
- **Boolean hasMoreItems**: See section 2.2.1.1 Paging.

Optional:

- **Integer numItems:** See section 2.2.1.1 Paging.

2.2.3.6.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- `filterNotValid`**:** The Repository MUST throw this exception if ~~this~~ the property or rendition filter input parameter is not valid.

2.2.4 Object Services

CMIS provides ID-based CRUD (**C**reate, **R**etrieve, **U**pdate, **D**elete), operations on objects in a Repository.

2.2.4.1 createDocument

Description: Creates a document object of the specified type (given by the cmis:objectTypeId property) in the (optionally) specified location.

2.2.4.1.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **<Array> properties:** The property values that MUST be applied to the newly-created Document Object.

Optional:

- **ID folderId:** If specified, the identifier for the folder that MUST be the parent folder for the newly-created Document Object.
    - This parameter MUST be specified if the Repository does NOT support the optional "unfiling" capability.
- **<contentStream> contentStream:** The Content Stream that MUST be stored for the newly-created Document Object. The method of passing the contentStream to the server and the encoding mechanism will be specified by each specific binding. MUST be required if the type requires it.
- **Enum versioningState:** An enumeration specifying what the versioing state of the newly-created object MUST be. If the repository does not support versioning, the repository MUST ignore the versioningState parameter. Valid values are:
    - `none`: The document MUST be created as a non-versionable document.
    - `checkedout`**:** The document MUST be created in the checked-out state. The checked-out document MAY be visible to other users.
    - `major` **(default):** The document MUST be created as a major version
    - `minor`**:** The document MUST be created as a minor version.
- **<Array> policies:** A list of policy IDs that MUST be applied to the newly-created Document object.
- **<Array> ACE addACEs:** A list of ACEs that MUST be added to the newly-created Document object, either using the ACL from folderId if specified, or being applied if no folderId is specified.

- **<Array> ACE removeACEs:** A list of ACEs that MUST be removed from the newly-created Document object, either using the ACL from folderId if specified, or being ignored if no folderId is specified.

2.2.4.1.2 Outputs

ID objectId: The ID of the newly-created document.

2.2.4.1.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- `constraint`**:** The Repository MUST throw this exception if ANY of the following conditions are met:
  - The cmis:objectTypeId property value is not an Object-Type whose baseType is ~~“~~"Document~~”~~".
  - The cmis:objectTypeId property value is NOT in the list of AllowedChildObjectTypeIds of the parent-folder specified by folderId.
  - The value of any of the properties violates the min/max/required/length constraints specified in the property definition in the Object-Type.
  - The ~~“~~"contentStreamAllowed~~”~~" attribute of the Object-Type definition specified by the cmis:objectTypeId property value is set to ~~“~~"required~~”~~" and no contentStream input parameter is provided.
  - The ~~“~~"versionable~~”~~" attribute of the Object-Type definition specified by the cmis:objectTypeId property value is set to FALSE and a value for the versioningState input parameter is provided that is something other than ~~“~~"`none`~~”~~".
  - The ~~“~~"versionable~~”~~" attribute of the Object-Type definition specified by the cmis:objectTypeId property value is set to TRUE and the value for the versioningState input parameter is provided that is ~~“~~"`none`~~”~~".
  - The ~~“~~"controllablePolicy~~”~~" attribute of the Object-Type definition specified by the cmis:objectTypeId property value is set to FALSE and at least one policy is provided.
  - The ~~“~~"controllableACL~~”~~" attribute of the Object-Type definition specified by the cmis:objectTypeId property value is set to FALSE and at least one ACE is provided.
  - At least one of the permissions is used in an ACE provided which is not supported by the repository.
- `nameConstraintViolation`: See section 2.2.1.4.2 Specific Exceptions. If the repository detects a violation with the given cmis:name property value, the repository MAY throw this exception or chose a name which does not conflict.
- `storage`: See section 2.2.1.4.2 Specific Exceptions.
- `streamNotSupported`**:** The Repository MUST throw this exception if the ~~“~~"contentStreamAllowed~~”~~" attribute of the Object-Type definition specified by the cmis:objectTypeId property value is set to ~~“~~"not allowed~~”~~" and a contentStream input parameter is provided.

2.2.4.2 createDocumentFromSource

Description: Creates a document object as a copy of the given source document in the (optionally) specified location.

2.2.4.2.1 Inputs

Required:

~~o~~• **ID repositoryId:** The identifier for the Repository.

- **ID sourceId:** The identifier for the source document.

Optional:

- **<Array> properties:** The property values that MUST be applied to the Object. This list of properties SHOULD only contain properties whose values differ from the source document.
- **ID folderId:** If specified, the identifier for the folder that MUST be the parent folder for the newly-created Document Object.
    - This parameter MUST be specified if the Repository does NOT support the optional "unfiling" capability.
- **Enum versioningState:** An enumeration specifying what the versioning state of the newly-created object MUST be. If the repository does not support versioning, the repository MUST ignore the versioningState parameter. Valid values are:
    - `none`: The document MUST be created as a non-versionable document.
    - `checkedout`**:** The document MUST be created in the checked-out state.
    - `major` **(default):** The document MUST be created as a major version
    - `minor`**:** The document MUST be created as a minor version.
- **<Array> policies:** A list of policy IDs that MUST be applied to the newly-created Document object.
- **<Array> ACE addACEs:** A list of ACEs that MUST be added to the newly-created Document object, either using the ACL from folderId if specified, or being applied if no folderId is specified.
- **<Array> ACE removeACEs:** A list of ACEs that MUST be removed from the newly-created Document object, either using the ACL from folderId if specified, or being ignored if no folderId is specified.

2.2.4.2.2 Outputs

ID objectId: The ID of the newly-created document.

2.2.4.2.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- `constraint`**:** The Repository MUST throw this exception if ANY of the following conditions are met:
    - The sourceId is not an Object whose baseType is "Document".
    - The source document's cmis:objectTypeId property value is NOT in the list of AllowedChildObjectTypeIds of the parent-folder specified by folderId.
    - The "versionable" attribute of the Object-Type definition specified by the cmis:objectTypeId property value is set to FALSE and a value for the versioningState input parameter is provided that is something other than "`none`".
    - The "versionable" attribute of the Object-Type definition specified by the cmis:objectTypeId property value is set to TRUE and the value for the versioningState input parameter is provided that is "`none`".
    - The "controllablePolicy" attribute of the Object-Type definition specified by the cmis:objectTypeId property value is set to FALSE and at least one policy is provided.
    - The "controllableACL" attribute of the Object-Type definition specified by the cmis:objectTypeId property value is set to FALSE and at least one ACE is provided.
    - At least one of the permissions is used in an ACE provided which is not supported by the repository.

- `nameConstraintViolation`: See section 2.2.1.4.2 Specific Exceptions. If the repository detects a violation with the given cmis:name property value, the repository MAY throw this exception or chose a name which does not conflict.
- `storage`: See section 2.2.1.4.2 Specific Exceptions.
- `streamNotSupported`**:** The Repository MUST throw this exception if the ~~“~~"contentStreamAllowed~~”~~" attribute of the Object-Type definition specified by the cmis:objectTypeId property value is set to ~~“~~"not allowed~~”~~" and a contentStream input parameter is provided.

2.2.4.3 createFolder

Description: Creates a folder object of the specified type in the specified location.

2.2.4.3.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **<Array> properties:** The property values that MUST be applied to the newly-created Folder Object.
- **ID folderId:** The identifier for the folder that MUST be the parent folder for the newly-created Folder Object.

Optional:

- **<Array> policies:** A list of policy IDs that MUST be applied to the newly-created Folder object.
- **<Array> ACE addACEs:** A list of ACEs that MUST be added to the newly-created Folder object, either using the ACL from folderId if specified, or being applied if no folderId is specified.
- **<Array> ACE removeACEs:** A list of ACEs that MUST be removed from the newly-created Folder object, either using the ACL from folderId if specified, or being ignored if no folderId is specified.

2.2.4.3.2 Outputs

~~□~~○ **ID objectId:** The ID of the newly-created folder.

2.2.4.3.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- **`constraint`:** The Repository MUST throw this exception if ANY of the following conditions are met:
  - The cmis:objectTypeId property value is not an Object-Type whose baseType is ~~“~~"Folder~~”~~".
  - The value of any of the properties violates the min/max/required/length constraints specified in the property definition in the Object-Type.
  - The cmis:objectTypeId property value is NOT in the list of AllowedChildObjectTypeIds of the parent-folder specified by folderId.
  - The ~~“~~"controllablePolicy~~”~~" attribute of the Object-Type definition specified by the cmis:objectTypeId property value is set to FALSE and at least one policy is provided.
  - The ~~“~~"controllableACL~~”~~" attribute of the Object-Type definition specified by the cmis:objectTypeId property value is set to FALSE and at least one ACE is provided.
  - At least one of the permissions is used in an ACE provided which is not supported by the repository.

- `nameConstraintViolation`: See section 2.2.1.4.2 Specific Exceptions. If the repository detects a violation with the given cmis:name property value, the repository MAY throw this exception or chose a name which does not conflict.
- `storage`: See section 2.2.1.4.2 Specific Exceptions.

2.2.4.4 createRelationship

Description: Creates a relationship object of the specified type

2.2.4.4.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **<Array> properties:** The property values that MUST be applied to the newly-created Relationship Object.

Optional:

- **<Array> policies:** A list of policy IDs that MUST be applied to the newly-created Replationship object.
- **<Array> ACE addACEs:** A list of ACEs that MUST be added to the newly-created Relationship object, either using the ACL from folderId if specified, or being applied if no folderId is specified. **<Array> ACE removeACEs:** A list of ACEs that MUST be removed from the newly-created Relationship object, either using the ACL from folderId if specified, or being ignored if no folderId is specified.

2.2.4.4.2 Outputs

- **ID objectId:** The ID of the newly-created relationship.

2.2.4.4.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- `constraint`**:** The Repository MUST throw this exception if ANY of the following conditions are met:
  - The cmis:objectTypeId property value is not an Object-Type whose baseType is ~~“~~"Relationship~~”~~".
  - The value of any of the properties violates the min/max/required/length constraints specified in the property definition in the Object-Type.
  - The sourceObjectId~~’~~'s ObjectType is not in the list of ~~“~~"allowedSourceTypes~~”~~" specified by the Object-Type definition specified by cmis:objectTypeId property value.
  - The targetObjectId~~’~~'s ObjectType is not in the list of ~~“~~"allowedTargetTypes~~”~~" specified by the Object-Type definition specified by cmis:objectTypeId property value.
  - The ~~“~~"controllablePolicy~~”~~" attribute of the Object-Type definition specified by the cmis:objectTypeId property value is set to FALSE and at least one policy is provided.
  - The ~~“~~"controllableACL~~”~~" attribute of the Object-Type definition specified by the cmis:objectTypeId property value is set to FALSE and at least one ACE is provided.
  - At least one of the permissions is used in an ACE provided which is not supported by the repository.
- `nameConstraintViolation`: See section 2.2.1.4.2 Specific Exceptions. If the repository detects a violation with the given cmis:name property value, the repository MAY throw this exception or chose a name which does not conflict.
- `storage`: See section 2.2.1.4.2 Specific Exceptions.

2.2.4.5 createPolicy

Description: Creates a policy object of the specified type

2.2.4.5.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **<Array> properties:** The property values that MUST be applied to the newly-created Policy Object.

Optional:

- **ID folderId:** If specified, the identifier for the folder that MUST be the parent folder for the newly-created Policy Object.
    - ~~o~~ This parameter MUST be specified if the Repository does NOT support the optional ~~“~~"unfiling~~”~~" capability.
- **<Array> policies:** A list of policy IDs that MUST be applied to the newly-created Policy object.
- **<Array> ACE addACEs:** A list of ACEs that MUST be added to the newly-created Policy object, either using the ACL from folderId if specified, or being applied if no folderId is specified.
- **<Array> ACE removeACEs:** A list of ACEs that MUST be removed from the newly-created Policy object, either using the ACL from folderId if specified, or being ignored if no folderId is specified.

2.2.4.5.2 Outputs

- **ID objectId:** The ID of the newly-created Policy Object.

2.2.4.5.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- `constraint`**:** The Repository MUST throw this exception if ANY of the following conditions are met:
    - The cmis:objectTypeId property value is not an Object-Type whose baseType is ~~“~~"Policy~~”~~".
    - The value of any of the properties violates the min/max/required/length constraints specified in the property definition in the Object-Type.
    - The cmis:objectTypeId property value is NOT in the list of AllowedChildObjectTypeIds of the parent-folder specified by folderId.
    - The ~~“~~"controllablePolicy~~”~~" attribute of the Object-Type definition specified by the cmis:objectTypeId property value is set to FALSE and at least one policy is provided.
    - The ~~“~~"controllableACL~~”~~" attribute of the Object-Type definition specified by the cmis:objectTypeId property value is set to FALSE and at least one ACE is provided.
    - At least one of the permissions is used in an ACE provided which is not supported by the repository.
- `nameConstraintViolation:` See section 2.2.1.4.2 Specific Exceptions. If the repository detects a violation with the given cmis:name property value, the repository MAY throw this exception or chose a name which does not conflict.
- `storage`: See section 2.2.1.4.2 Specific Exceptions.

2.2.4.6 getAllowableActions

Description: Gets the list of allowable actions for an Object (see section.2.2.1.2.6 Allowable Actions).

2.2.4.6.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **ID objectId:** The identifier for the object

2.2.4.6.2 Outputs

- **<Array> AllowableActions:** see section 2.2.1.2.6 Allowable Actions.

2.2.4.6.3 Exceptions Thrown & Conditions

See section 2.2.1.4.1 General Exceptions

2.2.4.7 getObject

Description: Gets the specified information for the Object.

2.2.4.7.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **ID objectId:** The identifier for the object

Optional:

- **String filter:** See section 2.2.1.2.1 Properties.
- **Enum includeRelationships:** See section 2.2.1.2.2 Relationships.
- **Boolean includePolicyIds:** See section 2.2.1.2.3 Policies.
- **String renditionFilter:** See section 2.2.1.2.4 Renditions.
- **Boolean includeACL:** See section 2.2.1.2.5 ACLs.
- **Boolean includeAllowableActions:** See section 2.2.1.2.6 Allowable Actions.

2.2.4.7.2 Outputs

- **<Array> Properties:** The list of properties for the object.
- **<Array> Relationships:** See section 2.2.1.2.2 Relationships.
- **<Array> Policy Ids:** See section 2.2.1.2.3 Policies.
- **<Array> Renditions:** See section 2.2.1.2.4 Renditions.
- **<Array> ACLs:** See section 2.2.1.2.5 ACLs.
- **AllowableActions:** See section 2.2.1.2.6 Allowable Actions.

2.2.4.7.3 Exceptions Thrown & Conditions

See section 2.2.1.4.1 General Exceptions

`filterNotValid`: The Repository MUST throw this exception if the~~is~~ property or rendition filter input parameter is not valid.

2.2.4.8 getProperties

Description: Gets the list of properties for an Object.

2.2.4.8.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **ID objectId:** The identifier for the object

Optional:

- **String filter:** See section 2.2.1.2.1 Properties.

2.2.4.8.2 Outputs

<Array> Properties: The list of properties for the object.

2.2.4.8.3 Exceptions Thrown & Conditions

See section 2.2.1.4.1 General Exceptions

`filterNotValid`**:** The Repository MUST throw this exception if this property filter input parameter is not valid.

2.2.4.9 getObjectByPath

Description: Gets the specified object.

2.2.4.9.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **String path:** The path to the object. See section 2.1.5.3 Paths.

Optional:

- **String filter:** See section 2.2.1.2.1 Properties.
- **Boolean includeAllowableActions:** See section 2.2.1.2.6 Allowable Actions.
- **Enum includeRelationships:** See section 2.2.1.2.2 Relationships.
- **String renditionFilter:** See section 2.2.1.2.4 Renditions.
- **Boolean includePolicyIds:** See section 2.2.1.2.2 Relationships.
- **Boolean includeACL:** See section 2.2.1.2.5 ACLs.

2.2.4.9.2 Outputs

- **<Array> Properties:** The list of properties for the object.
- **AllowableActions:** See section 2.2.1.2.6 Allowable Actions.

2.2.4.9.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- `filterNotValid`**:** The Repository MUST throw this exception if the~~is~~ property or rendition filter input parameter is not valid.

2.2.4.10 getContentStream

Description: Gets the content stream for the specified Document object, or gets a rendition stream for a specified rendition of a document or folder object.

Notes: Each CMIS protocol binding MAY provide a way for fetching a sub-range within a content stream, in a manner appropriate to that protocol.

2.2.4.10.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **ID objectId:** The identifier for the object

Optional:

- **ID streamId:** The identifier for the rendition stream, when used to get a rendition stream. For Documents, if not provided then this method returns the content stream. For Folders, it MUST be provided.

2.2.4.10.2 Outputs

- **<Stream> ContentStream:** The specified content stream or rendition stream for the object.

2.2.4.10.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions

`constraint`: The Repository MUST throw this exception if the object specified by objectId does NOT have a content stream or rendition stream.

2.2.4.11 getRenditions

Description: Gets the list of associated Renditions for the specified object. Only rendition attributes are returned, not rendition stream.

Notes: Each CMIS protocol binding MAY provide a way for fetching a sub-range within a content stream, in a manner appropriate to that protocol.

2.2.4.11.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **ID objectId:** The identifier for the object

Optional:

- **String renditionFilter**: See Section 2.2.1.2.4
- **Integer maxItems**: See section 2.2.1.1 Paging.
- **Integer skipCount**: See section 2.2.1.1 Paging.

2.2.4.11.2 Outputs

- **<Array> Renditions:** The set of renditions available on this object

2.2.4.11.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- `notSupported`: The service method requires functionality that is not supported by the repository
- `filterNotValid`: The rendition filter specified is not valid

2.2.4.12 updateProperties

Description: Updates properties of the specified object.

Notes:

- A Repository MAY automatically create new Document versions as part of an update properties operation. Therefore, the objectId output NEED NOT be identical to the objectId input.
- Each CMIS protocol bindings MUST specify whether the updateProperties service MUST always include all updatable properties, or only those properties whose values are different than the original value of the object.

2.2.4.12.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.

ID objectId: The identifier of the object to be updated.

- **<Array> properties:** The updated property values that MUST be applied to the Object.

Optional:

- **String changeToken:** See section 2.2.1.3 Change Tokens.

2.2.4.12.2 Outputs

- **ID objectId:** The ID of the updated object.
- **String changeToken:** See section 2.2.1.3 Change Tokens.

2.2.4.12.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- `constraint`**:** The Repository MUST throw this exception if the value of any of the properties violates the min/max/required/length constraints specified in the property definition in the Object-Type.
- `nameConstraintViolation`**:** See section 2.2.1.4.2 Specific Exceptions. The repository MAY throw this exception or chose a name which does not conflict.
- `storage`: See section 2.2.1.4.2 Specific Exceptions.
- `updateConflict`: See section 2.2.1.4.2 Specific Exceptions.
- `versioning`: The Repository MUST throw this exception if ANY of the following conditions are met:
    - The object is not checked out and ANY of the properties being updated are defined in their Object-Type definition have an attribute value of *Updatability* when checked-out.
    - Additionally, the repository MAY throw this exception if the object is a non-current Document Version.

2.2.4.13 moveObject

Description: Moves the specified file-able object from one folder to another.

2.2.4.13.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **ID objectId:** The identifier of the object to be moved.
- **ID targetFolderId:** The folder into which the object is to be moved.
- **ID sourceFolderId:** The folder from which the object is to be moved.

2.2.4.13.2 Outputs

- **ID objectId:** The identifier of the object to be moved.

2.2.4.13.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- **invalidArgument:** The Repository MUST throw this exception if the service is invoked with a missing sourceFolderId or the sourceFolderId doesn't match the specified object's parent folder (or one of the parent folders if the repository supports multifiling.).
- constraint**:** The Repository MUST throw this exception if the cmis:objectTypeId property value of the given object is NOT in the list of AllowedChildObjectTypeIds of the parent-folder specified by targetFolderId.
- nameConstraintViolation**:** See section 2.2.1.4.2 Specific Exceptions. The repository MAY throw this exception or chose a name which does not conflict.
- storage: See section 2.2.1.4.2 Specific Exceptions.
- updateConflict: See section 2.2.1.4.2 Specific Exceptions.
- versioning: The repository MAY throw this exception if the object is a non-current Document Version.

2.2.4.14 deleteObject

Description: Deletes the specified object.

2.2.4.14.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **ID objectId:** The identifier of the object to be deleted.

Optional:

- **Boolean allVersions:** If TRUE (default), then delete all versions of the document. If FALSE, delete only the document object specified. The Repository MUST ignore the value of this parameter when this service is invoke on a non-document object or non-versionable document object.

2.2.4.14.2 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- constraint**:** The Repository MUST throw this exception if the method is invoked on a Folder object that contains one or more objects.
- updateConflict: See section 2.2.1.4.2 Specific Exceptions.

2.2.4.15 deleteTree

Description: Deletes the specified folder object and all of its child- and descendant-objects.

Notes:

- A Repository MAY attempt to delete child- and descendant-objects of the specified folder in any order.
- Any child- or descendant-object that the Repository cannot delete MUST persist in a valid state in the CMIS domain model.

- This is not atomic.
- However, if deletesinglefiled is chosen and some objects fail to delete, then single-filed objects are either deleted or kept, never just unfiled. This is so that a user can call this command again to recover from the error by using the same tree.

2.2.4.15.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **ID folderId:** The identifier of the folder to be deleted.

Optional:

- **Boolean allVersions:** If TRUE (default), then delete all versions of the document. If FALSE, delete only the document object specified. The Repository MUST ignore the value of this parameter when this service is invoke on a non-document object or non-versionable document object.
- **Enum** `unfileObjects`**:** An enumeration specifying how the repository MUST process file-able child- or descendant-objects. Valid values are:
  - `unfile`**:** Unfile all fileable objects.
  - `deletesinglefiled`**:** Delete all fileable non-folder objects whose only parent-folders are in the current folder tree. Unfile all other fileable non-folder objects from the current folder tree.
  - `delete` **(default):** Delete all fileable objects.
- **boolean continueOnFailure:** If TRUE, then the repository SHOULD continue attempting to perform this operation even if deletion of a child- or descendant-object in the specified folder cannot be deleted.
  - If FALSE **(default)**, then the repository SHOULD abort this method when it fails to delete a single child- or descendant-object.

2.2.4.15.2 Outputs

- **<Array> ID** failedToDelete: A list of identifiers of objects in the folder tree that were not deleted.

2.2.4.15.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- `updateConflict`: See section 2.2.1.4.2 Specific Exceptions.

2.2.4.16 setContentStream

Description: Sets the content stream for the specified Document object.

Notes: A Repository MAY automatically create new Document versions as part of this service method. Therefore, the obejctId output NEED NOT be identical to the objectId input.

2.2.4.16.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **ID objectId:** The identifier for the Document object.
- **<contentStream> contentStream:** The Content Stream

Optional:

- **Boolean overwriteFlag:** If `TRUE` **(default)**, then the Repository MUST replace the existing content stream for the object (if any) with the input contentStream.

    - If `FALSE`, then the Repository MUST only set the input contentStream for the object if the object currently does not have a content-stream.
- **String changeToken:** See section 2.2.1.3 Change Tokens.

2.2.4.16.2 Outputs

- **ID objectId:** The ID of the document.
- **String changeToken:** See section 2.2.1.3 Change Tokens.

2.2.4.16.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- `contentAlreadyExists`**:** The Repository MUST throw this exception if the input parameter overwriteFlag is FALSE and the Object already has a content-stream.
- `storage`: See section 2.2.1.4.2 Specific Exceptions.
- `streamNotSupported`**:** The Repository MUST throw this exception if the ~~“~~"contentStreamAllowed~~”~~" attribute of the Object-Type definition specified by the cmis:objectTypeId property value of the given document is set to ~~“~~"notallowed~~”~~".
- `updateConflict`: See section 2.2.1.4.2 Specific Exceptions.
- `versioning`: The repository MAY throw this exception if the object is a non-current Document Version.

2.2.4.17 deleteContentStream

Description: Deletes the content stream for the specified Document object.

Notes: A Repository MAY automatically create new Document versions as part of this service method. Therefore, the objectId output NEED NOT be identical to the objectId input.

2.2.4.17.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **ID objectId:** The identifier for the Document object.

Optional:

- **String changeToken:** See section 2.2.1.3 Change Tokens.

2.2.4.17.2 Outputs

- **ID objectId:** The ID of the Document object.
- **String changeToken:** See section 2.2.1.3 Change Tokens.

2.2.4.17.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- `constraint`**:** The Repository MUST throw this exception if the Object~~’~~'s Object-Type definition ~~“~~"contentStreamAllowed~~”~~" attribute is set to ~~“~~"*required*~~”~~".
- `storage`: See section 2.2.1.4.2 Specific Exceptions.
- `updateConflict`: See section 2.2.1.4.2 Specific Exceptions.
- `versioning`: The repository MAY throw this exception if the object is a non-current Document Version.

2.2.5 Multi-filing Services

The Multi-filing services (*addObjectToFolder, removeObjectFromFolder)* are supported only if the repository supports the multifiling or unfiling optional capabilities. The Multi-filing Services are used to file/un-file objects into/from folders**.**

This service is NOT used to create or delete objects in the repository.

2.2.5.1 addObjectToFolder

Description: Adds an existing fileable non-folder object to a folder.

2.2.5.1.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **ID objectId:** The identifier of the object.
- **ID folderId:** The folder into which the object is to be filed.

Optional:

1. **Boolean allVersions:** Add all versions of the object to the folder if the repository supports version-specific filing. Defaults to TRUE.

2.2.5.1.2 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions.
- `constraint`**:** The Repository MUST throw this exception if the cmis:objectTypeId property value of the given object is NOT in the list of AllowedChildObjectTypeIds of the parent-folder specified by folderId.

2.2.5.2 removeObjectFromFolder

Description: Removes an existing fileable non-folder object from a folder.

2.2.5.2.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **ID objectId:** The identifier of the object.

Optional:

- **ID folderId:** The folder from which the object is to be removed.
  - If no value is specified, then the Repository MUST remove the object from all folders in which it is currently filed.

2.2.5.2.2 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions

2.2.6 Discovery Services

The Discovery Services (*query*) are used to search for query-able objects within the Repository.

2.2.6.1 query

Description: Executes a CMIS query statement against the contents of the Repository.

2.2.6.1.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **String statement:** CMIS query to be executed. (See section 2.1.10 Query.)

Optional:

- **Boolean searchAllVersions:**
  - If TRUE, then the Repository MUST include latest and non-latest versions of document objects in the query search scope.
  - If FALSE **(default)**, then the Repository MUST only include latest versions of documents in the query search scope.
  - If the Repository does not support the optional `capabilityAllVersionsSearchable` capability, then this parameter value MUST be set to FALSE.
- **Enum includeRelationships:** See section 2.2.1.2.2 Relationships.
  - Note: For query statements where the SELECT clause contains properties from only one virtual table reference (i.e. referenced object-type), any value for this enum may be used. If the SELECT clause contains properties from more than one table, then the value of this parameter MUST be ~~“~~"`none`~~″~~".
- **String renditionFilter:** See section 2.2.1.2.4 Renditions.
  - If the SELECT clause contains properties from more than one table, then the value of this parameter MUST not be set.
- **Boolean includeAllowableActions:** See section 2.2.1.2.6 Allowable Actions.
  - Note: For query statements where the SELECT clause contains properties from only one virtual table reference (i.e. referenced object-type), any value for this parameter may be used. If the SELECT clause contains properties from more than one table, then the value of this parameter MUST be ~~“~~"`FALSE`~~″~~".
- **Integer maxItems:** See section 2.2.1.1 Paging.
- **Integer skipCount:** See section 2.2.1.1 Paging.

2.2.6.1.2 Outputs

- **<Array> Object QueryResults:** The set of results for the query. (See section 2.1.10 Query.). Each object result MUST include the following elements if they are requested:
  - **<Array> Relationships:** See section 2.2.1.2.2 Relationships.
  - **<Array> Renditions:** See section 2.2.1.2.4 Renditions.
  - **AllowableActions:** See section 2.2.1.2.6 Allowable Actions.
- **Boolean hasMoreItems:** See section 2.2.1.1 Paging.

Optional:

- **Integer numItems:** See section 2.2.1.1 Paging.

2.2.6.1.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- If the select clause includes properties from more than a single type reference, then the repository SHOULD throw an exception if includeRelationships is something other than ~~“~~"none~~”~~" or includeAllowableActions is specified as TRUE.

2.2.6.2 getContentChanges

Description: Gets a list of content changes. This service is intended to be used by search crawlers or other applications that need to efficiently understand what has changed in the repository.

Notes:

- The content stream is NOT returned for any change event.
- The definition of the authority needed to call this service is repository specific.
- The latest change log token for a repository can be acquired via the getRepositoryInfo service.

2.2.6.2.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.

Optional:

- **String changeLogToken:**
    - If specified, then the Repository MUST return the change event corresponding to the value of the specified change log token as the first result in the output.
    - If not specified, then the Repository MUST return the first change event recorded in the change log.
- **Boolean includeProperties:**
    - If TRUE, then the Repository MUST include the updated property values for ~~“~~"updated~~”~~" change events if the repository supports returning property values as specified by capbilityChanges.
    - If FALSE (default), then the Repository MUST NOT include the updated property values for ~~“~~"updated~~”~~" change events. The single exception to this is that the objectId MUST always be included.
- **Boolean includePolicyIds:**

  If TRUE, then the Repository MUST include the IDs of Policies applied to the object referenced in each change event, if the change event modified the set of policies applied to the object.

  If FALSE (default), then the Repository will not include policy information.
- **String filter:** See section 2.2.1.2.1 Properties. The service will only return the properties in the matched object if they exist on the matched object type definition and in the filter.
- **Boolean includeACL:** See section 2.2.1.2.5 ACLs.
- **Integer maxItems:** See section 2.2.1.1 Paging.

2.2.6.2.2 Outputs

- **<Array> changeEvents:** A collection of CMIS objects that MUST include the information as specified in 2.1.11.3. Each result MUST include the following elements if they are requested:
    - **<Array> policyIDs:** The IDs of Policies applied to the object referenced in the change event.
    - **<Array> ACLs:** The ACLs applied to the object reference in the change event.
- **String latestChangeLogToken:** The change log token corresponding to the last change event in changeEvents.
- **Boolean hasMoreItems**: See section 2.2.1.1 Paging.

Optional:

- **Integer numItems:** See section 2.2.1.1 Paging.

2.2.6.2.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- `constraint`: The Repository MUST throw this exception if the event corresponding to the change log token provided as an input parameter is no longer available in the change log. (E.g. because the change log was truncated).

2.2.7 Versioning Services

The Versioning services (checkOut, cancelCheckOut, getPropertiesOfLatestVersion, getAllVersions, deleteAllVersions) are used to navigate or update a Document Version Series.

2.2.7.1 checkOut

Description: Create a private working copy of the document.

2.2.7.1.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **ID objectId:** The identifier of the document version.

2.2.7.1.2 Outputs

- ~~o~~● **ID objectId:** The identifier for the ~~“~~"Private Working Copy~~”~~" document.
- **Boolean contentCopied:** TRUE if the content-stream of the Private Working Copy is a copy of the contentStream of the Document that was checked out.
    - ~~o~~● FALSE if the content-stream of the Private Working Copy is ~~“~~"not set~~”~~".

2.2.7.1.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- `constraint`: The Repository MUST throw this exception if the Document~~’~~'s Object-Type definition~~’~~'s *versionable* attribute is FALSE.
- `storage`: See section 2.2.1.4.2 Specific Exceptions.
- `updateConflict`: See section 2.2.1.4.2 Specific Exceptions.
- `versioning`: The repository MAY throw this exception if the object is a non-current Document Version.

2.2.7.2 cancelCheckOut

Description: Reverses the effect of a check-out. Removes the private working copy of the checked-out document, allowing other documents in the version series to be checked out again. If the private working copy has been created by createDocument, cancelCheckOut MUST delete the created document.

2.2.7.2.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **ID objectId:** The identifier of the Private Working Copy.

2.2.7.2.2 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions

- constraint**:** The Repository MUST throw this exception if the Document~~’~~'s Object-Type definition~~’~~'s *versionable* attribute is FALSE.
- updateConflict: See section 2.2.1.4.2 Specific Exceptions.
- versioning: The repository MAY throw this exception if the object is a non-current Document Version.

2.2.7.3 checkIn

Description: Checks-in the Private Working Copy document.

Notes:

- For repositories that do NOT support the optional ~~“~~"capabilityPWCUpdatable~~”~~" capability, the *properties* and *contentStream* input parameters MUST be provided on the checkIn method for updates to happen as part of checkIn.
- Each CMIS protocol bindings MUST specify whether the checkin service MUST always include all updatable properties, or only those properties whose values are different than the original value of the object.

2.2.7.3.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **ID objectId:** The identifier of the document.

Optional:

- **Boolean major:** TRUE **(default)** if the checked-in Document Object MUST be a major version.
    - FALSE if the checked-in Document Object MUST NOT be a major version.
- **<Array> properties:** The property values that MUST be applied to the checked-in Document Object.
- **<contentStream> contentStream:** The Content Stream that MUST be stored for the checked-in Document Object. The method of passing the contentStream to the server and the encoding mechanism will be specified by each specific binding.
- **String checkinComment**: See section 2.1.9.5 Versioning Properties on Document Objects.
- **<Array> policies:** A list of policy IDs that MUST be applied to the newly-created Document object.
- **<Array> ACE addACEs:** A list of ACEs that MUST be added to the newly-created Document object.
- **<Array> ACE removeACEs:** A list of ACEs that MUST be removed from the newly-created Document object.

2.2.7.3.2 Outputs

ID objectId: The ID of the checked-in document.

2.2.7.3.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- constraint**:** The Repository MUST throw this exception if the Document~~’~~'s Object-Type definition~~’~~'s *versionable* attribute is FALSE.
- storage: See section 2.2.1.4.2 Specific Exceptions.
- streamNotSupported**:** The Repository MUST throw this exception if the ~~“~~"contentStreamAllowed~~”~~" attribute of the Object-Type definition specified by the

cmis:objectTypeId property value is set to ~~“~~"not allowed~~”~~" and a contentStream input parameter is provided.

- `updateConflict`: See section 2.2.1.4.2 Specific Exceptions.

2.2.7.4 getObjectOfLatestVersion

Description: Get a the latest Document object in the Version Series.

2.2.7.4.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **ID objectId:** The identifier for the Version Series.

Optional:

- **Boolean major:** If TRUE, then the Repository MUST returnthe properties for the latest major version object in the Version Series.
  - If FALSE **(default)**, the Repository MUST return the properties for the latest (major or non-major) version object in the Version Series.
- **String filter:** See section 2.2.1.2.1 Properties.
- **Enum includeRelationships:** See section 2.2.1.2.2 Relationships.
- **Boolean includePolicyIds:** See section 2.2.1.2.3 Policies.
- **String renditionFilter:** See section 2.2.1.2.4 Renditions.
- **Boolean includeACL:** See section 2.2.1.2.5 ACLs.
- **Boolean includeAllowableActions:** See section 2.2.1.2.6 Allowable Actions.

2.2.7.4.2 Outputs

- **<Array> Properties:** The list of properties for the object.
- **<Array> Relationships:** See section 2.2.1.2.2 Relationships.
- **<Array> Policy Ids:** See section 2.2.1.2.3 Policies.
- **<Array> Renditions:** See section 2.2.1.2.4 Renditions.
- **<Array> ACLs:** See section 2.2.1.2.5 ACLs.
- **AllowableActions:** See section 2.2.1.2.6 Allowable Actions.

2.2.7.4.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- `filterNotValid`**:** The Repository MUST throw this exception if the~~is~~ property or rendition filter input parameter is not valid.
- `objectNotFound`: The Repository MUST throw this exception if the input parameter major is TRUE and the Version Series contains no major versions.

2.2.7.5 getPropertiesOfLatestVersion

Description: Get a subset of the properties for the latest Document Object in the Version Series.

2.2.7.5.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.

- **ID objectId:** The identifier for the Version Series.

Optional:

- **Boolean major:** If TRUE, then the Repository MUST return the properties for the latest major version object in the Version Series.
  - If FALSE **(default)**, the Repository MUST return the properties for the latest (major or non-major) version object in the Version Series.
- **String filter:** See section 2.2.1.2.1 Properties.

2.2.7.5.2 Outputs

<Array> Properties: The list of properties for the object.

2.2.7.5.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- `filterNotValid`**:** The Repository MUST throw this exception if this property filter input parameter is not valid.
- `objectNotFound`: The Repository MUST throw this exception if the input parameter major is TRUE and the Version Series contains no major versions.

2.2.7.6 getAllVersions

Description: Returns the list of all Document Objects in the specified Version Series, sorted by cmis:creationDate descending.

Notes:

- The result set for this operation MUST include the Private Working Copy, subject to caller's access privileges.

2.2.7.6.1 Inputs

Required:

- ~~o~~ **ID repositoryId:** The identifier for the Repository.
- ~~o~~ **ID objectId:** The identifier for the Version Series.

Optional:

- **String filter:** See section 2.2.1.2.1 Properties.
- **Boolean includeAllowableActions:** See section 2.2.1.2.6 Allowable Actions.

2.2.7.6.2 Outputs

- **<Array> ObjectResults:** A list of Document Objects in the specified Version Series. Each object result MUST include the following elements if they are requested:
  - **<Array> Properties:** The list of properties for the object.
  - **AllowableActions:** See section 2.2.1.2.6 Allowable Actions.

2.2.7.6.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- `filterNotValid`**:** The Repository MUST throw this exception if this property filter input parameter is not valid.

2.2.8 Relationship Services

The Relationship Services (*getObjectRelationships*) are used to retrieve the dependent Relationship objects associated with an independent object.

2.2.8.1 getObjectRelationships

Description: Gets all or a subset of relationships associated with an independent object.

2.2.8.1.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **ID objectId:** The identifier of the object.

Optional:

- **Boolean includeSubRelationshipTypes:** If TRUE, then the Repository MUST return all relationships whose Object-Types are descendant-types of the given object~~’~~'s cmis:objectTypeId property value as well as relationships of the specified type.
    - Default is FALSE
    - If FALSE, then the Repository MUST only return relationships whose Object-Type is equivalent to the given object~~’~~'s cmis:objectTypeId property value.
- **Enum** `relationshipDirection`: An enumeration specifying whether the Repository MUST return relationships where the specified Object is the source of the relationship, the target of the relationship, or both. Valid values are:
    - `source`**: (default)** The Repository MUST return only relationship objects where the specified object is the source object.
    - `target`**:** The Repository MUST return only relationship objects where the specified object is the target object.
    - `either`**:** The Repository MUST return relationship objects where the specified object is either the source or the target object.
- **ID typeId:** If specified, then the Repository MUST return only relationships whose Object-Type is of the type specified
    - If not specified, then the repository MUST return Relationship objects of all types.
- **Integer maxItems:** See section 2.2.1.1 Paging.
- **Integer skipCount:** See section 2.2.1.1 Paging.
- **String filter:** See section 2.2.1.2.1 Properties.
- **Boolean includeAllowableActions:** See section 2.2.1.2.6 Allowable Actions.

2.2.8.1.2 Outputs

- **<Array> Objects:** A list of the relationship objects. Each object result MUST include the following elements if they are requested:
    - **<Array> Properties:** The list of properties for the object.
    - **AllowableActions:** See section 2.2.1.2.6 Allowable Actions.
- **Boolean hasMoreItems:** See section 2.2.1.1 Paging.

Optional:

- **Integer numItems:** See section 2.2.1.1 Paging.

2.2.8.1.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- `filterNotValid`**:** The Repository MUST throw this exception if this property filter input parameter is not valid.

2.2.9 Policy Services

The Policy Services *(applyPolicy, removePolicy, getAppliedPolicies)* are used to apply or remove a policy object to a controllablePolicy object.

2.2.9.1 applyPolicy

Description: Applies a specified policy to an object.

2.2.9.1.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **ID policyId:** The identifier for the Policy to be applied.
- **ID objectId:** The identifier of the object.

2.2.9.1.2 Exceptions Thrown & Conditions

See section 2.2.1.4.1 General Exceptions

`constraint` **:** The Repository MUST throw this exception if the specified object's Object-Type definition's attribute for *controllablePolicy* is FALSE.

2.2.9.2 removePolicy

Description: Removes a specified policy from an object.

2.2.9.2.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **ID policyId:** The identifier for the Policy to be removed.
- **ID objectId:** The identifier of the object.

2.2.9.2.2 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- `constraint`**:** The Repository MUST throw this exception if the specified object's Object-Type definition's attribute for *controllablePolicy* is FALSE.

2.2.9.3 getAppliedPolicies

Description: Gets the list of policies currently applied to the specified object.

2.2.9.3.1 Inputs

Required:

- **ID repositoryId:** The identifier for the Repository.
- **ID objectId:** The identifier of the object.

Optional:

String filter: See section 2.2.1.2.1 Properties.

2.2.9.3.2 Outputs

<Array> Objects: A list of Policy Objects.

2.2.9.3.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- `filterNotValid`**:** The Repository MUST throw this exception if this property filter input parameter is not valid.

2.2.10 ACL Services

2.2.10.1 getACL

Description: Get the ACL currently applied to the specified document or folder object.

2.2.10.1.1 Inputs

Required:

- **ID repositoryId:** The identifier for the repository.
- **ID objectId:** The identifier for the object

Optional:

- **Boolean onlyBasicPermissions:** See section 2.8 Access Control. The repository SHOULD make a best effort to fully express the native security applied to the object
  - `TRUE:` (default value if not provided) indicates that the client requests that the returned ACL be expressed using only the CMIS Basic permissions.
  - `FALSE`**:** indicates that the server may respond using either solely CMIS Basic permissions, or repository specific permissions or some combination of both.

2.2.10.1.2 Outputs

- **<Array> AccessControlEntryType:** The list of access control entries of the ACL for the object.

Optional:

- **Boolean exact:** An indicator that the ACL returned fully describes the permission for this object – i.e. there are no other security constraints applied to this object. Not provided defaults to FALSE.

2.2.10.1.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions

2.2.10.1.4 Notes

This service MUST be supported by a repository, if *getRepository* returns *capabilityACL=discover* or *=manage*.

How an ACL for the object is computed is up to the repository. A client MUST NOT assume that the ACEs from the ACL as returned by this service can be applied via *applyACL*.

2.2.10.2 applyACL

Description: Adds or removes the given ACEs to or from the ACL of document or folder object.

2.2.10.2.1 Inputs

Required:

- **ID repositoryId:** The identifier for the repository.
- **ID objectId:** The identifier for the object

Optional:

- **<Array> AccessControlEntryType addACEs:** The ACEs to be added.
- **<Array> AccessControlEntryType removeACEs:** The ACEs to be removed.
- **Enum ACLPropagation:** Specifies how ACEs should be handled:
    - `objectonly`: ACEs must be applied without changing the ACLs of other objects.
    - `propagate`: ACEs must be applied by propagate the changes to all “"inheriting”" objects.
  - `repositorydetermined`: **Default value. I**ndicates that the client leaves the behavior to the repository.

2.2.10.2.2 Outputs

- **<Array> AccessControlEntryType:** The list of access control entries of the resulting ACL for the object

Optional:

- **Boolean exact:** An indicator that the ACL returned fully describes the permission for this object – i.e. there are no other security constraints applied to this object. Not provided defaults to FALSE.

~~•String changeToken: See section 2.2.1.3 Change Tokens.~~

2.2.10.2.3 Exceptions Thrown & Conditions

- See section 2.2.1.4.1 General Exceptions
- `constraint`: The Repository MUST throw this exception if ANY of the following conditions are met:
    - The specified object’'s Object-Type definition’'s attribute for *controllableACL* is FALSE.
    - The value for *ACLPropagation* does not match the values as returned via *getACLCapabilities*.
    - At least one of the specified values for *permission* in ANY of the *ACEs does not match* ANY of the *permissionNames* as returned by *getACLCapability and is not a CMIS Basic permission*

2.2.10.2.4 Notes

This service MUST be supported by a repository, if *getRepository* returns *capabilityACL=manage*.

How ACEs are added or removed to or from the object is up to the repository – with respect to the *ACLPropagation* provided by the client. For “"shared”" ACEs (e.g. via inheritance), the repository MAY merge the ACEs provided with the ACEs of the ACL already applied to the object (i.e. the ACEs provided MAY not be completely added or removed from the effective ACL for the object).

3 Restful AtomPub Binding

3.1 Overview

This binding is based upon the Atom (RFC4287) and Atom Publishing Protocol (RFC5023). Implementations of CMIS MUST be compliant with RFC4287 and RFC5023.

In this binding, the client interacts with the repository by acquiring the service document. The client will request the service document by the URI provided by the vendor. The client will then choose a CMIS collection, and then start accessing the repository by following the references in the returned documents.

This binding consists of a service document specifying at least CMIS service collections, atom collections, feeds and entry documents. CMIS extends the Atom and AtomPub documents utilizing the Atom and AtomPub extension mechanism. CMIS also leverages link tags to specify additional resources related to the requested resource.

When requesting a resource, optional parameters may be specified to change default behavior via query parameters.

3.1.1 Namespaces

This specification uses the following namespaces and prefixes when referring to xml or xml schema elements in the text or examples:

- CMIS-Core: http://docs.oasis-open.org/ns/cmis/core/200908/
    - Prefix: cmis
- CMIS-RestAtom: http://docs.oasis-open.org/ns/cmis/restatom/200908/
    - Prefix: cmisra
- Atom : http://www.w3.org/2005/Atom
    - Prefix: atom
- AtomPub: http://www.w3.org/2007/app
    - Prefix: app

3.1.2 Authentication

Authentication SHOULD be handled by the transport protocol. Please see AtomPub (RFC5023) section 14.

3.1.3 Response Formats

The client can specify, in HTTP the Accept header, which formats are acceptable to the client. With this mechanism the client can chose which response format the CMIS implementation should respond with. The CMIS compliant implementation MUST support the appropriate Media Types specified in this document.

3.1.4 Optional Arguments

The binding supports adding optional parameters to CMIS resources to modify the default behavior. CMIS implementations MUST support arguments being specified as HTTP query string parameters.

Names and valid values for HTTP query string parameters are as described in the appropriate CMIS Service descriptions [see CMIS Domain Model]. Valid values of enumeration types are also represented in the CMIS Core XML Schema

3.1.5 Errors and Exceptions

Exceptions MUST be mapped to the appropriate HTTP status code.

Repositories SHOULD provide sufficient information in the body of the HTTP response for a user to determine corrective action.

See Section 3.2.4 HTTP Status Codes for more information.

3.1.6 Renditions

Each Rendition included in a CMIS AtomPub response is represented as an Atom link with relationship alternate.

The following attributes SHOULD be included on the link element:

- href: URI to the rendition content stream
- type: The Media Type of the Rendition
- cmisra:renditionKind: The Rendition Kind for the Rendition

The following attributes MAY be included

- title: The Filename (or name property if object) of Rendition
- length: The length of the rendition

3.1.7 Content Streams

The content stream for a document SHOULD be referenced by the content src attribute as well as the edit-media link relation.

A CMIS Repository MAY use different URIs for both content src attribute and the edit-media link relation for the same content stream.

The following attributes SHOULD be included on the link element:

- href: URI to the content stream
- type: The Media Type of the content stream

3.1.8 Paging of Feeds

For paging, please see the AtomPub RFC. CMIS leverages first, next, previous, and last link relations to express paging.

If the repository can include the number of items (numItems in CMIS Domain Model) in a feed, then the repository SHOULD include the cmisra:numItems extension element in the feed.

3.1.9 Services not Exposed

The following services are not exposed in this binding:

- getRenditions: This is exposed as part of getObject
- getProperties: This is exposed as part of getObject

- createDocumentFromSource: This is not exposed in this binding except as the client saving the resource and resubmitting it without the cmis:objectId.
- Setting ACL on Create or Checkin operations
    - This is currently not possible with the REST binding. The Create or Checkin operation must be performed first. Then the dependent resource, ACL, must be retrieved and updated.
- setContentStream: This does not return the new object id and change token as specified by the domain model. This is not possible without introducing a new HTTP header.
- deleteContentStream: This does not return the new object id and change token as specified by the domain model. This is not possible without introducing a new HTTP header.
- checkOut: This does not return whether or not content was copied. This is not possible without introducing a new HTTP header.

3.1.9.1 removePolicy

This service is exposed from the domain model in the RESTful Atom Binding. However, it is not as straightforward. To remove a policy from an object, one must do:

– Get the object.

– Fetch the policies collection of the object.

– Walk through the feed and find the policy object where cmis:objectId == policy id to remove.

– Get the self lin of this policy object.

– Perform a DELETE on this URL.

This is also the only case in the RESTful Atom Binding where an URI in a collection (policies) is specific to that collection.

3.2 HTTP

3.2.1 Entity Tag

CMIS changeTokens are represented as Entity Tags and follow HTTP~~'~~'s use of Entity Tags. CMIS server implementations SHOULD support Entity Tags. ChangeTokens are also provided as properties and SHOULD be provided when the object is included inside an atom entry or feed.

On updates, perform the following checks (HTTP & CMIS levels):

1. If If-Match header is sent by client, ETag value is pulled from HTTP header If-Match per RFC2616. The supplied ETag is compared against the ETag on the server. If the match fails, then status code 412 is used.
2. If cmis:changeToken property is supplied by the client, compare the supplied and the cmis:changeToken on the server. If the comparison fails, then return status code 409 per CMIS.

~~1.~~3. If ETag and cmis:changeToken are both specified, the HTTP If-Match check should be performed first.

3.2.2 HTTP Range

Repositories MAY support HTTP Range requests on Content Streams.

3.2.3 HTTP OPTIONS Method

The repository MAY support the HTTP OPTIONS method on all the resources defined in this specification. If the repository supports OPTIONS, then the repository MUST at least return the HTTP methods specified for that resource in the Allow header.

3.2.4 HTTP Status Codes

Please see the HTTP specification for more information on the HTTP status codes. These are provided as guidance from the HTTP specification. If any conflict arises, the HTTP specification is authoritative.

3.2.4.1 General CMIS Exceptions

The following listing defines the HTTP status codes that repositories MUST return for the various common exceptions defined in CMIS Domain Model.

CMIS Services Exception	HTTP Status Code
invalidArgument	400
objectNotFound	404
permissionDenied	403
notSupported	405
runtime	500
constraint	409
filterNotValid	400
streamNotSupported	403
storage	500
contentAlreadyExists	409
versioning	409
updateConflict	409
nameConstraintViolation	409

3.2.4.2 Notable HTTP Status Codes

- 415 Unsupported Media Type
    - When a document is POST~~’~~'ed to a collection that does not support the media type of the document, this status code MUST be returned
- 422 Unprocessable Entity (Defined in RFC4918 Section 11.2)
    - When a request has been POST~~’~~'ed but cannot be processed, this status code MUST be returned

Please see RFC2616 Section 10 for more information.

3.3 Media Types

CMIS introduces new media types for:

- a CMIS Query document (application/cmisquery+xml)
- a CMIS AllowableActions document (application/cmisallowableactions+xml)
- an Atom Document (Entry or Feed) with any CMIS Markup (application/cmisatom+xml)

- an Atom Feed Document with CMIS Hierarchy extensions (application/cmistree+xml)
- a CMIS ACL Document (application/cmisacl+xml)

In addition to those media types specified by CMIS, CMIS also leverages these media types:

- AtomPub Service (application/atomsvc+xml)
- Atom Entry (application/atom+xml;type=entry)
- Atom Feed (application/atom+xml;type=feed)

3.3.1 CMIS Atom

Media Type: application/cmisatom+xml

Starting tag: atom:feed or atom:entry

Type Parameters:

- type – the semantics of the type parameter MUST be the same as the media type parameter for atom documents.

This allows clients to differentiate between repositories that require atom media type with CMIS extensions (application/cmisatom+xml) for creation and repositories that allow generic atom media type without CMIS extensions (application/atom+xml).

This is only used for CMIS repositories to advertise what media types are accepted for adding to a collection (e.g., creating resources in a collection). As such CMIS does not require specifying whether an atom feed has CMIS markup. It is included to be consistent with the Atom media type.

All feeds and entries from a CMIS repository MUST utilize the atom media type for exposing Atom resources. Please see the individual resources for more information on the media type. This provides the interoperability with Atom clients.

Example:

```
<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<atom:entry xmlns:cmis=""http://docs.oasis-open.org/ns/cmis/core/200908/""
xmlns:cmism=""http://docs.oasis-open.org/ns/cmis/messaging/200908/""
xmlns:atom=""http://www.w3.org/2005/Atom""
xmlns:app=""http://www.w3.org/2007/app"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:author>
        <atom:name>Al Brown</atom:name>
    </atom:author>
    <atom:id>urn:uuid:efe0542e-8933-4b3e-93f2-4d1caa3fc2d9</atom:id>
    <atom:title type=""text"">CMIS Example Document</atom:title>
    <atom:updated>2010-01-25T10:20:58.318-08:00</atom:updated>
    <atom:content type=""text"">some text</atom:content>
    <cmisra:object>
        <cmis:properties>
            <cmis:propertyId localName=""rep-cmis:objectTypeId""
propertyDefinitionId=""cmis:objectTypeId"">
                <cmis:value>invoice</cmis:value>
            </cmis:propertyId>
            <cmis:propertyString localName=""rep-cmis:name""
propertyDefinitionId=""cmis:name"">
                <cmis:value>CMIS Example Document</cmis:value>
            </cmis:propertyString>
        </cmis:properties>
    </cmisra:object>
</atom:entry>

```

3.3.2 CMIS Query

Media Type: application/cmisquery+xml

Starting tag: cmis:query

This document contains the representation of a query to be executed in a CMIS repository.

Example:

```
<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<cmis:query xmlns:cmis=""http://docs.oasis-open.org/ns/cmis/core/200908/""
xmlns:cmism=""http://docs.oasis-open.org/ns/cmis/messaging/200908/""
xmlns:atom=""http://www.w3.org/2005/Atom""
xmlns:app=""http://www.w3.org/2007/app"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <cmis:statement>SELECT * FROM cmis:document</cmis:statement>
    <cmis:searchAllVersions>true</cmis:searchAllVersions>
    <cmis:includeAllowableActions>false</cmis:includeAllowableActions>
    <cmis:includeRelationships>none</cmis:includeRelationships>
    <cmis:renditionFilter>*</cmis:renditionFilter>
    <cmis:maxItems>50</cmis:maxItems>
    <cmis:skipCount>0</cmis:skipCount>
</cmis:query>
```

Please also see the example documents included with the schema.

3.3.3 CMIS Allowable Actions

Media Type: application/cmisallowableactions+xml

Starting tag: cmis:allowableActions

This document contains the representation of the allowable actions the user may perform on the referenced object.

Example:

```
<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<cmis:allowableActions xmlns:cmis=""http://docs.oasis-
open.org/ns/cmis/core/200908/"" xmlns:cmism=""http://docs.oasis-
open.org/ns/cmis/messaging/200908/""
xmlns:atom=""http://www.w3.org/2005/Atom""
xmlns:app=""http://www.w3.org/2007/app"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <cmis:canDeleteObject>true</cmis:canDeleteObject>
    <cmis:canUpdateProperties>true</cmis:canUpdateProperties>
    <cmis:canGetProperties>true</cmis:canGetProperties>
    <cmis:canGetObjectRelationships>true</cmis:canGetObjectRelationships>
    <cmis:canGetObjectParents>true</cmis:canGetObjectParents>
    <cmis:canMoveObject>true</cmis:canMoveObject>
    <cmis:canDeleteContentStream>true</cmis:canDeleteContentStream>
    <cmis:canCheckOut>true</cmis:canCheckOut>
    <cmis:canCancelCheckOut>true</cmis:canCancelCheckOut>
    <cmis:canCheckIn>true</cmis:canCheckIn>
    <cmis:canSetContentStream>true</cmis:canSetContentStream>
    <cmis:canGetAllVersions>true</cmis:canGetAllVersions>
    <cmis:canAddObjectToFolder>true</cmis:canAddObjectToFolder>
    <cmis:canRemoveObjectFromFolder>true</cmis:canRemoveObjectFromFolder>
    <cmis:canGetContentStream>true</cmis:canGetContentStream>
    <cmis:canApplyPolicy>true</cmis:canApplyPolicy>
    <cmis:canGetAppliedPolicies>true</cmis:canGetAppliedPolicies>
    <cmis:canRemovePolicy>true</cmis:canRemovePolicy>
    <cmis:canCreateDocument>true</cmis:canCreateDocument>
</cmis:allowableActions>
```

Please also see the example documents included with the schema.

3.3.4 CMIS Tree

Media Type: application/cmistree+xml

Starting tag: atom:feed

This document is an atom feed (application/atom+xml;type=feed) with CMIS markup to nest a hierarchy.

Please see Section 3.5.2.1 for more information.

Example:

```
<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<atom:feed xmlns:cmis=""http://docs.oasis-open.org/ns/cmis/core/200908/""
xmlns:cmism=""http://docs.oasis-open.org/ns/cmis/messaging/200908/""
xmlns:atom=""http://www.w3.org/2005/Atom""
xmlns:app=""http://www.w3.org/2007/app"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:title type=""text"">Feed for folder1</atom:title>
    <atom:author>
        <atom:name>Al Brown</atom:name>
        <atom:uri>http://www.ibm.com/</atom:uri>
        <atom:email>albertcbrown@us.ibm.com</atom:email>
    </atom:author>
    <atom:updated>2010-01-25T10:20:58.536-08:00</atom:updated>
    <atom:id>urn:uuid:4a80905c-f774-4a9e-a57d-bf0dae5a796e</atom:id>
    <atom:link type=""application/atom+xml;type=feed"" rel=""self""
href=""http://cmisexample.oasis-open.org/rep1/cf3c076e-36e9-4ace-8fed-
41e0d92dfc71/3""/>
    <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
    <atom:link type=""application/atom+xml;type=entry"" rel=""via""
href=""http://cmisexample.oasis-open.org/rep1/cf3c076e-36e9-4ace-8fed-
41e0d92dfc71""/>
    <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/foldertree""
href=""http://cmisexample.oasis-open.org/rep1/cf3c076e-36e9-4ace-8fed-
41e0d92dfc71/foldertree""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""down""
href=""http://cmisexample.oasis-open.org/rep1/cf3c076e-36e9-4ace-8fed-
41e0d92dfc71/children""/>
    <atom:link type=""application/atom+xml;type=entry"" rel=""up""
href=""http://cmisexample.oasis-open.org/rep1/bb11830c-7d1e-4b0f-9ff2-
af4857c49200""/>
    <atom:entry>
```

```
        <atom:author>
            <atom:name>Al Brown</atom:name>
            <atom:uri>http://www.ibm.com/</atom:uri>
            <atom:email>albertcbrown@us.ibm.com</atom:email>
        </atom:author>
        <atom:content src=""http://cmisexample.oasis-open.org/rep1/63a9c18c-
5e31-4590-8462-86d181e345a4""/>
        <atom:id>urn:uuid:63a9c18c-5e31-4590-8462-86d181e345a4</atom:id>
        <atom:title type=""text"">CMIS Example Folder as Customer
type</atom:title>
        <atom:updated>2010-01-25T10:20:58.536-08:00</atom:updated>
        <atom:link rel=""self"" href=""http://cmisexample.oasis-
open.org/rep1/63a9c18c-5e31-4590-8462-86d181e345a4""/>
        <atom:link rel=""edit"" href=""http://cmisexample.oasis-
open.org/rep1/63a9c18c-5e31-4590-8462-86d181e345a4""/>
        <atom:link type=""application/cmis+xml;type=allowableActions""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/allowableactions""
href=""http://cmisexample.oasis-open.org/rep1/63a9c18c-5e31-4590-8462-
86d181e345a4/allowableactions""/>
        <atom:link type=""application/atom+xml;type=entry""
rel=""describedby"" href=""http://cmisexample.oasis-open.org/rep1/63a9c18c-
5e31-4590-8462-86d181e345a4/type""/>
        <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
        <atom:published>2010-01-25T10:20:58.536-08:00</atom:published>
        <atom:summary type=""html"">HTML summary of Entry  63a9c18c-5e31-4590-
8462-86d181e345a4</atom:summary>
        <atom:link type=""application/atom+xml;type=entry"" rel=""up""
href=""http://cmisexample.oasis-open.org/rep1/63a9c18c-5e31-4590-8462-
86d181e345a4/up""/>
        <atom:link type=""application/atom+xml;type=feed"" rel=""down""
href=""http://cmisexample.oasis-open.org/rep1/63a9c18c-5e31-4590-8462-
86d181e345a4/children""/>
        <atom:link type=""application/cmistree+xml"" rel=""down""
href=""http://cmisexample.oasis-open.org/rep1/63a9c18c-5e31-4590-8462-
86d181e345a4/tree""/>
        <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/foldertree""
href=""http://cmisexample.oasis-open.org/rep1/63a9c18c-5e31-4590-8462-
86d181e345a4/foldertree""/>
        <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/relationships""
href=""http://cmisexample.oasis-open.org/rep1/63a9c18c-5e31-4590-8462-
86d181e345a4/relationships""/>
        <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/policies""
href=""http://cmisexample.oasis-open.org/rep1/63a9c18c-5e31-4590-8462-
86d181e345a4/policies""/>
        <atom:link type=""application/cmisacl+xml"" rel=""http://docs.oasis-
open.org/ns/cmis/link/200908/acl"" href=""http://cmisexample.oasis-
open.org/rep1/63a9c18c-5e31-4590-8462-86d181e345a4/acl""/>
        <cmisra:object>
            <cmis:properties>
                <cmis:propertyId localName=""rep-cmis:objectId""
propertyDefinitionId=""cmis:objectId"">
                    <cmis:value>63a9c18c-5e31-4590-8462-
86d181e345a4</cmis:value>
                </cmis:propertyId>
            </cmis:properties>
        </cmisra:object>
        <cmisra:pathSegment>customer</cmisra:pathSegment>
        <cmisra:children>
            <atom:feed>
```

```
                <atom:title type=""text"">CMIS Example Folder as Customer
type</atom:title>
                <atom:author>
                    <atom:name>Al Brown</atom:name>
                    <atom:uri>http://www.ibm.com/</atom:uri>
                    <atom:email>albertcbrown@us.ibm.com</atom:email>
                </atom:author>
                <atom:updated>2010-01-25T10:20:58.536-08:00</atom:updated>
                <atom:id>urn:uuid:51b5c0cd-e473-4492-82b3-
666fbf913cf0</atom:id>
                <atom:link type=""application/atom+xml;type=feed""
rel=""self"" href=""http://cmisexample.oasis-open.org/rep1/63a9c18c-5e31-4590-
8462-86d181e345a4/3""/>
                <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
                <atom:link type=""application/atom+xml;type=entry""
rel=""via"" href=""http://cmisexample.oasis-open.org/rep1/63a9c18c-5e31-4590-
8462-86d181e345a4""/>
                <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/foldertree""
href=""http://cmisexample.oasis-open.org/rep1/63a9c18c-5e31-4590-8462-
86d181e345a4/foldertree""/>
                <atom:link type=""application/atom+xml;type=feed""
rel=""down"" href=""http://cmisexample.oasis-open.org/rep1/63a9c18c-5e31-4590-
8462-86d181e345a4/children""/>
                <atom:link type=""application/atom+xml;type=entry"" rel=""up""
href=""http://cmisexample.oasis-open.org/rep1/cf3c076e-36e9-4ace-8fed-
41e0d92dfc71""/>
                <atom:entry>
                    <atom:author>
                        <atom:name>Al Brown</atom:name>
                        <atom:uri>http://www.ibm.com/</atom:uri>
                        <atom:email>albertcbrown@us.ibm.com</atom:email>
                    </atom:author>
                    <atom:content src=""http://cmisexample.oasis-
open.org/rep1/20cb7e68-0a7e-46ea-87e0-09fb8d85286e""/>
                    <atom:id>urn:uuid:20cb7e68-0a7e-46ea-87e0-
09fb8d85286e</atom:id>
                    <atom:title type=""text"">CMIS Example Doc as Invoice
type</atom:title>
                    <atom:updated>2010-01-25T10:20:58.536-08:00</atom:updated>
                    <atom:link rel=""self"" href=""http://cmisexample.oasis-
open.org/rep1/20cb7e68-0a7e-46ea-87e0-09fb8d85286e""/>
                    <atom:link rel=""edit"" href=""http://cmisexample.oasis-
open.org/rep1/20cb7e68-0a7e-46ea-87e0-09fb8d85286e""/>
                    <atom:link
type=""application/cmis+xml;type=allowableActions"" rel=""http://docs.oasis-
open.org/ns/cmis/link/200908/allowableactions""
href=""http://cmisexample.oasis-open.org/rep1/20cb7e68-0a7e-46ea-87e0-
09fb8d85286e/allowableactions""/>
                    <atom:link type=""application/atom+xml;type=entry""
rel=""describedby"" href=""http://cmisexample.oasis-open.org/rep1/20cb7e68-
0a7e-46ea-87e0-09fb8d85286e/type""/>
                    <atom:link type=""application/atomsvc+xml""
rel=""service"" href=""http://cmisexample.oasis-open.org/rep1//service""/>
                    <atom:published>2010-01-25T10:20:58.536-
08:00</atom:published>
                    <atom:summary type=""html"">HTML summary of Entry
20cb7e68-0a7e-46ea-87e0-09fb8d85286e</atom:summary>
                    <atom:link rel=""edit-media""
href=""http://cmisexample.oasis-open.org/rep1/20cb7e68-0a7e-46ea-87e0-
09fb8d85286e/edit-media""/>
```

```
                    <atom:link rel=""alternate""
href=""http://cmisexample.oasis-open.org/rep1/20cb7e68-0a7e-46ea-87e0-
09fb8d85286e/alternate""/>
                    <atom:link type=""application/atom+xml;type=feed""
rel=""up"" href=""http://cmisexample.oasis-open.org/rep1/20cb7e68-0a7e-46ea-
87e0-09fb8d85286e/parents""/>
                    <atom:link type=""application/atom+xml;type=feed""
rel=""version-history"" href=""http://cmisexample.oasis-
open.org/rep1/20cb7e68-0a7e-46ea-87e0-09fb8d85286e/allversions""/>
                    <atom:link type=""application/atom+xml;type=entry""
rel=""current-version"" href=""http://cmisexample.oasis-
open.org/rep1/20cb7e68-0a7e-46ea-87e0-09fb8d85286e/latest""/>
                    <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/relationships""
href=""http://cmisexample.oasis-open.org/rep1/20cb7e68-0a7e-46ea-87e0-
09fb8d85286e/relationships""/>
                    <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/policies""
href=""http://cmisexample.oasis-open.org/rep1/20cb7e68-0a7e-46ea-87e0-
09fb8d85286e/policies""/>
                    <atom:link type=""application/cmisacl+xml""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/acl""
href=""http://cmisexample.oasis-open.org/rep1/20cb7e68-0a7e-46ea-87e0-
09fb8d85286e/acl""/>
                    <cmisra:object>
                        <cmis:properties>
                            <cmis:propertyId localName=""rep-cmis:objectId""
propertyDefinitionId=""cmis:objectId"">
<cmis:value>20cb7e68-0a7e-46ea-87e0-09fb8d85286e</cmis:value>
                            </cmis:propertyId>
                        </cmis:properties>
                    </cmisra:object>
                    <cmisra:pathSegment>invoice1.pdf</cmisra:pathSegment>
                </atom:entry>
            </atom:feed>
        </cmisra:children>
    </atom:entry>
    <atom:entry>
        <atom:author>
            <atom:name>Al Brown</atom:name>
            <atom:uri>http://www.ibm.com/</atom:uri>
            <atom:email>albertcbrown@us.ibm.com</atom:email>
        </atom:author>
        <atom:content src=""http://cmisexample.oasis-open.org/rep1/1de1d476-
11fb-47bf-b136-8a8d0b4b030a""/>
        <atom:id>urn:uuid:1de1d476-11fb-47bf-b136-8a8d0b4b030a</atom:id>
        <atom:title type=""text"">CMIS Example Doc as Invoice
type</atom:title>
        <atom:updated>2010-01-25T10:20:58.568-08:00</atom:updated>
        <atom:link rel=""self"" href=""http://cmisexample.oasis-
open.org/rep1/1de1d476-11fb-47bf-b136-8a8d0b4b030a""/>
        <atom:link rel=""edit"" href=""http://cmisexample.oasis-
open.org/rep1/1de1d476-11fb-47bf-b136-8a8d0b4b030a""/>
        <atom:link type=""application/cmis+xml;type=allowableActions""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/allowableactions""
href=""http://cmisexample.oasis-open.org/rep1/1de1d476-11fb-47bf-b136-
8a8d0b4b030a/allowableactions""/>
        <atom:link type=""application/atom+xml;type=entry""
rel=""describedby"" href=""http://cmisexample.oasis-open.org/rep1/1de1d476-
11fb-47bf-b136-8a8d0b4b030a/type""/>
        <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
        <atom:published>2010-01-25T10:20:58.568-08:00</atom:published>
        <atom:summary type=""html"">HTML summary of Entry  1de1d476-11fb-47bf-
b136-8a8d0b4b030a</atom:summary>
        <atom:link rel=""edit-media"" href=""http://cmisexample.oasis-
open.org/rep1/1de1d476-11fb-47bf-b136-8a8d0b4b030a/edit-media""/>
        <atom:link rel=""alternate"" href=""http://cmisexample.oasis-
open.org/rep1/1de1d476-11fb-47bf-b136-8a8d0b4b030a/alternate""/>
        <atom:link type=""application/atom+xml;type=feed"" rel=""up""
href=""http://cmisexample.oasis-open.org/rep1/1de1d476-11fb-47bf-b136-
8a8d0b4b030a/parents""/>
        <atom:link type=""application/atom+xml;type=feed"" rel=""version-
history"" href=""http://cmisexample.oasis-open.org/rep1/1de1d476-11fb-47bf-
b136-8a8d0b4b030a/allversions""/>
        <atom:link type=""application/atom+xml;type=entry"" rel=""current-
version"" href=""http://cmisexample.oasis-open.org/rep1/1de1d476-11fb-47bf-
b136-8a8d0b4b030a/latest""/>
        <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/relationships""
href=""http://cmisexample.oasis-open.org/rep1/1de1d476-11fb-47bf-b136-
8a8d0b4b030a/relationships""/>
        <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/policies""
href=""http://cmisexample.oasis-open.org/rep1/1de1d476-11fb-47bf-b136-
8a8d0b4b030a/policies""/>
        <atom:link type=""application/cmisacl+xml"" rel=""http://docs.oasis-
open.org/ns/cmis/link/200908/acl"" href=""http://cmisexample.oasis-
open.org/rep1/1de1d476-11fb-47bf-b136-8a8d0b4b030a/acl""/>
        <cmisra:object>
            <cmis:properties>
                <cmis:propertyId localName=""rep-cmis:objectId""
propertyDefinitionId=""cmis:objectId"">
                    <cmis:value>1de1d476-11fb-47bf-b136-
8a8d0b4b030a</cmis:value>
                </cmis:propertyId>
            </cmis:properties>
        </cmisra:object>
        <cmisra:pathSegment>invoice3.pdf</cmisra:pathSegment>
    </atom:entry>
</atom:feed>
```

Note: This media type is used on links with relation down (see section 3.4.3.2 Hierarchy Navigation Internet Draft Link Relations~~Hierarchy Navigation Internet Draft Link Relations~~). When the individual resources are returned by the CMIS repository they will use the atom media type (application/atom+xml)

Please also see the example documents included with the schema.

3.3.5 CMIS ACL

Media Type: application/cmisacl+xml

Starting tag: cmis:acl

This document specifies an Access Control List based on the schema in CMIS Domain Model.

Example:

```
<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
```

```
<cmis:acl xmlns:cmis=""http://docs.oasis-open.org/ns/cmis/core/200908/""
xmlns:cmism=""http://docs.oasis-open.org/ns/cmis/messaging/200908/""
xmlns:atom=""http://www.w3.org/2005/Atom""
xmlns:app=""http://www.w3.org/2007/app"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <cmis:permission>
        <cmis:principal>
            <cmis:principalId>Al Brown</cmis:principalId>
        </cmis:principal>
        <cmis:permission>cmis:read</cmis:permission>
        <cmis:permission>cmis:write</cmis:permission>
        <cmis:permission>cmis:all</cmis:permission>
        <cmis:permission>publish</cmis:permission>
        <cmis:direct>true</cmis:direct>
    </cmis:permission>
</cmis:acl>
```

Please also see the example documents included with the schema.

3.4 Atom Extensions for CMIS

3.4.1 Atom Element Extensions

3.4.1.1 AtomPub Workspace

3.4.1.1.1 cmisra:collectionType

This element is included inside the app:collection element. This specifies the cmis collection type.

3.4.1.1.2 cmisra:repositoryInfo

This element is included inside the app:workspace element. This specifies information about the CMIS repository.

3.4.1.1.3 cmis:uritemplate

This element is included inside the app:workspace element. This specifies information about URI templates

3.4.1.2 Atom Feed

3.4.1.2.1 cmisra:numItems

This element is included inside the atom:feed element. This specifies the number of items in the feed.

3.4.1.3 Atom Entry

3.4.1.3.1 cmisra:children

This element is included inside the atom:entry element. This includes the children of the atom entry. This element MUST include an atom:feed element.

3.4.1.3.2 cmisra:object

This element is included inside the atom:entry element for CMIS Document, Folder, Relationship and Policy objects. This specifies the CMIS object information for the atom entry.

3.4.1.3.3 cmisra:pathSegment

This element is included inside the atom:entry element for CMIS Type Definitions that are filable. This specifies the pathSegment for this object in the folder representing the feed.

3.4.1.3.4 cmisra:relativePathSegment

This element is included inside the atom:entry element. This specifies the relative pathSegment for the object in that particular folder. This MUST be used only inside an object parents feed.

3.4.1.3.5 cmisra:type

This element is included inside the atom:entry element for CMIS Type Definitions. This specifies the type definition the atom entry represents.

3.4.1.3.6 cmisra:content

This element specifies the content of the atom:entry element. The content is base64 encoded in the base64 element. The elements of a cmisra:content element are:

- mediaType: This contains the media type of the content as described by RFC4288.
- base64: This contains the base64 content of the file

This element MUST take precedence over atom:content on submission of an atom entry to a repository.

A repository MUST use the atom:content element to return back to the client the content of the document.

Note: This is required when the client has an XML document stored that is might not be well formed and thus would not be able to be included inside atom:content element.

3.4.2 Attributes

These attributes are in the CMIS RestAtom namespace (cmisra).

3.4.2.1 cmisra:id

This attribute is used on the atom:link element to specify the cmis id of the resource. This attribute SHOULD be on all link relations that point to a CMIS object.

This attribute MAY also be on cmisra:type. The value of the attribute on cmis:type MUST be the same as the type definition id.

Example:

```
<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
```

```
<atom:link xmlns:cmis=""http://docs.oasis-open.org/ns/cmis/core/200908/""
xmlns:cmism=""http://docs.oasis-open.org/ns/cmis/messaging/200908/""
xmlns:atom=""http://www.w3.org/2005/Atom""
xmlns:app=""http://www.w3.org/2007/app"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"" type=""application/atom+xml;type=feed""
rel=""down"" href=""http://cmisexample.oasis-open.org/rep1//children/e170da7d-
d322-472d-b1eb-67bdb1ec18ca/1"" cmisra:id=""e170da7d-d322-472d-b1eb-
67bdb1ec18ca""/>
```

Please also see the example documents included with the schema.

3.4.2.2 cmisra:renditionKind

This attribute is used on the atom:link element with relation alternate to specify the renditionKind of the resource. This attribute SHOULD be on all link elements with relation alternate that are a CMIS rendition.

Example:

```
<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<atom:link xmlns:cmis=""http://docs.oasis-open.org/ns/cmis/core/200908/""
xmlns:cmism=""http://docs.oasis-open.org/ns/cmis/messaging/200908/""
xmlns:atom=""http://www.w3.org/2005/Atom""
xmlns:app=""http://www.w3.org/2007/app"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"" type=""text/html"" rel=""alternate""
href=""http://cmisexample.oasis-open.org/rep1//rendition/e170da7d-d322-472d-
b1eb-67bdb1ec18ca/1"" cmisra:renditionKind=""cmis:thumbnail""/>
```

Please also see the example documents included with the schema.

3.4.3 CMIS Link Relations

The listing below outlines the different link relation types in CMIS. This is in addition to the link relations specified by Atom and Atom Publishing Protocol. The registry for link relations is located at http://www.iana.org/assignments/link-relations/link-relations.xhtml.

The link element with a specified relation MUST be included if client can perform the operation. The repository SHOULD omit the link relation if the operation is not available. The operation may not be available due to a variety of reasons such as access control, administrative policies, or other mechanisms.

Links may have the following attribute in addition to the ones specified by Atom and Atom Publishing Protocol:

- (CMIS) id: Specifies the CMIS ID of the resource referenced by the link. Repositories SHOULD include this attribute for elements such as atom:link that point to CMIS resources that have an id.

These are the link relation types specified by CMIS:

3.4.3.1 Existing Link Relations

Existing link relations should be used where appropriate by the implementation. In addition, the following link relations are leveraged for the CMIS specification:

- self
    - This link relation provides the URI to retrieve this resource again.

    - Service: The appropriate service that generated the atom entry or feed.
    - Resources: All except AllowableActions, ACL and Content Streams
- service
    - The service link relation when provided on a CMIS resource MUST point to an AtomPub service document with only one workspace element. This workspace element MUST represent the repository containing that resource.
    - Media Type: application/atomsvc+xml
    - Resources: All except AllowableActions, ACL and Content Streams
- describedby
    - When used on a CMIS resource, this link relation MUST point to an atom entry that describes the type of that resource.
    - Service: getTypeDefinition on specified object
    - Media Type: application/atom+xml;type=entry
    - Resources: CMIS Document, CMIS Folder, CMIS Relationship, CMIS Policy objects and CMIS Types
- via
    - When used on an Atom Feed document, this link relation MUST point to the atom entry representing the CMIS resource from whom this feed is derived.
    - Media Type: application/atom+xml;type=entry
    - Resources: All CMIS Feeds and Collections
- edit-media
    - When used on a CMIS document resource, this link relation MUST point to the URI for content stream of the CMIS document. This URI MUST be used to set or delete the content stream. This URI MAY be used to retrieve the content stream for the document.
    - Service: setContentStream (PUT) , deleteContentStream (DELETE)
    - Media Type: Specific to resource
    - Resources: CMIS Document
- edit
    - When used on a CMIS resource, this link relation MUST provide an URI that can be used with the HTTP PUT method to modify the atom:entry for the CMIS resource
    - Service: getObject (GET), updateProperties (PUT)
    - Media Type: application/atom+xml;type=entry
    - Resources: CMIS Documents, CMIS Folders, CMIS Relationships and CMIS Policies
- alternate
    - This is used to express Renditions on a CMIS resource. See section 3.1.6 Renditions.
    - Service: getContentStream for specified rendition
    - Resources: CMIS Document, CMIS Folder and CMIS Policies
- first
    - This is used for Paging. Please see the AtomPub specification.
    - Media Type: application/atom+xml;type=feed
    - Resources: All Feeds
- previous
    - This is used for Paging. Please see the AtomPub specification.
    - Media Type: application/atom+xml;type=feed

    - Resources: All Feeds
- next
    - This is used for Paging. Please see the AtomPub specification.
    - Media Type: application/atom+xml;type=feed
    - Resources: All Feeds
- last
    - This is used for Paging. Please see the AtomPub specification.
    - Media Type: application/atom+xml;type=feed
    - Resources: All Feeds

Please see http://www.iana.org/assignments/link-relations/link-relations.xhtml for more information on these link relations.

3.4.3.2 Hierarchy Navigation Internet Draft Link Relations

CMIS leverages the following link relations:

- up
    - Service: getFolderParent, getObjectParents, getTypeDefnition, getObject
    - Media Type: application/atom+xml;type=feed, application/atom+xml;type=entry
    - Resources: CMIS Document, CMIS Folder, CMIS Type Definitions, CMIS Folder Children, CMIS Folder Descendants, CMIS FolderTree, CMIS Type Children, CMIS Type Descendants
        - This link relation is not included on CMIS Base Type Definitions or the CMIS Root Folder
- down
    - Service: getChildren, getDescendants, getTypeChildren, getTypeDescendants
    - Media Type:
        - For children: application/atom+xml;type=feed
        - For descendants: application/cmistree+xml
            - The descendants feed resource when retrieved from the CMIS repository will use the Atom Feed Media Type (application/atom+xmll;type=feed)
    - Resources: CMIS Folder, Type

3.4.3.3 Versioning Internet Draft Link Relations

CMIS leverages the following link relations from the Internet Draft:

- version-history
    - Service: getAllVersions
    - Media Type: application/atom+xml;type=feed
    - Resources: CMIS Document
- current-version
    - Service: getObjectForLatestVersion
    - Media Type: application/atom+xml;type=entry
    - Resources: CMIS Document
- working-copy

- Service: getObject for private-working-copy specified by cmis:versionSeriesCheckedOutId property
- Media Type: application/atom+xml;type=entry
- Resources: CMIS Document

3.4.3.4 CMIS Specific Link Relations

CMIS defines the following link relations:

- http://docs.oasis-open.org/ns/cmis/link/200908/allowableactions
  - This link relation MUST point to a resource containing a CMIS AllowableActions document for the CMIS resource containing this link relation.
  - Service: getAllowableActions
  - Media Type: application/cmisallowableactions+xml
  - Resources: CMIS Documents, CMIS Folders, CMIS Policies, and CMIS Relationships
- http://docs.oasis-open.org/ns/cmis/link/200908/relationships
  - This link relation MUST point to a resource containing an Atom Feed of CMIS relationship resources for the CMIS resource containing this link relation.
  - Service: getObjectRelationships
  - Media Type: application/atom+xml;type=feed
  - Resources: CMIS Documents, CMIS Folders, and CMIS Policies
- http://docs.oasis-open.org/ns/cmis/link/200908/source
  - When used on a CMIS Relationship resource, this link relation MUST point to an atom entry document for the CMIS Resource specified by the cmis:sourceId property on the relationship.
  - Source Link on Relationship
  - Media Type: application/atom+xml;type=entry
  - Resources: CMIS Relationships
- http://docs.oasis-open.org/ns/cmis/link/200908/target
  - When used on a CMIS Relationship resource, this link relation MUST point to an atom entry document for the CMIS Resource specified by the cmis:targetId property on the relationship.
  - Target Link on Relationship
  - Media Type: application/atom+xml;type=entry
  - Resources: CMIS Relationships
- http://docs.oasis-open.org/ns/cmis/link/200908/policies
  - This link relation MUST point to a resource containing an Atom Feed of CMIS Policy resources for the CMIS resource containing this link relation.
  - Service: getAppliedPolicies
  - Media Type: application/atom+xml;type=feed
  - Resources: CMIS Documents and CMIS Folders
- http://docs.oasis-open.org/ns/cmis/link/200908/acl
  - This link relation MUST point to a resource containing a CMIS ACL document for the CMIS resource containing this link relation.
  - Service: getACL
  - Media Type: application/cmisacl+xml

        - Resources: CMIS Documents, CMIS Folders, CMIS Relationships, and CMIS Policies that are securable
    - http://docs.oasis-open.org/ns/cmis/link/200908/changes
        - This link relation MUST point to an Atom Feed containing the set of changes
        - Service: getContentChanges
        - Media Type: application/atom+xml;type=feed
        - Resources: AtomPub Workspace Element in Service Document
    - http://docs.oasis-open.org/ns/cmis/link/200908/foldertree
        - Used in AtomPub Service Document to identify the folder tree for a specified folder
        - Service: getFolderTree
        - Media Type: application/atom+xml;type=feed
        - Resources: CMIS Folder, also used in AtomPub Service Document for root folder
    - http://docs.oasis-open.org/ns/cmis/link/200908/typedescendants
        - Used in AtomPub Service Document to identify the base types descendants
        - Service: getTypeDescendants
        - Media Type: application/atom+xml;type=feed
        - Resources: AtomPub Workspace Element in Service Document
    - http://docs.oasis-open.org/ns/cmis/link/200908/rootdescendants
        - Used in AtomPub Service Document to identify the root folder descendants
        - Service: getDescendants for root folder
        - Media Type: application/atom+xml;type=feed
        - Resources: AtomPub Workspace Element in Service Document

3.5 Atom Resources

For all Atom Resources used in this specification, the following MUST be followed:

3.5.1 Feeds

Any feed MUST be a valid Atom Feed document and conform to the guidelines below for cmis objects:

- atom:updated SHOULD be the latest time the folder or its contents was updated. If unknown by the underlying repository, it MUSTbe the current time.
- atom:author/atom:name MUST be the CMIS property cmis:createdBy
- atom:title MUST be the CMIS property cmis:name
- The atom:link with relation self MUST be generated to return the URI of the feed. If paging or any other mechanism is used to filter, sort, or change the representation of the feed, the URI MUST point back a resource with the same representation.
- A feed SHOULD contain the element app:collection, describing the appropriate media types supported for creation of new entries in the feed
- atom:id SHOULD be derived from cmis:objectId. This id MUST be compliant with atom's specification and be a valid URI.
- Feeds MAY be paged via the link relations specified in AtomPub. If more items are available than contained in the feed, then a link with the relation next MUST be included in the feed.

Any feed MUST be a valid Atom Feed document and conform to the guidelines below for cmis types:

- atom:updated SHOULD be the latest time type definition was updated. If unknown by the underlying repository, it MUSTbe the current time.
- atom:author/atom:name is repository specific
- atom:title MUST be the displayName attribute of the CMIS Type Definition.
- The atom:link with relation self MUST be generated to return the URI of the feed
- atom:id SHOULD be derived from the id attribute of the CMIS Type Definition. This id MUST be compliant with atom~~’~~'s specification and be a valid URI.
- Feeds MAY be paged via the link relations specified in AtomPub. If more items are available than contained in the feed, then a link with the relation next MUST be included in the feed.

If on the root type, all fields are repository specific.

Ordering of entries in a feed is repository-specific if orderBy argument is not specified. If orderBy argument is specified, the order of the entries in the feed SHOULD conform to the ordering specified by the orderBy argument.

Note: Please see feedvalidator.org to validate Atom compliance.

3.5.2 Entries

At any point where an Atom document of type Entry is sent or returned, it must be a valid Atom Entry document and conform to the guidelines below for a cmis object:

- atom:title MUST be the cmis:name property
- app:edited MUST be cmis:lastModificationDate~~lastModifiedDate~~
- atom:updated MUST be cmis:lastModificationDate~~lastModifiedDate~~
- atom:published MUST be cmis:creationDate~~createdDate~~
- atom:author/atom:name MUST be cmis:createdBy
- All CMIS properties MUST be exposed in CMIS cmis:properties elements even if they are duplicated in an atom element
- atom:id SHOULD be derived from cmis:objectId. This id MUST be compliant with atom~~’~~'s specification and be a valid ~~URI~~IRI.
- The repository SHOULD populate the atom:summary tag with text that best represents a summary of the object. For example, an HTML table containing the properties and their values or the description of the document if available.

For Documents that support Content Streams:

The repository SHOULD use the atom:content/src attribute to point to the content stream. The client SHOULD use cmisra:content if the content is not well-formed or would have trouble fitting inside an atom:content element. The repository MUST use the cmisra:content element if provided by the client over the atom:content element.

Other Objects (Folders, Relationships, and other Document Types that do not support Content Streams, etc):

The repository MUST comply with the atom specification and have an atom:content element. This is repository specific. Any value in the content field MUST be ignored if the atom entry represents a non-document object by the CMIS repository when the atom entry is POST~~’~~-ed to a collection or sent to the repository via a PUT.

When POSTing an Atom Document, the Atom elements MUST take precedence over the corresponding writable CMIS property. For example, atom:title will overwrite cmis:name.

At any point where an Atom document of CMIS Type is sent or returned, it must be a valid Atom Entry document and conform to the guidelines below for a cmis type definition:

- atom:title MUST be the cmis:displayName
- The repository SHOULD populate the atom:summary tag with text that best represents a summary of the object. For example, the type description if available.
- The repository MUST comply with the atom specification and have an atom:content element. This is repository specific. Any value in the content field MUST be ignored if the atom entry represents a non-document object by the CMIS repository when the atom entry is POST~~’~~-ed to a collection or sent to the repository via a PUT.

Any atom element that is not specified is repository-specific.

3.5.2.1 Hierarchical Atom Entries

The repository SHOULD NOT provide any links to hierarchical objects if those capabilities are not supported with the exception of getTypeDescendants which is required

For atom entries that are hierarchical such as Folder Tree or Descendants, the repository MUST populate a cmisra:children element in the atom:entry with the enclosing feed of its direct children. This pattern continues until the depth is satisfied.

The cmisra:children element MUST include an atom:feed element that contains the children entries of this resource.

If an entry does not contain cmisra:children element, then the entry MAY have children even though it is not represented in the atom entry.

For Example, here is a minimal Atom Entry with CMIS Children Extension Element:

```
<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<atom:entry xmlns:cmis=""http://docs.oasis-open.org/ns/cmis/core/200908/""
xmlns:cmism=""http://docs.oasis-open.org/ns/cmis/messaging/200908/""
xmlns:atom=""http://www.w3.org/2005/Atom""
xmlns:app=""http://www.w3.org/2007/app"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:author>
        <atom:name>Al Brown</atom:name>
    </atom:author>
    <atom:content src=""http://cmisexample.oasis-open.org/rep1/af1d8c7f-b554-
4dfb-bfe1-1f41e4b34fef""/>
    <atom:id>urn:uuid:af1d8c7f-b554-4dfb-bfe1-1f41e4b34fef</atom:id>
    <atom:title type=""text"">CMIS Example Folder as Customer
type</atom:title>
    <atom:updated>2010-01-25T10:20:57.818-08:00</atom:updated>
    <cmisra:object>
        <cmis:properties>
```

```
            <cmis:propertyId localName=""rep-cmis:objectId"" 
propertyDefinitionId=""cmis:objectId"">
                <cmis:value>af1d8c7f-b554-4dfb-bfe1-1f41e4b34fef</cmis:value>
            </cmis:propertyId>
        </cmis:properties>
    </cmisra:object>
    <cmisra:pathSegment>customer</cmisra:pathSegment>
    <cmisra:children>
        <atom:feed>
            <atom:title type=""text"">CMIS Example Folder as Customer 
type</atom:title>
            <atom:author>
                <atom:name>Al Brown</atom:name>
                <atom:uri>http://www.ibm.com/</atom:uri>
                <atom:email>albertcbrown@us.ibm.com</atom:email>
            </atom:author>
            <atom:updated>2010-01-25T10:20:57.818-08:00</atom:updated>
            <atom:id>urn:uuid:ce2d65af-b246-454b-90ff-0986d9b05178</atom:id>
            <atom:link type=""application/atom+xml;type=feed"" rel=""self"" 
href=""http://cmisexample.oasis-open.org/rep1/af1d8c7f-b554-4dfb-bfe1-
1f41e4b34fef/3""/>
            <atom:link type=""application/atomsvc+xml"" rel=""service"" 
href=""http://cmisexample.oasis-open.org/rep1//service""/>
            <atom:link type=""application/atom+xml;type=entry"" rel=""via"" 
href=""http://cmisexample.oasis-open.org/rep1/af1d8c7f-b554-4dfb-bfe1-
1f41e4b34fef""/>
            <atom:link type=""application/atom+xml;type=feed"" 
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/foldertree"" 
href=""http://cmisexample.oasis-open.org/rep1/af1d8c7f-b554-4dfb-bfe1-
1f41e4b34fef/foldertree""/>
            <atom:link type=""application/atom+xml;type=feed"" rel=""down"" 
href=""http://cmisexample.oasis-open.org/rep1/af1d8c7f-b554-4dfb-bfe1-
1f41e4b34fef/children""/>
            <atom:link type=""application/atom+xml;type=entry"" rel=""up"" 
href=""http://cmisexample.oasis-open.org/rep1/2eb09309-58f7-4627-b735-
4d5cf4ba6554""/>
            <atom:entry>
                <atom:author>
                    <atom:name>Al Brown</atom:name>
                </atom:author>
                <atom:content src=""http://cmisexample.oasis-
open.org/rep1/af1d8c7f-b554-4dfb-bfe1-1f41e4b34fef""/>
                <atom:id>urn:uuid:af1d8c7f-b554-4dfb-bfe1-
1f41e4b34fef</atom:id>
                <atom:title type=""text"">CMIS Example Child of 
Folder</atom:title>
                <atom:updated>2010-01-25T10:20:57.818-08:00</atom:updated>
                <cmisra:object>
                    <cmis:properties>
                        <cmis:propertyId localName=""rep-cmis:objectId"" 
propertyDefinitionId=""cmis:objectId"">
                            <cmis:value>af1d8c7f-b554-4dfb-bfe1-
1f41e4b34fef</cmis:value>
                        </cmis:propertyId>
                    </cmis:properties>
                </cmisra:object>
                <cmisra:pathSegment>document</cmisra:pathSegment>
            </atom:entry>
        </atom:feed>
    </cmisra:children>
</atom:entry>
```

Please also see the example documents included with the schema.

3.6 AtomPub Service Document (Repository)

The AtomPub Service Document contains the set of repositories that are available.   Each repository is mapped to a app:workspace element in the AtomPub Service document.

CMIS Services exposed:

GET: getRepositories, getRepositoryInfo

Media Type: application/atomsvc+xml

How the client will get the initial AtomPub (APP) service document or the URI for the service document is repository specific. Examples are via URI, or loading the service document from disk.

The service document will be available from Atom Entry and Atom Feed documents via a link relationship, service. That AtomPub service document MUST contain only one workspace element which MUST be the workspace representing the repository containing the Atom Entry or Atom Feed document.

A workspace element for a CMIS repository MUST have a collection element for each of following collections: Each collection MUST also contain a cmisra:collectionType element with the given value:

- Root Folder Children Collection: Root folder of the Repository
    - ~~“~~'root~~”~~' for the children collection of the root folder
    - cmisra:collectiontype=~~’~~'root~~’~~'
- Types Children Collection: Collection containing the base types in the repository
    - ~~“~~'types~~”~~' for the children collection
    - cmisra:collectiontype=~~’~~'types~~’~~'

The workspace element SHOULD contain these collections if the repository supports this functionality:

- CheckedOut collection: collection containing all checked out documents user can see
    - ~~“~~'checkedout~~”~~'
    - cmisra:collectiontype=~~’~~'checkedout~~’~~'
- Query collection: Collection for posting queries to be executed
    - ~~“~~'query~~”~~'
    - cmisra:collectiontype=~~’~~'query~~’~~'
- Unfiled folder: Folder for posting documents to be unfiled; read can be disabled
    - ~~“~~'unfiled~~”~~'
    - cmisra:collectiontype=~~’~~'unfiled~~’~~'

The repository MUST include the URI templates in the workspace elements.

The workspace element MUST also contain the following link element with the relation:

- http://docs.oasis-open.org/ns/cmis/link/200908/typedescendants: This link relation points to the types descendants for the base types in the repository.

The workspace element MUST contain the following link elements of the following relations for those services which are supported by the repository:

- http://docs.oasis-open.org/ns/cmis/link/200908/foldertree: This link relation points to the folder tree of the root folder. See Folder Tree resource for more information.
- http://docs.oasis-open.org/ns/cmis/link/200908/rootdescendants: This link relation points to the Root Folder Descendants Feed for the root folder.
- http://docs.oasis-open.org/ns/cmis/link/200908/changes:This link relation points to the changes feed for the repository.

The workspace element may include app:collection element for the collections that represent folders in the repository. However, an alternative approach, especially for a repository with many folders, is to not enumerate those collections here, but include the app:collection element per RFC5023 in the Atom Feed document.

3.6.1 URI Templates

CMIS defines the following URI Templates:

- objectbyid
- objectbypath
- query
- typebyid

Repositories MUST provide the following URI Templates:

- objectbyid
- objectbypath
- typebyid

Repositories MUST provide the URI Template query if the repository supports query.

URI Templates MUST only be used with HTTP GET.

Repositories MAY extend that set of templates. Those URI Template Types will be repository specific. Repositories MAY have more than one entry per URI Template type if the entries have different media types.

URI Templates are simple replacement of the template parameter with the specified value. If a client does not want to specify a value for some of these variables, then the client MUST substitute an empty string for the variable.

For example, if the URI template that supports the variable {id} is

```
http://example.org/rep1/getbyid/{id}
```

If the client wants to find the entry for an object with an id of "obj_1" then the URI would be:

```
http://example.org/rep1/getbyid/obj_1
```

Arguments that are substituted for URI template parameters MUST be percent escaped according to RFC3986. Please see that RFC for more information.

All variables MUST be in the template.

Structure of URI Template:

```
   <xs:complexType name="cmisUriTemplateType">
          <xs:sequence>
                 <xs:element name="template" type="xs:string"  />
                 <xs:element name="type" type="xs:string"  />
                 <xs:element name="mediatype" type="xs:string"  />
                 <xs:any processContents="lax" namespace="##other"
minOccurs="0"
                        maxOccurs="unbounded" />
          </xs:sequence>
   </xs:complexType>
```

Example of URI Template element in an AtomPub Workspace Element:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<cmisra:uritemplate xmlns:cmis="http://docs.oasis-open.org/ns/cmis/core/200908/" xmlns:cmism="http://docs.oasis-open.org/ns/cmis/messaging/200908/"
xmlns:atom="http://www.w3.org/2005/Atom"
xmlns:app="http://www.w3.org/2007/app" xmlns:cmisra="http://docs.oasis-open.org/ns/cmis/restatom/200908/">
    <cmisra:template>http://cmisexample.oasis-open.org/rep1/objectbyid/{id}?filter={filter}&amp;includeAllowableActions={includeAllowableActions}&amp;includePolicyIds={includePolicyIds}&amp;includeRelationships={includeRelationships}&amp;includeACL={includeACL}</cmisra:template>
    <cmisra:type>objectbyid</cmisra:type>
    <cmisra:mediatype>application/atom+xml;type=entry</cmisra:mediatype>
</cmisra:uritemplate>
```

Please also see the example documents included with the schema.

3.6.1.1 Object By Id

This URI template provides a method for creating an URI that directly accesses an atom entry representing documents, folders, policies or relationship objects. See section 3.10 for more information.

Type: objectbyid

Media Type: application/atom+xml;type=entry

Service: getObjectById

Variables that are supported by the template:

- {id}: Id of object
- {filter}: Property Filter
- {includeAllowableActions}
    - Valid values: true, false
- {includePolicyIds}: Include Policy Ids:
    - Valid values: true, false

- {includeRelationships}: Include relationships
  - Valid values: See enumIncludeRelationships
- {includeACL}: Include ACLs
  - Valid values: true, false
- {renditionFilter}
  - Valid values: Please see renditionFilter in CMIS Domain Model

Example:

```
<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<cmisra:uritemplate xmlns:cmis=""http://docs.oasis-
open.org/ns/cmis/core/200908/"" xmlns:cmism=""http://docs.oasis-
open.org/ns/cmis/messaging/200908/""
xmlns:atom=""http://www.w3.org/2005/Atom""
xmlns:app=""http://www.w3.org/2007/app"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <cmisra:template>http://cmisexample.oasis-
open.org/rep1/objectbyid/{id}?filter={filter}&amp;includeAllowableActions={inc
ludeAllowableActions}&amp;includePolicyIds={includePolicyIds}&amp;includeRelat
ionships={includeRelationships}&amp;includeACL={includeACL}</cmisra:template>
    <cmisra:type>objectbyid</cmisra:type>
    <cmisra:mediatype>application/atom+xml;type=entry</cmisra:mediatype>
</cmisra:uritemplate>
```

Please also see the example documents included with the schema.

3.6.1.2 Object By Path

This URI template provides a method for creating an URI that directly accesses an atom entry representing documents, folders or policy objects. See section 3.10 for more information.

Type: objectbypath

Media Type: application/atom+xml;type=entry

Service: getObjectByPath

Variables that are supported by the template:

- {path}: Path of Object
- {filter}: Property Filter
- {includeAllowableActions}: Boolean for include Allowable Actions
  - Valid values: true, false
- {includePolicyIds}: Include Policy Ids:
  - Valid values: true, false
- {includeRelationships}: Include relationships
  - Valid values: See enumIncludeRelationships
- {includeACL}: Include ACLs
  - Valid values: true, false
- {renditionFilter}

- ○ Valid values: Please see renditionFilter in CMIS Domain Model

Example:

```
<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<cmisra:uritemplate xmlns:cmis=""http://docs.oasis-
open.org/ns/cmis/core/200908/"" xmlns:cmism=""http://docs.oasis-
open.org/ns/cmis/messaging/200908/""
xmlns:atom=""http://www.w3.org/2005/Atom""
xmlns:app=""http://www.w3.org/2007/app"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <cmisra:template>http://cmisexample.oasis-
open.org/rep1/objectbypath?p={path}&amp;filter={filter}&amp;includeAllowableAc
tions={includeAllowableActions}&amp;includePolicyIds={includePolicyIds}&amp;in
cludeRelationships={includeRelationships}&amp;includeACL={includeACL}</cmisra:
template>
    <cmisra:type>objectbypath</cmisra:type>
    <cmisra:mediatype>application/atom+xml;type=entry</cmisra:mediatype>
</cmisra:uritemplate>
```

Please also see the example documents included with the schema.

3.6.1.3 Query

Type: query

Media Type: application/atom+xml;type=feed

Service: query

Variables that are supported by the template:

- {q}: CMIS Query Statement
- {searchAllVersions}: Boolean, true if to search all versions
- {maxItems}: Integer, Max items to return
- {skipCount}: Integer, Items to skip
- {includeAllowableActions}: Boolean
- {includeRelationships}: Boolean

Example:

```
<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<cmisra:uritemplate xmlns:cmis=""http://docs.oasis-
open.org/ns/cmis/core/200908/"" xmlns:cmism=""http://docs.oasis-
open.org/ns/cmis/messaging/200908/""
xmlns:atom=""http://www.w3.org/2005/Atom""
xmlns:app=""http://www.w3.org/2007/app"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
```

```
    <cmisra:template>http://cmisexample.oasis-open.org/rep1/query?q={q}&amp;searchAllVersions={searchAllVersions}&amp;maxItems={maxItems}&amp;skipCount={skipCount}&amp;includeAllowableActions={includeAllowableActions}=&amp;includeRelationships={includeRelationships}</cmisra:template>
    <cmisra:type>query</cmisra:type>
    <cmisra:mediatype>application/atom+xml;type=feed</cmisra:mediatype>
</cmisra:uritemplate>

```

Please also see the example documents included with the schema.

3.6.1.4 Type By Id

Type: typebyid

Media Type: application/atom+xml;type=entry

Service: getTypeDefinition

Variables that are supported by the template:

- {id}: CMIS Type Id

Example:

```
<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<cmisra:uritemplate xmlns:cmis=""http://docs.oasis-open.org/ns/cmis/core/200908/"" xmlns:cmism=""http://docs.oasis-open.org/ns/cmis/messaging/200908/""
xmlns:atom=""http://www.w3.org/2005/Atom""
xmlns:app=""http://www.w3.org/2007/app"" xmlns:cmisra=""http://docs.oasis-open.org/ns/cmis/restatom/200908/"">
    <cmisra:template>http://cmisexample.oasis-open.org/rep1/type?id={id}</cmisra:template>
    <cmisra:type>query</cmisra:type>
    <cmisra:mediatype>application/atom+xml;type=entry</cmisra:mediatype>
</cmisra:uritemplate>
```

Please also see the example documents included with the schema.

3.6.2 HTTP Methods

3.6.2.1 GET

This retrieves the AtomPub Service document for a specified repository. This exposes the capabilities defined in getRepositories and getRepositoryInfo in the Domain Model.

The optional argument MAY be specified:

- repositoryId:

  - This query parameter allows a client to specify a different repository than the one that is referenced by the URI.
  - If specified, the repository MUST return the AtomPub services document for the specified repository if that repository exists.
  - If not specified, the repository MUST return the service document for the repository that is referenced by URI.

3.7 Service Collections

These are the collections that are included on an AtomPub Service document in the workspace element.

For any HTTP verb not specified on a resource,each implementation MAY chose to implement that HTTP verb in a repository-specific manner.

3.7.1 Root Folder Collection

This is a collection described in the service document. Please see Folder Children.

3.7.2 Query Collection

This is a collection for processing queries. If the implementation supports GET on this collection, then the implementation SHOULD at least return a feed consisting of zero or more atom entries. These atom entries should represent persisted objects related to query such as persisted queries, long running queries or search templates.

CMIS Services exposed via HTTP verbs:

POST: Query

Media Type: application/atom+xml;type=feed

Accept:

- MUST support CMIS Query document,
- MAY support other media type

Link Relations on resulting feed from Query Collection:

- service: Points to service document containing the CMIS repository. The service document MUST contain only one workspace element.
  - Media Type: application/atomsvc+xml
- paging link relations as appropriate: first, next, previous, last

The following CMIS Atom extension element MAY be included inside the atom feed:

- cmisra:numItems

The following CMIS Atom extension element MUST be included inside the atom entries:

- cmisra:object inside atom:entry

3.7.2.1 POST

This collection MUST accept CMIS Query documents (application/cmisquery+xml).

Upon submission (creation) of a query document, a response must be returned with a Location header representing the feed for that query. If the query cannot be performed and an atom feed returned, the repository MUST return the appropriate HTTP status code. In addition, the server SHOULD return the feed directly. If the server does so, the server should also return the Content-Location header.

The feed returned MUST contain a set of atom entries representing the result set from the query.

The atom entries should contain the bare minimum necessary for Atom compliance [RFC4287]. The atom entries MUST contain the CMIS extension element (cmisra:object) containing the properties specified by the query in the select clause of the query statement.

If all the selected properties can be mapped to the same type reference, then the repository MAY include additional information in the atom entry.

Please see http://tools.ietf.org/html/rfc5023#section-5.3.

Status Codes:

- 201 Success

Headers returned:

- Location Header
- Content-Location Header

Link Relations on resulting feed from POST to Query Collection:

- service: Points to service document containing the CMIS repository. The service document MUST contain only one workspace element.
    - Media Type: application/atomsvc+xml
- paging link relations as appropriate: first, next, previous, last

Example client request:

```
POST /Query HTTP/1.1
Host: example.org
Content-Length: 756
Content-Type: application/cmisquery+xml


<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<cmis:query xmlns:app=""http://www.w3.org/2007/app""
xmlns:atom=""http://www.w3.org/2005/Atom"" xmlns:cmis=""http://docs.oasis-
open.org/ns/cmis/core/200908/"" xmlns:cmism=""http://docs.oasis-
open.org/ns/cmis/messaging/200908/"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <cmis:statement>SELECT cmis:objectId FROM cmis:document</cmis:statement>
    <cmis:searchAllVersions>true</cmis:searchAllVersions>
    <cmis:includeAllowableActions>false</cmis:includeAllowableActions>
    <cmis:includeRelationships>none</cmis:includeRelationships>
    <cmis:renditionFilter>*</cmis:renditionFilter>
    <cmis:maxItems>50</cmis:maxItems>
    <cmis:skipCount>0</cmis:skipCount>
</cmis:query>
```

Example server response:

```
HTTP/1.1 201 Created
Date: Mon, 25 Jan 2010 10:21:00 -0800
Content-Length: 1830
Content-Type: application/atom+xml;type=feed
Content-Location: http://cmisexample.oasis-open.org/rep1/queryresult/44ce5b47-
ebc3-4513-86e0-d3f46c77d0a8
Location: http://cmisexample.oasis-open.org/rep1/queryresult/44ce5b47-ebc3-
4513-86e0-d3f46c77d0a8


<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<atom:feed xmlns:app=""http://www.w3.org/2007/app""
xmlns:atom=""http://www.w3.org/2005/Atom"" xmlns:cmis=""http://docs.oasis-
open.org/ns/cmis/core/200908/"" xmlns:cmism=""http://docs.oasis-
open.org/ns/cmis/messaging/200908/"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:title type=""text"">CMIS Query Result for SELECT cmis:objectId FROM
cmis:document</atom:title>
    <atom:author>
        <atom:name>Al Brown</atom:name>
        <atom:uri>http://www.ibm.com/</atom:uri>
        <atom:email>albertcbrown@us.ibm.com</atom:email>
    </atom:author>
    <atom:updated>2010-01-25T10:21:00.427-08:00</atom:updated>
    <atom:id>urn:uuid:811b1b9b-80f5-4788-b46c-aa77564e294b</atom:id>
    <atom:link type=""application/atom+xml;type=feed"" rel=""self""
href=""http://cmisexample.oasis-open.org/rep1/11355977-434b-4e71-b83a-
77dea9878e04/3""/>
    <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
    <atom:entry>
        <atom:author>
            <atom:name>Al Brown</atom:name>
        </atom:author>
        <atom:content src=""http://cmisexample.oasis-open.org/rep1/a3386ea0-
0477-4a74-96bd-70d3da1c483a""/>
        <atom:id>urn:uuid:a3386ea0-0477-4a74-96bd-70d3da1c483a</atom:id>
        <atom:title type=""text"">Resulting Document</atom:title>
        <atom:updated>2010-01-25T10:21:00.427-08:00</atom:updated>
        <cmisra:object>
            <cmis:properties>
                <cmis:propertyId queryName=""cmis:objectId"" localName=""rep-
cmis:objectId"" propertyDefinitionId=""cmis:objectId"">
                    <cmis:value>a3386ea0-0477-4a74-96bd-
70d3da1c483a</cmis:value>
                </cmis:propertyId>
            </cmis:properties>
        </cmisra:object>
    </atom:entry>
</atom:feed>
```

Please also see the example documents included with the schema.

3.7.3 Checked Out Collection

This is a collection described in the service document that contains the private working copies (PWCs) of the checkedout documents in the repository.

CMIS Services:

GET: getCheckedOutDocs

POST: checkOut

Media Type: application/atom+xml;type=feed

Accept:

- MUST support Atom Entry Documents with CMIS extensions
  - application/atom+xml;type=entry or
  - application/cmisatom+xml
- MAY support other media type

Link Relations:

- service: Points to service document containing the CMIS repository. The service document MUST contain only one workspace element.
  - Media Type: application/atomsvc+xml
- paging link relations as appropriate: first, next, previous, last

The following CMIS Atom extension element MAY be included inside the atom feed:

- cmisra:numItems

The following CMIS Atom extension element MUST be included inside the atom entries:

- cmisra:object inside atom:entry

3.7.3.1 GET

The following arguments may be supplied. Please see the domain model for more information:

- filter
- folderId
- maxItems
- skipCount
- renditionFilter
- includeAllowableActions
- includeRelationships

3.7.3.2 POST

When an atom entry is POST~~’~~'ed to this collection, the atom entry will be checked out. A Content-Location header MUST be returned containing the location of the private working copy.

Example client request:

```
POST /CheckedOut HTTP/1.1
Host: example.org
Content-Length: 1044
Content-Type: application/atom+xml;type=entry


<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
```

```
<atom:entry xmlns:app=""http://www.w3.org/2007/app""
xmlns:atom=""http://www.w3.org/2005/Atom"" xmlns:cmis=""http://docs.oasis-
open.org/ns/cmis/core/200908/"" xmlns:cmism=""http://docs.oasis-
open.org/ns/cmis/messaging/200908/"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:author>
        <atom:name>Al Brown</atom:name>
    </atom:author>
    <atom:content src=""http://cmisexample.oasis-open.org/rep1/8d32d716-701b-
4491-84e8-ad57c8230940""/>
    <atom:id>urn:uuid:8d32d716-701b-4491-84e8-ad57c8230940</atom:id>
    <atom:title type=""text"">CMIS Example Document to checkout</atom:title>
    <atom:updated>2010-01-25T10:21:00.380-08:00</atom:updated>
    <cmisra:object>
        <cmis:properties>
            <cmis:propertyId localName=""rep-cmis:objectId""
propertyDefinitionId=""cmis:objectId"">
                <cmis:value>8d32d716-701b-4491-84e8-ad57c8230940</cmis:value>
            </cmis:propertyId>
        </cmis:properties>
    </cmisra:object>
</atom:entry>
```

Example server response:

```
HTTP/1.1 201 Created
Date: Mon, 25 Jan 2010 10:21:00 -0800
Content-Length: 7846
Content-Type: application/atom+xml;type=entry
Content-Location: http://cmisexample.oasis-open.org/rep1/6cce57fc-4e31-491c-
8fab-4aa6e6797dbe
Location: http://cmisexample.oasis-open.org/rep1/6cce57fc-4e31-491c-8fab-
4aa6e6797dbe


<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<atom:entry xmlns:app=""http://www.w3.org/2007/app""
xmlns:atom=""http://www.w3.org/2005/Atom"" xmlns:cmis=""http://docs.oasis-
open.org/ns/cmis/core/200908/"" xmlns:cmism=""http://docs.oasis-
open.org/ns/cmis/messaging/200908/"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:author>
        <atom:name>Al Brown</atom:name>
        <atom:uri>http://www.ibm.com/</atom:uri>
        <atom:email>albertcbrown@us.ibm.com</atom:email>
    </atom:author>
    <atom:content src=""http://cmisexample.oasis-open.org/rep1/6cce57fc-4e31-
491c-8fab-4aa6e6797dbe""/>
    <atom:id>urn:uuid:6cce57fc-4e31-491c-8fab-4aa6e6797dbe</atom:id>
    <atom:title type=""text"">CMIS Example Child of Folder</atom:title>
    <atom:updated>2010-01-25T10:21:00.396-08:00</atom:updated>
    <atom:link rel=""self"" href=""http://cmisexample.oasis-
open.org/rep1/6cce57fc-4e31-491c-8fab-4aa6e6797dbe""/>
    <atom:link rel=""edit"" href=""http://cmisexample.oasis-
open.org/rep1/6cce57fc-4e31-491c-8fab-4aa6e6797dbe""/>
    <atom:link type=""application/cmis+xml;type=allowableActions""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/allowableactions""
href=""http://cmisexample.oasis-open.org/rep1/6cce57fc-4e31-491c-8fab-
4aa6e6797dbe/allowableactions""/>
    <atom:link type=""application/atom+xml;type=entry"" rel=""describedby""
href=""http://cmisexample.oasis-open.org/rep1/6cce57fc-4e31-491c-8fab-
4aa6e6797dbe/type""/>
```

```
    <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
    <atom:published>2010-01-25T10:21:00.396-08:00</atom:published>
    <atom:summary type=""html"">HTML summary of Entry  6cce57fc-4e31-491c-
8fab-4aa6e6797dbe</atom:summary>
    <atom:link rel=""edit-media"" href=""http://cmisexample.oasis-
open.org/rep1/6cce57fc-4e31-491c-8fab-4aa6e6797dbe/edit-media""/>
    <atom:link rel=""alternate"" href=""http://cmisexample.oasis-
open.org/rep1/6cce57fc-4e31-491c-8fab-4aa6e6797dbe/alternate""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""up""
href=""http://cmisexample.oasis-open.org/rep1/6cce57fc-4e31-491c-8fab-
4aa6e6797dbe/parents""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""version-history""
href=""http://cmisexample.oasis-open.org/rep1/6cce57fc-4e31-491c-8fab-
4aa6e6797dbe/allversions""/>
    <atom:link type=""application/atom+xml;type=entry"" rel=""current-
version"" href=""http://cmisexample.oasis-open.org/rep1/6cce57fc-4e31-491c-
8fab-4aa6e6797dbe/latest""/>
    <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/relationships""
href=""http://cmisexample.oasis-open.org/rep1/6cce57fc-4e31-491c-8fab-
4aa6e6797dbe/relationships""/>
    <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/policies""
href=""http://cmisexample.oasis-open.org/rep1/6cce57fc-4e31-491c-8fab-
4aa6e6797dbe/policies""/>
    <atom:link type=""application/cmisacl+xml"" rel=""http://docs.oasis-
open.org/ns/cmis/link/200908/acl"" href=""http://cmisexample.oasis-
open.org/rep1/6cce57fc-4e31-491c-8fab-4aa6e6797dbe/acl""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""working-copy""
href=""http://cmisexample.oasis-open.org/rep1/6cce57fc-4e31-491c-8fab-
4aa6e6797dbe/pwc""/>
    <cmisra:object>
        <cmis:properties>
            <cmis:propertyId localName=""rep-cmis:objectId""
propertyDefinitionId=""cmis:objectId"">
                <cmis:value>6cce57fc-4e31-491c-8fab-4aa6e6797dbe</cmis:value>
            </cmis:propertyId>
            <cmis:propertyId localName=""rep-cmis:objectTypeId""
propertyDefinitionId=""cmis:objectTypeId"">
                <cmis:value>customer</cmis:value>
            </cmis:propertyId>
            <cmis:propertyString localName=""rep-cmis:name""
propertyDefinitionId=""cmis:name"">
                <cmis:value>CMIS Example Child of Folder</cmis:value>
            </cmis:propertyString>
            <cmis:propertyDateTime localName=""rep-cmis:creationDate""
propertyDefinitionId=""cmis:creationDate"">
                <cmis:value>2010-01-25T10:21:00.396-08:00</cmis:value>
            </cmis:propertyDateTime>
            <cmis:propertyDateTime localName=""rep-cmis:lastModificationDate""
propertyDefinitionId=""cmis:lastModificationDate"">
                <cmis:value>2010-01-25T10:21:00.396-08:00</cmis:value>
            </cmis:propertyDateTime>
            <cmis:propertyId localName=""rep-cmis:baseTypeId""
propertyDefinitionId=""cmis:baseTypeId"">
                <cmis:value>cmis:document</cmis:value>
            </cmis:propertyId>
            <cmis:propertyString localName=""rep-cmis:lastModifiedBy""
propertyDefinitionId=""cmis:lastModifiedBy"">
                <cmis:value>Al Brown</cmis:value>
            </cmis:propertyString>
            <cmis:propertyString localName=""rep-cmis:createdBy""
propertyDefinitionId=""cmis:createdBy"">
```

```
                <cmis:value>Al Brown</cmis:value>
            </cmis:propertyString>
            <cmis:propertyBoolean localName=~~"~~"rep-cmis:isLatestVersion~~"~~"
propertyDefinitionId=~~"~~"cmis:isLatestVersion~~"~~">
                <cmis:value>true</cmis:value>
            </cmis:propertyBoolean>
            <cmis:propertyBoolean localName=~~"~~"rep-
cmis:isVersionSeriesCheckedOut~~"~~"
propertyDefinitionId=~~"~~"cmis:isVersionSeriesCheckedOut~~"~~">
                <cmis:value>true</cmis:value>
            </cmis:propertyBoolean>
            <cmis:propertyBoolean localName=~~"~~"rep-cmis:isMajorVersion~~"~~"
propertyDefinitionId=~~"~~"cmis:isMajorVersion~~"~~">
                <cmis:value>false</cmis:value>
            </cmis:propertyBoolean>
            <cmis:propertyBoolean localName=~~"~~"rep-cmis:isLatestMajorVersion~~"~~"
propertyDefinitionId=~~"~~"cmis:isLatestMajorVersion~~"~~">
                <cmis:value>false</cmis:value>
            </cmis:propertyBoolean>
            <cmis:propertyBoolean localName=~~"~~"rep-cmis:isImmutable~~"~~"
propertyDefinitionId=~~"~~"cmis:isImmutable~~"~~">
                <cmis:value>false</cmis:value>
            </cmis:propertyBoolean>
            <cmis:propertyString localName=~~"~~"rep-cmis:checkinComment~~"~~"
propertyDefinitionId=~~"~~"cmis:checkinComment~~"~~">
                <cmis:value>Checkin comment</cmis:value>
            </cmis:propertyString>
            <cmis:propertyString localName=~~"~~"rep-cmis:versionLabel~~"~~"
propertyDefinitionId=~~"~~"cmis:versionLabel~~"~~">
                <cmis:value>0.1</cmis:value>
            </cmis:propertyString>
            <cmis:propertyString localName=~~"~~"rep-cmis:contentStreamMimeType~~"~~"
propertyDefinitionId=~~"~~"cmis:contentStreamMimeType~~"~~">
                <cmis:value>text/plain</cmis:value>
            </cmis:propertyString>
            <cmis:propertyString localName=~~"~~"rep-cmis:contentStreamFileName~~"~~"
propertyDefinitionId=~~"~~"cmis:contentStreamFileName~~"~~">
                <cmis:value>text.txt</cmis:value>
            </cmis:propertyString>
            <cmis:propertyInteger localName=~~"~~"rep-cmis:contentStreamLength~~"~~"
propertyDefinitionId=~~"~~"cmis:contentStreamLength~~"~~">
                <cmis:value>4234</cmis:value>
            </cmis:propertyInteger>
            <cmis:propertyString displayName=~~"~~"Keywords for Document~~"~~"
localName=~~"~~"keywords~~"~~" propertyDefinitionId=~~"~~"keywords~~"~~">
                <cmis:value>document</cmis:value>
                <cmis:value>example</cmis:value>
                <cmis:value>sample</cmis:value>
                <cmis:value>cmis</cmis:value>
            </cmis:propertyString>
            <cmis:propertyId localName=~~"~~"rep-cmis:versionSeriesCheckedOutId~~"~~"
propertyDefinitionId=~~"~~"cmis:versionSeriesCheckedOutId~~"~~">
                <cmis:value>6cce57fc-4e31-491c-8fab-4aa6e6797dbe</cmis:value>
            </cmis:propertyId>
            <cmis:propertyString localName=~~"~~"rep-
cmis:versionSeriesCheckedOutBy~~"~~"
propertyDefinitionId=~~"~~"cmis:versionSeriesCheckedOutBy~~"~~">
                <cmis:value>Al Brown</cmis:value>
            </cmis:propertyString>
        </cmis:properties>
    </cmisra:object>
</atom:entry>
```

Please also see the example documents included with the schema.

3.7.4 Unfiled Collection

This is a collection described in the service document that contains all the unfiled documents in the repository. This collection MUST be available if un-filing or multi-filing is supported by the repository.

A repository that supports un-filing MAY provide read access (GET). If read access is not provided, the repository SHOULD respond to a read attempt with the HTTP status code 405 (notSupported).

CMIS Services:

POST: removeObjectFromFolder

Media Type: application/atom+xml;type=feed

Accept:

- MUST support Atom Entry Documents with CMIS extensions
  - application/atom+xml;type=entry or
  - application/cmisatom+xml
- MAY support other media type

Link Relations:

- service: Points to service document containing the CMIS repository. The service document MUST contain only one workspace element.
  - Media Type: application/atomsvc+xml
- paging link relations as appropriate: first, next, previous, last

The following CMIS Atom extension element MAY be included inside the atom feed:

- cmisra:numItems

The following CMIS Atom extension element MUST be included inside the atom entries:

- cmisra:object inside atom:entry

3.7.4.1 POST

This removes the object from all folders in the repository by default. If the optional argument removeFrom is specified, the object will only be removed from that folder only.

If the Atom Entry POST~~’~~'ed, does not have the CMIS extensions with a valid cmis:objectId property, the document does not exist, or the document is not in that folder, the appropriate HTTP status code MUST be returned.

This adheres to AtomPub model. Please see http://tools.ietf.org/html/rfc5023#section-5.3.

- HTTP Success: 201
- Location Header

The following arguments may be supplied. Please see the domain model for more information:

- removeFrom: For repositories which support multi-filing, this parameter identifies which folder to remove this object from. If specified, it indicates the folder from which the object shall be moved. If not specified, the object will be removed from all folders.

Example client request:

```
POST /Unfiled HTTP/1.1
Host: example.org
Content-Length: 1043
Content-Type: application/atom+xml;type=entry


<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<atom:entry xmlns:app=""http://www.w3.org/2007/app""
xmlns:atom=""http://www.w3.org/2005/Atom"" xmlns:cmis=""http://docs.oasis-
open.org/ns/cmis/core/200908/"" xmlns:cmism=""http://docs.oasis-
open.org/ns/cmis/messaging/200908/"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:author>
        <atom:name>Al Brown</atom:name>
    </atom:author>
    <atom:content src=""http://cmisexample.oasis-open.org/rep1/12aa2bec-6f43-
47d1-99ef-21797867173c""/>
    <atom:id>urn:uuid:12aa2bec-6f43-47d1-99ef-21797867173c</atom:id>
    <atom:title type=""text"">CMIS Example Document to unfiled</atom:title>
    <atom:updated>2010-01-25T10:21:00.427-08:00</atom:updated>
    <cmisra:object>
        <cmis:properties>
            <cmis:propertyId localName=""rep-cmis:objectId""
propertyDefinitionId=""cmis:objectId"">
                <cmis:value>12aa2bec-6f43-47d1-99ef-21797867173c</cmis:value>
            </cmis:propertyId>
        </cmis:properties>
    </cmisra:object>
</atom:entry>
```

Example server response:

```
HTTP/1.1 201 Created
Date: Mon, 25 Jan 2010 10:21:00 -0800
Content-Length: 7234
Content-Type: application/atom+xml;type=entry
Content-Location: http://cmisexample.oasis-open.org/rep1/queryresult/15118373-
8911-442b-9774-da3b102f224c
Location: http://cmisexample.oasis-open.org/rep1/queryresult/15118373-8911-
442b-9774-da3b102f224c


<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<atom:entry xmlns:app=""http://www.w3.org/2007/app""
xmlns:atom=""http://www.w3.org/2005/Atom"" xmlns:cmis=""http://docs.oasis-
open.org/ns/cmis/core/200908/"" xmlns:cmism=""http://docs.oasis-
open.org/ns/cmis/messaging/200908/"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:author>
        <atom:name>Al Brown</atom:name>
        <atom:uri>http://www.ibm.com/</atom:uri>
        <atom:email>albertcbrown@us.ibm.com</atom:email>
    </atom:author>
    <atom:content src=""http://cmisexample.oasis-open.org/rep1/15118373-8911-
442b-9774-da3b102f224c""/>
    <atom:id>urn:uuid:15118373-8911-442b-9774-da3b102f224c</atom:id>
    <atom:title type=""text"">CMIS Example Document to unfiled</atom:title>
    <atom:updated>2010-01-25T10:21:00.443-08:00</atom:updated>
    <atom:link rel=""self"" href=""http://cmisexample.oasis-
open.org/rep1/15118373-8911-442b-9774-da3b102f224c""/>
    <atom:link rel=""edit"" href=""http://cmisexample.oasis-
open.org/rep1/15118373-8911-442b-9774-da3b102f224c""/>
    <atom:link type=""application/cmis+xml;type=allowableActions""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/allowableactions""
href=""http://cmisexample.oasis-open.org/rep1/15118373-8911-442b-9774-
da3b102f224c/allowableactions""/>
    <atom:link type=""application/atom+xml;type=entry"" rel=""describedby""
href=""http://cmisexample.oasis-open.org/rep1/15118373-8911-442b-9774-
da3b102f224c/type""/>
    <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
    <atom:published>2010-01-25T10:21:00.443-08:00</atom:published>
    <atom:summary type=""html"">HTML summary of Entry  15118373-8911-442b-
9774-da3b102f224c</atom:summary>
    <atom:link rel=""edit-media"" href=""http://cmisexample.oasis-
open.org/rep1/15118373-8911-442b-9774-da3b102f224c/edit-media""/>
    <atom:link rel=""alternate"" href=""http://cmisexample.oasis-
open.org/rep1/15118373-8911-442b-9774-da3b102f224c/alternate""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""up""
href=""http://cmisexample.oasis-open.org/rep1/15118373-8911-442b-9774-
da3b102f224c/parents""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""version-history""
href=""http://cmisexample.oasis-open.org/rep1/15118373-8911-442b-9774-
da3b102f224c/allversions""/>
    <atom:link type=""application/atom+xml;type=entry"" rel=""current-
version"" href=""http://cmisexample.oasis-open.org/rep1/15118373-8911-442b-
9774-da3b102f224c/latest""/>
    <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/relationships""
href=""http://cmisexample.oasis-open.org/rep1/15118373-8911-442b-9774-
da3b102f224c/relationships""/>
    <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/policies""
href=""http://cmisexample.oasis-open.org/rep1/15118373-8911-442b-9774-
da3b102f224c/policies""/>
    <atom:link type=""application/cmisacl+xml"" rel=""http://docs.oasis-
open.org/ns/cmis/link/200908/acl"" href=""http://cmisexample.oasis-
open.org/rep1/15118373-8911-442b-9774-da3b102f224c/acl""/>
    <cmisra:object>
        <cmis:properties>
            <cmis:propertyId localName=""rep-cmis:objectId""
propertyDefinitionId=""cmis:objectId"">
                <cmis:value>15118373-8911-442b-9774-da3b102f224c</cmis:value>
            </cmis:propertyId>
            <cmis:propertyId localName=""rep-cmis:objectTypeId""
propertyDefinitionId=""cmis:objectTypeId"">
                <cmis:value>customer</cmis:value>
            </cmis:propertyId>
            <cmis:propertyString localName=""rep-cmis:name""
propertyDefinitionId=""cmis:name"">
                <cmis:value>CMIS Example Document to unfiled</cmis:value>
            </cmis:propertyString>
            <cmis:propertyDateTime localName=""rep-cmis:creationDate""
propertyDefinitionId=""cmis:creationDate"">
                <cmis:value>2010-01-25T10:21:00.443-08:00</cmis:value>
            </cmis:propertyDateTime>
            <cmis:propertyDateTime localName=""rep-cmis:lastModificationDate""
propertyDefinitionId=""cmis:lastModificationDate"">
                <cmis:value>2010-01-25T10:21:00.443-08:00</cmis:value>
            </cmis:propertyDateTime>
            <cmis:propertyId localName=~~"~~"rep-cmis:baseTypeId~~"~~"
propertyDefinitionId=~~"~~"cmis:baseTypeId~~"~~">
                <cmis:value>cmis:document</cmis:value>
            </cmis:propertyId>
            <cmis:propertyString localName=~~"~~"rep-cmis:lastModifiedBy~~"~~"
propertyDefinitionId=~~"~~"cmis:lastModifiedBy~~"~~">
                <cmis:value>Al Brown</cmis:value>
            </cmis:propertyString>
            <cmis:propertyString localName=~~"~~"rep-cmis:createdBy~~"~~"
propertyDefinitionId=~~"~~"cmis:createdBy~~"~~">
                <cmis:value>Al Brown</cmis:value>
            </cmis:propertyString>
            <cmis:propertyBoolean localName=~~"~~"rep-cmis:isLatestVersion~~"~~"
propertyDefinitionId=~~"~~"cmis:isLatestVersion~~"~~">
                <cmis:value>true</cmis:value>
            </cmis:propertyBoolean>
            <cmis:propertyBoolean localName=~~"~~"rep-
cmis:isVersionSeriesCheckedOut~~"~~"
propertyDefinitionId=~~"~~"cmis:isVersionSeriesCheckedOut~~"~~">
                <cmis:value>false</cmis:value>
            </cmis:propertyBoolean>
            <cmis:propertyBoolean localName=~~"~~"rep-cmis:isMajorVersion~~"~~"
propertyDefinitionId=~~"~~"cmis:isMajorVersion~~"~~">
                <cmis:value>false</cmis:value>
            </cmis:propertyBoolean>
            <cmis:propertyBoolean localName=~~"~~"rep-cmis:isLatestMajorVersion~~"~~"
propertyDefinitionId=~~"~~"cmis:isLatestMajorVersion~~"~~">
                <cmis:value>false</cmis:value>
            </cmis:propertyBoolean>
            <cmis:propertyBoolean localName=~~"~~"rep-cmis:isImmutable~~"~~"
propertyDefinitionId=~~"~~"cmis:isImmutable~~"~~">
                <cmis:value>false</cmis:value>
            </cmis:propertyBoolean>
            <cmis:propertyString localName=~~"~~"rep-cmis:checkinComment~~"~~"
propertyDefinitionId=~~"~~"cmis:checkinComment~~"~~">
                <cmis:value>Checkin comment</cmis:value>
            </cmis:propertyString>
            <cmis:propertyString localName=~~"~~"rep-cmis:versionLabel~~"~~"
propertyDefinitionId=~~"~~"cmis:versionLabel~~"~~">
                <cmis:value>0.1</cmis:value>
            </cmis:propertyString>
            <cmis:propertyString localName=~~"~~"rep-cmis:contentStreamMimeType~~"~~"
propertyDefinitionId=~~"~~"cmis:contentStreamMimeType~~"~~">
                <cmis:value>text/plain</cmis:value>
            </cmis:propertyString>
            <cmis:propertyString localName=~~"~~"rep-cmis:contentStreamFileName~~"~~"
propertyDefinitionId=~~"~~"cmis:contentStreamFileName~~"~~">
                <cmis:value>text.txt</cmis:value>
            </cmis:propertyString>
            <cmis:propertyInteger localName=~~"~~"rep-cmis:contentStreamLength~~"~~"
propertyDefinitionId=~~"~~"cmis:contentStreamLength~~"~~">
                <cmis:value>4234</cmis:value>
            </cmis:propertyInteger>
            <cmis:propertyString displayName=~~"~~"Keywords for Document~~"~~"
localName=~~"~~"keywords~~"~~" propertyDefinitionId=~~"~~"keywords~~"~~">
                <cmis:value>document</cmis:value>
                <cmis:value>example</cmis:value>
                <cmis:value>sample</cmis:value>
                <cmis:value>cmis</cmis:value>
            </cmis:propertyString>
        </cmis:properties>
    </cmisra:object>
</atom:entry>
```

Please also see the example documents included with the schema.

3.7.5 Types Children Collection

This is a collection described in the service document that contains the types in the repository under the specified parent type. If no parent type is specified, then the base types are returned in the feed. This feed does not include any nesting and is a flat feed.

CMIS Services:

GET: getTypeChildren

Media Type: application/atom+xml;type=feed

Link Relations:

- service: Points to service document containing the CMIS repository. The service document MUST contain only one workspace element.
    - Media Type: application/atomsvc+xml
- via: points to the type definition entry whose children represent this feed
- down: points to the atom feed document representing the descendents collection for this same type with media type of application/cmistree+xml
- paging link relations as appropriate: first, next, previous, last
- up: points to the parent type definition
    - If this is a children feed for a base object type, this link is not present.

This feed contains a set of atom entries for each child type definition.

The following CMIS Atom extension element MAY be included inside the atom feed:

- cmisra:numItems

The following CMIS Atom extension element MUST be included inside the atom entries:

- cmisra:type inside atom:entry

3.7.5.1 GET

The following arguments may be supplied. Please see the domain model for more information:

- includePropertyDefinitions
- maxItems
- skipCount
- typeId

3.8 Collections

For any HTTP verb not specified on a resource,each implementation MAY chose to implement that HTTP verb in a repository-specific manner.

3.8.1 Relationships Collection

This is the set of relationships available (either source or target or both) from a specific item such as a document, folder or policy.

CMIS Services:

GET: getObjectRelationships

POST: createRelationship

Media Type: application/atom+xml;type=feed

Accept:

- MUST support Atom Entry Documents with CMIS extensions
  - application/atom+xml;type=entry or
  - application/cmisatom+xml
- MAY support other media type

Link Relations:

- service: Points to service document containing the CMIS repository. The service document MUST contain only one workspace element.
  - Media Type: application/atomsvc+xml
- paging link relations as appropriate: first, next, previous, last

The following CMIS Atom extension element MAY be included inside the atom feed:

- cmisra:numItems

The following CMIS Atom extension element MUST be included inside the atom entries:

- cmisra:object inside atom:entry

3.8.1.1 GET

The following arguments may be supplied. Please see the domain model for more information:

- typeId
- includeSubRelationshipTypes
- relationshipDirection
- maxItems
- skipCount
- filter
- includeAllowableActions

3.8.1.2 POST

When an atom entry with CMIS markup is posted to this collection, if that atom entry represents a new CMIS relationship, then that relationship will be created.

The server MUST return the appropriate HTTP status code if the source is different than the sourceId or target different than the targetId for the source and targets specified in this collection.

The server MUST return the appropriate status code if the cmis:objectTypeId is not specified.

Example client request:

```
POST /relationships/source/dbf0316c-47b5-47c9-a2fa-f005eb93f0a4 HTTP/1.1
Host: example.org
Content-Length: 1432
Content-Type: application/atom+xml;type=entry


<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<atom:entry xmlns:app=""http://www.w3.org/2007/app""
xmlns:atom=""http://www.w3.org/2005/Atom"" xmlns:cmis=""http://docs.oasis-
open.org/ns/cmis/core/200908/"" xmlns:cmism=""http://docs.oasis-
open.org/ns/cmis/messaging/200908/"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:author>
        <atom:name>Al Brown</atom:name>
    </atom:author>
    <atom:content src=""http://cmisexample.oasis-open.org/rep1/dab97641-8c94-
4a12-a604-7532980f05cb""/>
    <atom:id>urn:uuid:dab97641-8c94-4a12-a604-7532980f05cb</atom:id>
    <atom:title type=""text"">New Relationship</atom:title>
    <atom:updated>2010-01-25T10:20:58.864-08:00</atom:updated>
    <cmisra:object>
        <cmis:properties>
            <cmis:propertyId localName=""rep-cmis:objectTypeId""
propertyDefinitionId=""cmis:objectTypeId"">
                <cmis:value>customerRelationships</cmis:value>
            </cmis:propertyId>
            <cmis:propertyId localName=""rep-cmis:sourceId""
propertyDefinitionId=""cmis:sourceId"">
                <cmis:value>dbf0316c-47b5-47c9-a2fa-f005eb93f0a4</cmis:value>
            </cmis:propertyId>
            <cmis:propertyId localName=""rep-cmis:targetId""
propertyDefinitionId=""cmis:targetId"">
                <cmis:value>b9baac7d-7584-445e-bcd1-29af9b25bf2f</cmis:value>
            </cmis:propertyId>
        </cmis:properties>
    </cmisra:object>
</atom:entry>
```

Example server response:

```
HTTP/1.1 201 Created
Date: Mon, 25 Jan 2010 10:20:58 -0800
Content-Length: 4684
Content-Type: application/atom+xml;type=entry
Content-Location: http://cmisexample.oasis-open.org/rep1/b3006a8f-345b-4c27-
86df-3f4b157bb495
Location: http://cmisexample.oasis-open.org/rep1/b3006a8f-345b-4c27-86df-
3f4b157bb495


<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<atom:entry xmlns:app=""http://www.w3.org/2007/app""
xmlns:atom=""http://www.w3.org/2005/Atom"" xmlns:cmis=""http://docs.oasis-
open.org/ns/cmis/core/200908/"" xmlns:cmism=""http://docs.oasis-
open.org/ns/cmis/messaging/200908/"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:author>
        <atom:name>Al Brown</atom:name>
        <atom:uri>http://www.ibm.com/</atom:uri>
        <atom:email>albertcbrown@us.ibm.com</atom:email>
    </atom:author>
    <atom:content src=""http://cmisexample.oasis-open.org/rep1/b3006a8f-345b-
4c27-86df-3f4b157bb495""/>
    <atom:id>urn:uuid:b3006a8f-345b-4c27-86df-3f4b157bb495</atom:id>
    <atom:title type=""text"">New Relationship</atom:title>
    <atom:updated>2010-01-25T10:20:58.880-08:00</atom:updated>
    <atom:link rel=""self"" href=""http://cmisexample.oasis-
open.org/rep1/b3006a8f-345b-4c27-86df-3f4b157bb495""/>
    <atom:link rel=""edit"" href=""http://cmisexample.oasis-
open.org/rep1/b3006a8f-345b-4c27-86df-3f4b157bb495""/>
    <atom:link type=""application/cmis+xml;type=allowableActions""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/allowableactions""
href=""http://cmisexample.oasis-open.org/rep1/b3006a8f-345b-4c27-86df-
3f4b157bb495/allowableactions""/>
    <atom:link type=""application/atom+xml;type=entry"" rel=""describedby""
href=""http://cmisexample.oasis-open.org/rep1/b3006a8f-345b-4c27-86df-
3f4b157bb495/type""/>
    <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
    <atom:published>2010-01-25T10:20:58.880-08:00</atom:published>
    <atom:summary type=""html"">HTML summary of Entry  b3006a8f-345b-4c27-
86df-3f4b157bb495</atom:summary>
    <atom:link type=""application/atom+xml;type=entry""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/source""
href=""http://cmisexample.oasis-open.org/rep1/b3006a8f-345b-4c27-86df-
3f4b157bb495/source""/>
    <atom:link type=""application/atom+xml;type=entry""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/target""
href=""http://cmisexample.oasis-open.org/rep1/b3006a8f-345b-4c27-86df-
3f4b157bb495/target""/>
    <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/policies""
href=""http://cmisexample.oasis-open.org/rep1/b3006a8f-345b-4c27-86df-
3f4b157bb495/policies""/>
    <atom:link type=""application/cmisacl+xml"" rel=""http://docs.oasis-
open.org/ns/cmis/link/200908/acl"" href=""http://cmisexample.oasis-
open.org/rep1/b3006a8f-345b-4c27-86df-3f4b157bb495/acl""/>
    <cmisra:object>
        <cmis:properties>
            <cmis:propertyId localName=""rep-cmis:objectId""
propertyDefinitionId=""cmis:objectId"">
                <cmis:value>b3006a8f-345b-4c27-86df-3f4b157bb495</cmis:value>
            </cmis:propertyId>
            <cmis:propertyId localName=""rep-cmis:objectTypeId""
propertyDefinitionId=""cmis:objectTypeId"">
                <cmis:value>customerRelationships</cmis:value>
            </cmis:propertyId>
            <cmis:propertyString localName=""rep-cmis:name""
propertyDefinitionId=""cmis:name"">
                <cmis:value>New Relationship</cmis:value>
            </cmis:propertyString>
            <cmis:propertyDateTime localName=""rep-cmis:creationDate""
propertyDefinitionId=""cmis:creationDate"">
                <cmis:value>2010-01-25T10:20:58.880-08:00</cmis:value>
            </cmis:propertyDateTime>
            <cmis:propertyDateTime localName=""rep-cmis:lastModificationDate""
propertyDefinitionId=""cmis:lastModificationDate"">
                <cmis:value>2010-01-25T10:20:58.880-08:00</cmis:value>
            </cmis:propertyDateTime>
            <cmis:propertyId localName=""rep-cmis:baseTypeId""
propertyDefinitionId=""cmis:baseTypeId"">
                <cmis:value>cmis:relationship</cmis:value>
            </cmis:propertyId>
            <cmis:propertyString localName=""rep-cmis:lastModifiedBy""
propertyDefinitionId=""cmis:lastModifiedBy"">
```

```
                <cmis:value>Al Brown</cmis:value>
            </cmis:propertyString>
            <cmis:propertyString localName=""rep-cmis:createdBy""
propertyDefinitionId=""cmis:createdBy"">
                <cmis:value>Al Brown</cmis:value>
            </cmis:propertyString>
            <cmis:propertyId localName=""rep-cmis:sourceId""
propertyDefinitionId=""cmis:sourceId"">
                <cmis:value>d4551c6d-30bd-4fc2-9c84-a55f11559e89</cmis:value>
            </cmis:propertyId>
            <cmis:propertyId localName=""rep-cmis:targetId""
propertyDefinitionId=""cmis:targetId"">
                <cmis:value>fe7e056f-c4bf-42f1-a03e-3ababcf2491d</cmis:value>
            </cmis:propertyId>
        </cmis:properties>
    </cmisra:object>
</atom:entry>
```

Please also see the example documents included with the schema.

3.8.2 Folder Children Collection

This is a collection comprised of all the direct children of a particular folder represented as a feed.

CMIS Services:

GET: getChildren

POST:

createDocument

or createFolder

or createPolicy

or moveObject

or addObjectToFolder

Media Type: application/atom+xml;type=feed

Accept:

- MUST support Atom Entry Documents with CMIS extensions
- MAY support other media type

Link Relations:

- service: Points to service document containing the CMIS repository. The service document MUST contain only one workspace element.
  - Media Type: application/atomsvc+xml
- via: points to the atom entry of the folder generating this collection
- up: points to the atom entry document for this folder’'s parent
  - If the root folder, this link relation MUST NOT be included.
  - Media Type: application/atom+xml;type=entry
- down: points to the atom feed document representing the descendents feed with a media type of application/cmistree+xml

  - If a repository does not support capabilityGetDescendants, then this link SHOULD NOT be included.
- *http://docs.oasis-open.org/ns/cmis/link/200908/foldertree*: Points to the folder tree for this folder. This is represented as a feed with CMIS hierarchy extensions.
  - Media Type: application/atom+xml;type=feed
- paging link relations as appropriate: first, next, previous, last

The following CMIS Atom extension element MAY be included inside the atom feed:

- cmisra:numItems

The following CMIS Atom extension element MUST be included inside the atom entries:

- cmisra:object inside atom:entry
- cmisra:pathSegment inside atom:entry if pathSegment is not false

3.8.2.1 GET

HTTP Code:

- 200 OK (Success)

The following arguments may be supplied. Please see the domain model for more information:

- maxItems
- skipCount
- filter
- includeAllowableActions
- includeRelationships
- renditionFilter
  - If specified, renditions will be returned as links with relation alternate.
- orderBy
- includePathSegment

3.8.2.2 POST

CMIS repositories MUST be compliant with RFC5023 for POSTing new entries into a collection. Please see http://tools.ietf.org/html/rfc5023#section-5.3.

- HTTP Success: 201
- Location Header

The following arguments MAY be supplied.

- sourceFolderId: This parameter indicates the folder from which the object shall be moved from to the current specified folder. This parameter is not allowed for create operations.
  - If specified moveObject will be performed.
  - If not specified, addObjectToFolder will be performed.
- versioningState: The optional argument versioningState MAY specify additional versioning behavior such as checkIn as major or minor. Please see CMIS Domain Model for more information on this parameter.

POSTing an Atom Entry document with CMIS markup:

Adding a document to a folder:

If the atom entry has a cmis property cmis:objectId that is valid for the repository, the object will be added to the folder.

When an object is added to the folder, in repositories that do not support multi-filing it will be removed from the previous folder and the operation treated as move. If the repository supports multiple folders, it will be added to the new folder.

If the optional argument sourceFolderId is specified, then the object will be removed from the folder specified.

If atom:content is missing from the request, the repository MUST treat the missing atom:content element as an empty atom:content element.

Example client request:

```
POST /obj/1cd0d82f-d579-4897-9b0a-ad0917595445?sourceFolderId=313fd58d-2eab-
41af-9517-06dadb010d49 HTTP/1.1
Host: example.org
Content-Length: 1227
Content-Type: application/atom+xml;type=entry


<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<atom:entry xmlns:app=""http://www.w3.org/2007/app""
xmlns:atom=""http://www.w3.org/2005/Atom"" xmlns:cmis=""http://docs.oasis-
open.org/ns/cmis/core/200908/"" xmlns:cmism=""http://docs.oasis-
open.org/ns/cmis/messaging/200908/"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:author>
        <atom:name>Al Brown</atom:name>
    </atom:author>
    <atom:id>urn:uuid:1cd0d82f-d579-4897-9b0a-ad0917595445</atom:id>
    <atom:title type=""text"">Document - To Be Moved</atom:title>
    <atom:updated>2010-01-25T10:20:58.708-08:00</atom:updated>
    <atom:content src=""http://cmisexample.oasis-
open.org/rep1//content/1cd0d82f-d579-4897-9b0a-ad0917595445""/>
    <cmisra:object>
        <cmis:properties>
            <cmis:propertyId localName=""rep-cmis:objectId""
propertyDefinitionId=""cmis:objectId"">
                <cmis:value>1cd0d82f-d579-4897-9b0a-ad0917595445</cmis:value>
            </cmis:propertyId>
            <cmis:propertyId localName=""rep-cmis:objectTypeId""
propertyDefinitionId=""cmis:objectTypeId"">
                <cmis:value>invoice</cmis:value>
            </cmis:propertyId>
        </cmis:properties>
    </cmisra:object>
</atom:entry>
```

Example server response:

```
HTTP/1.1 201 Created
Date: Mon, 25 Jan 2010 10:20:58 -0800
Content-Length: 7213
Content-Type: application/atom+xml;type=entry
Content-Location: http://cmisexample.oasis-open.org/rep1/b4423b8a-e46e-49fb-
8141-4aed91d28b5b
Location: http://cmisexample.oasis-open.org/rep1/b4423b8a-e46e-49fb-8141-
4aed91d28b5b
```

```


<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<atom:entry xmlns:app=""http://www.w3.org/2007/app""
xmlns:atom=""http://www.w3.org/2005/Atom"" xmlns:cmis=""http://docs.oasis-
open.org/ns/cmis/core/200908/"" xmlns:cmism=""http://docs.oasis-
open.org/ns/cmis/messaging/200908/"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:author>
        <atom:name>Al Brown</atom:name>
        <atom:uri>http://www.ibm.com/</atom:uri>
        <atom:email>albertcbrown@us.ibm.com</atom:email>
    </atom:author>
    <atom:content src=""http://cmisexample.oasis-open.org/rep1/b4423b8a-e46e-
49fb-8141-4aed91d28b5b""/>
    <atom:id>urn:uuid:b4423b8a-e46e-49fb-8141-4aed91d28b5b</atom:id>
    <atom:title type=""text"">Document - To Be Moved</atom:title>
    <atom:updated>2010-01-25T10:20:58.786-08:00</atom:updated>
    <atom:link rel=""self"" href=""http://cmisexample.oasis-
open.org/rep1/b4423b8a-e46e-49fb-8141-4aed91d28b5b""/>
    <atom:link rel=""edit"" href=""http://cmisexample.oasis-
open.org/rep1/b4423b8a-e46e-49fb-8141-4aed91d28b5b""/>
    <atom:link type=""application/cmis+xml;type=allowableActions""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/allowableactions""
href=""http://cmisexample.oasis-open.org/rep1/b4423b8a-e46e-49fb-8141-
4aed91d28b5b/allowableactions""/>
    <atom:link type=""application/atom+xml;type=entry"" rel=""describedby""
href=""http://cmisexample.oasis-open.org/rep1/b4423b8a-e46e-49fb-8141-
4aed91d28b5b/type""/>
    <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
    <atom:published>2010-01-25T10:20:58.786-08:00</atom:published>
    <atom:summary type=""html"">HTML summary of Entry  b4423b8a-e46e-49fb-
8141-4aed91d28b5b</atom:summary>
    <atom:link rel=""edit-media"" href=""http://cmisexample.oasis-
open.org/rep1/b4423b8a-e46e-49fb-8141-4aed91d28b5b/edit-media""/>
    <atom:link rel=""alternate"" href=""http://cmisexample.oasis-
open.org/rep1/b4423b8a-e46e-49fb-8141-4aed91d28b5b/alternate""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""up""
href=""http://cmisexample.oasis-open.org/rep1/b4423b8a-e46e-49fb-8141-
4aed91d28b5b/parents""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""version-history""
href=""http://cmisexample.oasis-open.org/rep1/b4423b8a-e46e-49fb-8141-
4aed91d28b5b/allversions""/>
    <atom:link type=""application/atom+xml;type=entry"" rel=""current-
version"" href=""http://cmisexample.oasis-open.org/rep1/b4423b8a-e46e-49fb-
8141-4aed91d28b5b/latest""/>
    <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/relationships""
href=""http://cmisexample.oasis-open.org/rep1/b4423b8a-e46e-49fb-8141-
4aed91d28b5b/relationships""/>
    <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/policies""
href=""http://cmisexample.oasis-open.org/rep1/b4423b8a-e46e-49fb-8141-
4aed91d28b5b/policies""/>
    <atom:link type=""application/cmisacl+xml"" rel=""http://docs.oasis-
open.org/ns/cmis/link/200908/acl"" href=""http://cmisexample.oasis-
open.org/rep1/b4423b8a-e46e-49fb-8141-4aed91d28b5b/acl""/>
    <cmisra:object>
        <cmis:properties>
            <cmis:propertyId localName=""rep-cmis:objectId""
propertyDefinitionId=""cmis:objectId"">
                <cmis:value>b4423b8a-e46e-49fb-8141-4aed91d28b5b</cmis:value>
            </cmis:propertyId>
            <cmis:propertyId localName=""rep-cmis:objectTypeId""
propertyDefinitionId=""cmis:objectTypeId"">
                <cmis:value>invoice</cmis:value>
            </cmis:propertyId>
            <cmis:propertyString localName=""rep-cmis:name""
propertyDefinitionId=""cmis:name"">
                <cmis:value>Document - To Be Moved</cmis:value>
            </cmis:propertyString>
            <cmis:propertyDateTime localName=""rep-cmis:creationDate""
propertyDefinitionId=""cmis:creationDate"">
                <cmis:value>2010-01-25T10:20:58.786-08:00</cmis:value>
            </cmis:propertyDateTime>
            <cmis:propertyDateTime localName=""rep-cmis:lastModificationDate""
propertyDefinitionId=""cmis:lastModificationDate"">
                <cmis:value>2010-01-25T10:20:58.786-08:00</cmis:value>
            </cmis:propertyDateTime>
            <cmis:propertyId localName=""rep-cmis:baseTypeId""
propertyDefinitionId=""cmis:baseTypeId"">
                <cmis:value>cmis:document</cmis:value>
            </cmis:propertyId>
            <cmis:propertyString localName=""rep-cmis:lastModifiedBy""
propertyDefinitionId=""cmis:lastModifiedBy"">
                <cmis:value>Al Brown</cmis:value>
            </cmis:propertyString>
            <cmis:propertyString localName=""rep-cmis:createdBy""
propertyDefinitionId=""cmis:createdBy"">
                <cmis:value>Al Brown</cmis:value>
            </cmis:propertyString>
            <cmis:propertyBoolean localName=""rep-cmis:isLatestVersion""
propertyDefinitionId=""cmis:isLatestVersion"">
                <cmis:value>true</cmis:value>
            </cmis:propertyBoolean>
            <cmis:propertyBoolean localName=""rep-
cmis:isVersionSeriesCheckedOut""
propertyDefinitionId=""cmis:isVersionSeriesCheckedOut"">
                <cmis:value>false</cmis:value>
            </cmis:propertyBoolean>
            <cmis:propertyBoolean localName=""rep-cmis:isMajorVersion""
propertyDefinitionId=""cmis:isMajorVersion"">
                <cmis:value>false</cmis:value>
            </cmis:propertyBoolean>
            <cmis:propertyBoolean localName=""rep-cmis:isLatestMajorVersion""
propertyDefinitionId=""cmis:isLatestMajorVersion"">
                <cmis:value>false</cmis:value>
            </cmis:propertyBoolean>
            <cmis:propertyBoolean localName=""rep-cmis:isImmutable""
propertyDefinitionId=""cmis:isImmutable"">
                <cmis:value>false</cmis:value>
            </cmis:propertyBoolean>
            <cmis:propertyString localName=""rep-cmis:checkinComment""
propertyDefinitionId=""cmis:checkinComment"">
                <cmis:value>Checkin comment</cmis:value>
            </cmis:propertyString>
            <cmis:propertyString localName=""rep-cmis:versionLabel""
propertyDefinitionId=""cmis:versionLabel"">
                <cmis:value>0.1</cmis:value>
            </cmis:propertyString>
            <cmis:propertyString localName=""rep-cmis:contentStreamMimeType""
propertyDefinitionId=""cmis:contentStreamMimeType"">
                <cmis:value>text/plain</cmis:value>
            </cmis:propertyString>
            <cmis:propertyString localName=""rep-cmis:contentStreamFileName""
propertyDefinitionId=""cmis:contentStreamFileName"">
                <cmis:value>text.txt</cmis:value>
            </cmis:propertyString>
            <cmis:propertyInteger localName=""rep-cmis:contentStreamLength""
propertyDefinitionId=""cmis:contentStreamLength"">
                <cmis:value>4234</cmis:value>
            </cmis:propertyInteger>
            <cmis:propertyString displayName=""Keywords for Document""
localName=""keywords"" propertyDefinitionId=""keywords"">
                <cmis:value>document</cmis:value>
                <cmis:value>example</cmis:value>
                <cmis:value>sample</cmis:value>
                <cmis:value>cmis</cmis:value>
            </cmis:propertyString>
        </cmis:properties>
    </cmisra:object>
</atom:entry>

```

Please also see the example documents included with the schema.

Creating a CMIS Object (in that folder):

If the cmis:objectId property is missing, the object will be created and then added to the folder. If the cmis:objectId property is present but not a valid object Id, the repository MUST return the appropriate HTTP status code.

For Documents:

If Content Stream is not provided and it is required by the type definition, the repository MUST return the appropriate HTTP status code.

Content Streams MAY be provided by any of the following mechanisms:

- As part of the atom entry via the src attribute on the content element (AtomPub)
  - src attribute: Implementers MAY support external references to content
  - If the URI in the src attribute is not reachable, then an appropriate http status code should be returned.
- As part of the atom entry inlining via the content element (AtomPub)
  - Please see the AtomPub specification RFC5023 for the processing model of the content element.
- If the cmisra:content is provided by the client inside the atom:entry, the cmisra:content element MUST take precendence over the atom:content element. (CMIS)
  - This element cmisra:content is base64 encoded
- At a later time (AtomPub)
  - At a later time by replacing the edit-media link with a new content

The optional argument versioningState MAY specify additional versioning behavior such as checkin.

Example client request:

```
POST /obj/bb2b208b-3acd-4abe-9788-8078a239f228 HTTP/1.1
Host: example.org
Content-Length: 1190
Content-Type: application/atom+xml;type=entry
```

```
<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<atom:entry xmlns:app=""http://www.w3.org/2007/app""
xmlns:atom=""http://www.w3.org/2005/Atom"" xmlns:cmis=""http://docs.oasis-
open.org/ns/cmis/core/200908/"" xmlns:cmism=""http://docs.oasis-
open.org/ns/cmis/messaging/200908/"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:author>
        <atom:name>Al Brown</atom:name>
    </atom:author>
    <atom:id>urn:uuid:bb2b208b-3acd-4abe-9788-8078a239f228</atom:id>
    <atom:title type=""text"">New Invoice</atom:title>
    <atom:updated>2010-01-25T10:20:58.818-08:00</atom:updated>
    <atom:content type=""text"">this is the content of the new
document</atom:content>
    <cmisra:object>
        <cmis:properties>
            <cmis:propertyId localName=""rep-cmis:objectId""
propertyDefinitionId=""cmis:objectId"">
                <cmis:value>bb2b208b-3acd-4abe-9788-8078a239f228</cmis:value>
            </cmis:propertyId>
            <cmis:propertyId localName=""rep-cmis:objectTypeId""
propertyDefinitionId=""cmis:objectTypeId"">
                <cmis:value>invoice</cmis:value>
            </cmis:propertyId>
        </cmis:properties>
    </cmisra:object>
</atom:entry>
```

Example server response:

```
HTTP/1.1 201 Created
Date: Mon, 25 Jan 2010 10:20:58 -0800
Content-Length: 7191
Content-Type: application/atom+xml;type=entry
Content-Location: http://cmisexample.oasis-open.org/rep1/13475008-6a20-4454-
ad0b-10ea94c4b93d
Location: http://cmisexample.oasis-open.org/rep1/13475008-6a20-4454-ad0b-
10ea94c4b93d


<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<atom:entry xmlns:app=""http://www.w3.org/2007/app""
xmlns:atom=""http://www.w3.org/2005/Atom"" xmlns:cmis=""http://docs.oasis-
open.org/ns/cmis/core/200908/"" xmlns:cmism=""http://docs.oasis-
open.org/ns/cmis/messaging/200908/"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:author>
        <atom:name>Al Brown</atom:name>
        <atom:uri>http://www.ibm.com/</atom:uri>
        <atom:email>albertcbrown@us.ibm.com</atom:email>
    </atom:author>
    <atom:content src=""http://cmisexample.oasis-open.org/rep1/13475008-6a20-
4454-ad0b-10ea94c4b93d""/>
    <atom:id>urn:uuid:13475008-6a20-4454-ad0b-10ea94c4b93d</atom:id>
    <atom:title type=""text"">New Invoice</atom:title>
    <atom:updated>2010-01-25T10:20:58.818-08:00</atom:updated>
    <atom:link rel=""self"" href=""http://cmisexample.oasis-
open.org/rep1/13475008-6a20-4454-ad0b-10ea94c4b93d""/>
    <atom:link rel=""edit"" href=""http://cmisexample.oasis-
open.org/rep1/13475008-6a20-4454-ad0b-10ea94c4b93d""/>
```

```
    <atom:link type=""application/cmis+xml;type=allowableActions""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/allowableactions""
href=""http://cmisexample.oasis-open.org/rep1/13475008-6a20-4454-ad0b-
10ea94c4b93d/allowableactions""/>
    <atom:link type=""application/atom+xml;type=entry"" rel=""describedby""
href=""http://cmisexample.oasis-open.org/rep1/13475008-6a20-4454-ad0b-
10ea94c4b93d/type""/>
    <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
    <atom:published>2010-01-25T10:20:58.833-08:00</atom:published>
    <atom:summary type=""html"">HTML summary of Entry  13475008-6a20-4454-
ad0b-10ea94c4b93d</atom:summary>
    <atom:link rel=""edit-media"" href=""http://cmisexample.oasis-
open.org/rep1/13475008-6a20-4454-ad0b-10ea94c4b93d/edit-media""/>
    <atom:link rel=""alternate"" href=""http://cmisexample.oasis-
open.org/rep1/13475008-6a20-4454-ad0b-10ea94c4b93d/alternate""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""up""
href=""http://cmisexample.oasis-open.org/rep1/13475008-6a20-4454-ad0b-
10ea94c4b93d/parents""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""version-history""
href=""http://cmisexample.oasis-open.org/rep1/13475008-6a20-4454-ad0b-
10ea94c4b93d/allversions""/>
    <atom:link type=""application/atom+xml;type=entry"" rel=""current-
version"" href=""http://cmisexample.oasis-open.org/rep1/13475008-6a20-4454-
ad0b-10ea94c4b93d/latest""/>
    <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/relationships""
href=""http://cmisexample.oasis-open.org/rep1/13475008-6a20-4454-ad0b-
10ea94c4b93d/relationships""/>
    <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/policies""
href=""http://cmisexample.oasis-open.org/rep1/13475008-6a20-4454-ad0b-
10ea94c4b93d/policies""/>
    <atom:link type=""application/cmisacl+xml"" rel=""http://docs.oasis-
open.org/ns/cmis/link/200908/acl"" href=""http://cmisexample.oasis-
open.org/rep1/13475008-6a20-4454-ad0b-10ea94c4b93d/acl""/>
    <cmisra:object>
        <cmis:properties>
            <cmis:propertyId localName=""rep-cmis:objectId""
propertyDefinitionId=""cmis:objectId"">
                <cmis:value>13475008-6a20-4454-ad0b-10ea94c4b93d</cmis:value>
            </cmis:propertyId>
            <cmis:propertyId localName=""rep-cmis:objectTypeId""
propertyDefinitionId=""cmis:objectTypeId"">
                <cmis:value>invoice</cmis:value>
            </cmis:propertyId>
            <cmis:propertyString localName=""rep-cmis:name""
propertyDefinitionId=""cmis:name"">
                <cmis:value>New Invoice</cmis:value>
            </cmis:propertyString>
            <cmis:propertyDateTime localName=""rep-cmis:creationDate""
propertyDefinitionId=""cmis:creationDate"">
                <cmis:value>2010-01-25T10:20:58.833-08:00</cmis:value>
            </cmis:propertyDateTime>
            <cmis:propertyDateTime localName=""rep-cmis:lastModificationDate""
propertyDefinitionId=""cmis:lastModificationDate"">
                <cmis:value>2010-01-25T10:20:58.833-08:00</cmis:value>
            </cmis:propertyDateTime>
            <cmis:propertyId localName=""rep-cmis:baseTypeId""
propertyDefinitionId=""cmis:baseTypeId"">
                <cmis:value>cmis:document</cmis:value>
            </cmis:propertyId>
            <cmis:propertyString localName=""rep-cmis:lastModifiedBy""
propertyDefinitionId=""cmis:lastModifiedBy"">
```

```
                <cmis:value>Al Brown</cmis:value>
            </cmis:propertyString>
            <cmis:propertyString localName=""rep-cmis:createdBy""
propertyDefinitionId=""cmis:createdBy"">
                <cmis:value>Al Brown</cmis:value>
            </cmis:propertyString>
            <cmis:propertyBoolean localName=""rep-cmis:isLatestVersion""
propertyDefinitionId=""cmis:isLatestVersion"">
                <cmis:value>true</cmis:value>
            </cmis:propertyBoolean>
            <cmis:propertyBoolean localName=""rep-
cmis:isVersionSeriesCheckedOut""
propertyDefinitionId=""cmis:isVersionSeriesCheckedOut"">
                <cmis:value>false</cmis:value>
            </cmis:propertyBoolean>
            <cmis:propertyBoolean localName=""rep-cmis:isMajorVersion""
propertyDefinitionId=""cmis:isMajorVersion"">
                <cmis:value>false</cmis:value>
            </cmis:propertyBoolean>
            <cmis:propertyBoolean localName=""rep-cmis:isLatestMajorVersion""
propertyDefinitionId=""cmis:isLatestMajorVersion"">
                <cmis:value>false</cmis:value>
            </cmis:propertyBoolean>
            <cmis:propertyBoolean localName=""rep-cmis:isImmutable""
propertyDefinitionId=""cmis:isImmutable"">
                <cmis:value>false</cmis:value>
            </cmis:propertyBoolean>
            <cmis:propertyString localName=""rep-cmis:checkinComment""
propertyDefinitionId=""cmis:checkinComment"">
                <cmis:value>Checkin comment</cmis:value>
            </cmis:propertyString>
            <cmis:propertyString localName=""rep-cmis:versionLabel""
propertyDefinitionId=""cmis:versionLabel"">
                <cmis:value>0.1</cmis:value>
            </cmis:propertyString>
            <cmis:propertyString localName=""rep-cmis:contentStreamMimeType""
propertyDefinitionId=""cmis:contentStreamMimeType"">
                <cmis:value>text/plain</cmis:value>
            </cmis:propertyString>
            <cmis:propertyString localName=""rep-cmis:contentStreamFileName""
propertyDefinitionId=""cmis:contentStreamFileName"">
                <cmis:value>text.txt</cmis:value>
            </cmis:propertyString>
            <cmis:propertyInteger localName=""rep-cmis:contentStreamLength""
propertyDefinitionId=""cmis:contentStreamLength"">
                <cmis:value>4234</cmis:value>
            </cmis:propertyInteger>
            <cmis:propertyString displayName=""Keywords for Document""
localName=""keywords"" propertyDefinitionId=""keywords"">
                <cmis:value>document</cmis:value>
                <cmis:value>example</cmis:value>
                <cmis:value>sample</cmis:value>
                <cmis:value>cmis</cmis:value>
            </cmis:propertyString>
        </cmis:properties>
    </cmisra:object>
</atom:entry>
```

Please also see the example documents included with the schema.

POSTing other document formats: (AtomPub)

The behavior is repository specific when a non Atom entry or an atom document without the CMIS elements is posted to a folder collection.

For example, the repository MAY auto-create a document with a specific type (document) the client could edit.

If the repository does not support this scenario or another exception occurs, then the repository MUST return the appropriate HTTP status code.

Optional arguments:

- versioningState (for createDocument)
- sourceFolderId (for moveObject)

3.8.3 Policies Collection

This is an atom feed of all the policy objects currently applied to a specific object. This is the only collection where the URI~~’~~'s of the objects in the collection MUST be specific to that collection. A DELETE on the policy object in the collection is a removal of the policy from the object NOT a deletion of the policy object itself.

CMIS Services:

GET: getAppliedPolicies

POST: applyPolicy (to object representing this collection of policies)

DELETE: removePolicy

Media Type: application/atom+xml;type=feed

Accept:

- MUST support Atom Entry Documents with CMIS extensions
  - application/atom+xml;type=entry or
  - application/cmisatom+xml
- MAY support other media type

Link Relations:

- service: Points to service document containing the CMIS repository. The service document MUST contain only one workspace element.
  - Media Type: application/atomsvc+xml
- via: points to the atom entry of the resource generating this collection
- paging link relations as appropriate: first, next, previous, last

The policy entries displayed here are specific to the object generating this collection. A DELETE method on those URIs will invoke removePolicy().

The following CMIS Atom extension element MAY be included inside the atom feed:

- cmisra:numItems

The following CMIS Atom extension element MUST be included inside the atom entries:

- cmisra:object inside atom:entry

3.8.3.1 GET

The following arguments may be supplied. Please see the domain model for more information:

- filter

3.8.3.2 POST

When an Atom Entry representing a Policy is posted to this collection, the policy will be applied to the object.

Example client request:

```
 POST /policies/f3670f66-62ee-487f-b733-999a69237024 HTTP/1.1
Host: example.org
Content-Length: 1039
Content-Type: application/atom+xml;type=entry


<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<atom:entry xmlns:app=""http://www.w3.org/2007/app""
xmlns:atom=""http://www.w3.org/2005/Atom"" xmlns:cmis=""http://docs.oasis-
open.org/ns/cmis/core/200908/"" xmlns:cmism=""http://docs.oasis-
open.org/ns/cmis/messaging/200908/"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:author>
        <atom:name>Al Brown</atom:name>
    </atom:author>
    <atom:content src=""http://cmisexample.oasis-open.org/rep1/f3670f66-62ee-
487f-b733-999a69237024""/>
    <atom:id>urn:uuid:f3670f66-62ee-487f-b733-999a69237024</atom:id>
    <atom:title type=""text"">Security Policy for Invoices</atom:title>
    <atom:updated>2010-01-25T10:20:58.849-08:00</atom:updated>
    <cmisra:object>
        <cmis:properties>
            <cmis:propertyId localName=""rep-cmis:objectId""
propertyDefinitionId=""cmis:objectId"">
                <cmis:value>f3670f66-62ee-487f-b733-999a69237024</cmis:value>
            </cmis:propertyId>
        </cmis:properties>
    </cmisra:object>
</atom:entry>
```

Example server response:

```
HTTP/1.1 201 Created
Date: Mon, 25 Jan 2010 10:20:58 -0800
Content-Length: 4043
Content-Type: application/atom+xml;type=entry
Content-Location: http://cmisexample.oasis-open.org/rep1/55cca51b-6cfa-4354-
bdfe-690761576116
Location: http://cmisexample.oasis-open.org/rep1/55cca51b-6cfa-4354-bdfe-
690761576116


<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
```

```
<atom:entry xmlns:app="http://www.w3.org/2007/app"
xmlns:atom="http://www.w3.org/2005/Atom" xmlns:cmis="http://docs.oasis-
open.org/ns/cmis/core/200908/" xmlns:cmism="http://docs.oasis-
open.org/ns/cmis/messaging/200908/" xmlns:cmisra="http://docs.oasis-
open.org/ns/cmis/restatom/200908/">
    <atom:author>
        <atom:name>Al Brown</atom:name>
        <atom:uri>http://www.ibm.com/</atom:uri>
        <atom:email>albertcbrown@us.ibm.com</atom:email>
    </atom:author>
    <atom:content src="http://cmisexample.oasis-open.org/rep1/55cca51b-6cfa-
4354-bdfe-690761576116"/>
    <atom:id>urn:uuid:55cca51b-6cfa-4354-bdfe-690761576116</atom:id>
    <atom:title type="text">Security Policy for Invoices</atom:title>
    <atom:updated>2010-01-25T10:20:58.849-08:00</atom:updated>
    <atom:link rel="self" href="http://cmisexample.oasis-
open.org/rep1/55cca51b-6cfa-4354-bdfe-690761576116"/>
    <atom:link rel="edit" href="http://cmisexample.oasis-
open.org/rep1/55cca51b-6cfa-4354-bdfe-690761576116"/>
    <atom:link type="application/cmis+xml;type=allowableActions"
rel="http://docs.oasis-open.org/ns/cmis/link/200908/allowableactions"
href="http://cmisexample.oasis-open.org/rep1/55cca51b-6cfa-4354-bdfe-
690761576116/allowableactions"/>
    <atom:link type="application/atom+xml;type=entry" rel="describedby"
href="http://cmisexample.oasis-open.org/rep1/55cca51b-6cfa-4354-bdfe-
690761576116/type"/>
    <atom:link type="application/atomsvc+xml" rel="service"
href="http://cmisexample.oasis-open.org/rep1//service"/>
    <atom:published>2010-01-25T10:20:58.849-08:00</atom:published>
    <atom:summary type="html">HTML summary of Entry  55cca51b-6cfa-4354-
bdfe-690761576116</atom:summary>
    <atom:link type="application/atom+xml;type=feed" rel="up"
href="http://cmisexample.oasis-open.org/rep1/55cca51b-6cfa-4354-bdfe-
690761576116/parents"/>
    <atom:link type="application/atom+xml;type=feed"
rel="http://docs.oasis-open.org/ns/cmis/link/200908/relationships"
href="http://cmisexample.oasis-open.org/rep1/55cca51b-6cfa-4354-bdfe-
690761576116/relationships"/>
    <atom:link type="application/cmisacl+xml" rel="http://docs.oasis-
open.org/ns/cmis/link/200908/acl" href="http://cmisexample.oasis-
open.org/rep1/55cca51b-6cfa-4354-bdfe-690761576116/acl"/>
    <cmisra:object>
        <cmis:properties>
            <cmis:propertyId localName="rep-cmis:objectId"
propertyDefinitionId="cmis:objectId">
                <cmis:value>55cca51b-6cfa-4354-bdfe-690761576116</cmis:value>
            </cmis:propertyId>
            <cmis:propertyId localName="rep-cmis:objectTypeId"
propertyDefinitionId="cmis:objectTypeId">
                <cmis:value>generalSecurityPolicy</cmis:value>
            </cmis:propertyId>
            <cmis:propertyString localName="rep-cmis:name"
propertyDefinitionId="cmis:name">
                <cmis:value>Security Policy for Invoices</cmis:value>
            </cmis:propertyString>
            <cmis:propertyDateTime localName="rep-cmis:creationDate"
propertyDefinitionId="cmis:creationDate">
                <cmis:value>2010-01-25T10:20:58.849-08:00</cmis:value>
            </cmis:propertyDateTime>
            <cmis:propertyDateTime localName="rep-cmis:lastModificationDate"
propertyDefinitionId="cmis:lastModificationDate">
                <cmis:value>2010-01-25T10:20:58.864-08:00</cmis:value>
            </cmis:propertyDateTime>
            <cmis:propertyId localName=""rep-cmis:baseTypeId""
propertyDefinitionId=""cmis:baseTypeId"">
                <cmis:value>cmis:policy</cmis:value>
            </cmis:propertyId>
            <cmis:propertyString localName=""rep-cmis:lastModifiedBy""
propertyDefinitionId=""cmis:lastModifiedBy"">
                <cmis:value>Al Brown</cmis:value>
            </cmis:propertyString>
            <cmis:propertyString localName=""rep-cmis:createdBy""
propertyDefinitionId=""cmis:createdBy"">
                <cmis:value>Al Brown</cmis:value>
            </cmis:propertyString>
        </cmis:properties>
    </cmisra:object>
</atom:entry>
```

Please also see the example documents included with the schema.

3.8.3.3 DELETE

This is the only collection where the URI’'s of the objects in the collection MUST be specific to that collection. A DELETE on the policy object in the collection is a removal of the policy from the object NOT a deletion of the policy object itself.

3.9 Feeds

For any HTTP verb not specified on a resource,each implementation MAY chose to implement that HTTP verb in a repository-specific manner.

3.9.1 Object Parents Feed

This is the set of parents for a specific object.

CMIS Services:

GET: getObjectParents

Media Type: application/atom+xml;type=feed

Link Relations:

- service: Points to service document containing the CMIS repository. The service document MUST contain only one workspace element.
  - Media Type: application/atomsvc+xml
- via: points to the atom entry of object who’'s parents are represented by this collection

This feed contains a set of atom entries for each parent of the object that MUST contain:

- cmisra:object inside atom:entry
- cmisra:relativePathSegment inside atom:entry for the name of the object inside the folder

Example:

```
<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
```

```
<atom:feed xmlns:cmis=""http://docs.oasis-open.org/ns/cmis/core/200908/""
xmlns:cmism=""http://docs.oasis-open.org/ns/cmis/messaging/200908/""
xmlns:atom=""http://www.w3.org/2005/Atom""
xmlns:app=""http://www.w3.org/2007/app"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:title type=""text"">Parent Feed for 268d30b5-91a0-47f0-b985-
6765e178f0bb</atom:title>
    <atom:author>
        <atom:name>Al Brown</atom:name>
        <atom:uri>http://www.ibm.com/</atom:uri>
        <atom:email>albertcbrown@us.ibm.com</atom:email>
    </atom:author>
    <atom:updated>2010-01-25T10:20:59.818-08:00</atom:updated>
    <atom:id>urn:uuid:6f541940-4abf-471b-99f0-8e6f66d53789</atom:id>
    <atom:link type=""application/atom+xml;type=feed"" rel=""self""
href=""http://cmisexample.oasis-open.org/rep1/268d30b5-91a0-47f0-b985-
6765e178f0bb/3""/>
    <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
    <atom:link type=""application/atom+xml;type=entry"" rel=""via""
href=""http://cmisexample.oasis-open.org/rep1/268d30b5-91a0-47f0-b985-
6765e178f0bb""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""first""
href=""http://cmisexample.oasis-open.org/rep1/268d30b5-91a0-47f0-b985-
6765e178f0bb/first""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""next""
href=""http://cmisexample.oasis-open.org/rep1/268d30b5-91a0-47f0-b985-
6765e178f0bb/4""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""previous""
href=""http://cmisexample.oasis-open.org/rep1/268d30b5-91a0-47f0-b985-
6765e178f0bb/2""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""last""
href=""http://cmisexample.oasis-open.org/rep1/268d30b5-91a0-47f0-b985-
6765e178f0bb/last""/>
    <cmisra:numItems>1</cmisra:numItems>
    <atom:entry>
        <atom:author>
            <atom:name>Al Brown</atom:name>
            <atom:uri>http://www.ibm.com/</atom:uri>
            <atom:email>albertcbrown@us.ibm.com</atom:email>
        </atom:author>
        <atom:content src=""http://cmisexample.oasis-open.org/rep1/661d6945-
8f75-4dea-8799-7ba07b0e510e""/>
        <atom:id>urn:uuid:661d6945-8f75-4dea-8799-7ba07b0e510e</atom:id>
        <atom:title type=""text"">Customer Folder</atom:title>
        <atom:updated>2010-01-25T10:20:59.833-08:00</atom:updated>
        <atom:link rel=""self"" href=""http://cmisexample.oasis-
open.org/rep1/661d6945-8f75-4dea-8799-7ba07b0e510e""/>
        <atom:link rel=""edit"" href=""http://cmisexample.oasis-
open.org/rep1/661d6945-8f75-4dea-8799-7ba07b0e510e""/>
        <atom:link type=""application/cmis+xml;type=allowableActions""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/allowableactions""
href=""http://cmisexample.oasis-open.org/rep1/661d6945-8f75-4dea-8799-
7ba07b0e510e/allowableactions""/>
        <atom:link type=""application/atom+xml;type=entry""
rel=""describedby"" href=""http://cmisexample.oasis-open.org/rep1/661d6945-
8f75-4dea-8799-7ba07b0e510e/type""/>
        <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
        <atom:published>2010-01-25T10:20:59.833-08:00</atom:published>
        <atom:summary type=""html"">HTML summary of Entry  661d6945-8f75-4dea-
8799-7ba07b0e510e</atom:summary>
```

```
        <atom:link type=""application/atom+xml;type=entry"" rel=""up""
href=""http://cmisexample.oasis-open.org/rep1/661d6945-8f75-4dea-8799-
7ba07b0e510e/up""/>
        <atom:link type=""application/atom+xml;type=feed"" rel=""down""
href=""http://cmisexample.oasis-open.org/rep1/661d6945-8f75-4dea-8799-
7ba07b0e510e/children""/>
        <atom:link type=""application/cmistree+xml"" rel=""down""
href=""http://cmisexample.oasis-open.org/rep1/661d6945-8f75-4dea-8799-
7ba07b0e510e/tree""/>
        <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/foldertree""
href=""http://cmisexample.oasis-open.org/rep1/661d6945-8f75-4dea-8799-
7ba07b0e510e/foldertree""/>
        <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/relationships""
href=""http://cmisexample.oasis-open.org/rep1/661d6945-8f75-4dea-8799-
7ba07b0e510e/relationships""/>
        <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/policies""
href=""http://cmisexample.oasis-open.org/rep1/661d6945-8f75-4dea-8799-
7ba07b0e510e/policies""/>
        <atom:link type=""application/cmisacl+xml"" rel=""http://docs.oasis-
open.org/ns/cmis/link/200908/acl"" href=""http://cmisexample.oasis-
open.org/rep1/661d6945-8f75-4dea-8799-7ba07b0e510e/acl""/>
        <cmisra:object>
            <cmis:properties>
                <cmis:propertyId localName=""rep-cmis:objectId""
propertyDefinitionId=""cmis:objectId"">
                    <cmis:value>661d6945-8f75-4dea-8799-
7ba07b0e510e</cmis:value>
                </cmis:propertyId>
                <cmis:propertyId localName=""rep-cmis:objectTypeId""
propertyDefinitionId=""cmis:objectTypeId"">
                    <cmis:value>customer</cmis:value>
                </cmis:propertyId>
                <cmis:propertyString localName=""rep-cmis:name""
propertyDefinitionId=""cmis:name"">
                    <cmis:value>Customer Folder</cmis:value>
                </cmis:propertyString>
                <cmis:propertyDateTime localName=""rep-cmis:creationDate""
propertyDefinitionId=""cmis:creationDate"">
                    <cmis:value>2010-01-25T10:20:59.833-08:00</cmis:value>
                </cmis:propertyDateTime>
                <cmis:propertyDateTime localName=""rep-
cmis:lastModificationDate""
propertyDefinitionId=""cmis:lastModificationDate"">
                    <cmis:value>2010-01-25T10:20:59.833-08:00</cmis:value>
                </cmis:propertyDateTime>
                <cmis:propertyId localName=""rep-cmis:baseTypeId""
propertyDefinitionId=""cmis:baseTypeId"">
                    <cmis:value>cmis:folder</cmis:value>
                </cmis:propertyId>
                <cmis:propertyString localName=""rep-cmis:lastModifiedBy""
propertyDefinitionId=""cmis:lastModifiedBy"">
                    <cmis:value>Al Brown</cmis:value>
                </cmis:propertyString>
                <cmis:propertyString localName=""rep-cmis:createdBy""
propertyDefinitionId=""cmis:createdBy"">
                    <cmis:value>Al Brown</cmis:value>
                </cmis:propertyString>
                <cmis:propertyId localName=""rep-cmis:parentId""
propertyDefinitionId=""cmis:parentId"">
                    <cmis:value>661d6945-8f75-4dea-8799-
7ba07b0e510eup</cmis:value>
```

```
                </cmis:propertyId>
            </cmis:properties>
        </cmisra:object>
        <cmisra:relativePathSegment>customer1</cmisra:relativePathSegment>
    </atom:entry>
</atom:feed>
```

Please also see the example documents included with the schema.

3.9.1.1 GET

The following arguments may be supplied. Please see the domain model for more information:

- filter
- includeAllowableActions
- includeRelationships
- renditionFilter
- includeRelativePathSegment
    - If true, then the cmisra:relativePathSegment element MUST be included in the response.

3.9.2 Changes

This is a link relationship described in the service document that contains the changes in the repository in the workspace element. The link relation pointing to this feed is *http://docs.oasis-open.org/ns/cmis/link/200908/changes.*

The ChangeLog Token is specified in the URI specified by the paging link notations. Through this binding it is not possible to retrieve the ChangeLog Token from the URIs.

CMIS Services:

GET: getContentChanges()

Media Type: application/atom+xml;type=feed

Link Relations:

- service: Points to service document containing the CMIS repository. The service document MUST contain only one workspace element.
    - Media Type: application/atomsvc+xml
- paging link relations as appropriate: first, next, previous, last
    - ChangeLogToken is incorporated into the URI specified by the next link relation

This feed MUST be ordered from oldest first to newest.

If the next changes does not exist yet, the link relation next MAY be available. If the next link relation is not available, the client should revisit the feed in the future and look for new items and the next link relation.

The following CMIS Atom extension element MAY be included inside the atom feed:

- cmisra:numItems

The following CMIS Atom extension element MUST be included inside the atom entries:

- cmisra:object inside atom:entry

Example:

```
<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<atom:feed xmlns:cmis=""http://docs.oasis-open.org/ns/cmis/core/200908/""
xmlns:cmism=""http://docs.oasis-open.org/ns/cmis/messaging/200908/""
xmlns:atom=""http://www.w3.org/2005/Atom""
xmlns:app=""http://www.w3.org/2007/app"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:title type=""text"">changelog feed</atom:title>
    <atom:author>
        <atom:name>Al Brown</atom:name>
        <atom:uri>http://www.ibm.com/</atom:uri>
        <atom:email>albertcbrown@us.ibm.com</atom:email>
    </atom:author>
    <atom:updated>2010-01-25T10:20:59.255-08:00</atom:updated>
    <atom:id>urn:uuid:0bfc5306-fc76-4cd8-a0c0-7653dd43c0ff</atom:id>
    <atom:link type=""application/atom+xml;type=feed"" rel=""self""
href=""http://cmisexample.oasis-open.org/rep1/oId/3""/>
    <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""first""
href=""http://cmisexample.oasis-open.org/rep1/oId/first""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""next""
href=""http://cmisexample.oasis-open.org/rep1/oId/4""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""previous""
href=""http://cmisexample.oasis-open.org/rep1/oId/2""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""last""
href=""http://cmisexample.oasis-open.org/rep1/oId/last""/>
    <cmisra:numItems>2</cmisra:numItems>
    <atom:entry>
        <atom:author>
            <atom:name>Al Brown</atom:name>
            <atom:uri>http://www.ibm.com/</atom:uri>
            <atom:email>albertcbrown@us.ibm.com</atom:email>
        </atom:author>
        <atom:content src=""http://cmisexample.oasis-open.org/rep1/3f724c1d-
12c8-43f2-919f-674df52b6ebd""/>
        <atom:id>urn:uuid:3f724c1d-12c8-43f2-919f-674df52b6ebd</atom:id>
        <atom:title type=""text"">CMIS Example Folder as Customer Policy
type</atom:title>
        <atom:updated>2010-01-25T10:20:59.255-08:00</atom:updated>
        <atom:link rel=""self"" href=""http://cmisexample.oasis-
open.org/rep1/3f724c1d-12c8-43f2-919f-674df52b6ebd""/>
        <atom:link rel=""edit"" href=""http://cmisexample.oasis-
open.org/rep1/3f724c1d-12c8-43f2-919f-674df52b6ebd""/>
        <atom:link type=""application/cmis+xml;type=allowableActions""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/allowableactions""
href=""http://cmisexample.oasis-open.org/rep1/3f724c1d-12c8-43f2-919f-
674df52b6ebd/allowableactions""/>
        <atom:link type=""application/atom+xml;type=entry""
rel=""describedby"" href=""http://cmisexample.oasis-open.org/rep1/3f724c1d-
12c8-43f2-919f-674df52b6ebd/type""/>
        <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
        <atom:published>2010-01-25T10:20:59.255-08:00</atom:published>
        <atom:summary type=""html"">HTML summary of Entry  3f724c1d-12c8-43f2-
919f-674df52b6ebd</atom:summary>
        <atom:link type=""application/atom+xml;type=entry"" rel=""up""
href=""http://cmisexample.oasis-open.org/rep1/3f724c1d-12c8-43f2-919f-
674df52b6ebd/up""/>
```

```
        <atom:link type=""application/atom+xml;type=feed"" rel=""down""
href=""http://cmisexample.oasis-open.org/rep1/3f724c1d-12c8-43f2-919f-
674df52b6ebd/children""/>
        <atom:link type=""application/cmistree+xml"" rel=""down""
href=""http://cmisexample.oasis-open.org/rep1/3f724c1d-12c8-43f2-919f-
674df52b6ebd/tree""/>
        <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/foldertree""
href=""http://cmisexample.oasis-open.org/rep1/3f724c1d-12c8-43f2-919f-
674df52b6ebd/foldertree""/>
        <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/relationships""
href=""http://cmisexample.oasis-open.org/rep1/3f724c1d-12c8-43f2-919f-
674df52b6ebd/relationships""/>
        <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/policies""
href=""http://cmisexample.oasis-open.org/rep1/3f724c1d-12c8-43f2-919f-
674df52b6ebd/policies""/>
        <atom:link type=""application/cmisacl+xml"" rel=""http://docs.oasis-
open.org/ns/cmis/link/200908/acl"" href=""http://cmisexample.oasis-
open.org/rep1/3f724c1d-12c8-43f2-919f-674df52b6ebd/acl""/>
        <cmisra:object>
            <cmis:properties>
                <cmis:propertyId localName=""rep-cmis:objectId""
propertyDefinitionId=""cmis:objectId"">
                    <cmis:value>3f724c1d-12c8-43f2-919f-
674df52b6ebd</cmis:value>
                </cmis:propertyId>
                <cmis:propertyId localName=""rep-cmis:objectTypeId""
propertyDefinitionId=""cmis:objectTypeId"">
                    <cmis:value>customerpolicy</cmis:value>
                </cmis:propertyId>
                <cmis:propertyString localName=""rep-cmis:name""
propertyDefinitionId=""cmis:name"">
                    <cmis:value>CMIS Example Folder as Customer Policy
type</cmis:value>
                </cmis:propertyString>
                <cmis:propertyDateTime localName=""rep-cmis:creationDate""
propertyDefinitionId=""cmis:creationDate"">
                    <cmis:value>2010-01-25T10:20:59.255-08:00</cmis:value>
                </cmis:propertyDateTime>
                <cmis:propertyDateTime localName=""rep-
cmis:lastModificationDate""
propertyDefinitionId=""cmis:lastModificationDate"">
                    <cmis:value>2010-01-25T10:20:59.255-08:00</cmis:value>
                </cmis:propertyDateTime>
                <cmis:propertyId localName=""rep-cmis:baseTypeId""
propertyDefinitionId=""cmis:baseTypeId"">
                    <cmis:value>cmis:folder</cmis:value>
                </cmis:propertyId>
                <cmis:propertyString localName=""rep-cmis:lastModifiedBy""
propertyDefinitionId=""cmis:lastModifiedBy"">
                    <cmis:value>Al Brown</cmis:value>
                </cmis:propertyString>
                <cmis:propertyString localName=""rep-cmis:createdBy""
propertyDefinitionId=""cmis:createdBy"">
                    <cmis:value>Al Brown</cmis:value>
                </cmis:propertyString>
                <cmis:propertyId localName=""rep-cmis:parentId""
propertyDefinitionId=""cmis:parentId"">
                    <cmis:value>3f724c1d-12c8-43f2-919f-
674df52b6ebdup</cmis:value>
                </cmis:propertyId>
            </cmis:properties>
            <cmis:changeEventInfo>
                <cmis:changeType>updated</cmis:changeType>
                <cmis:changeTime>2010-01-25T10:20:59.255-
08:00</cmis:changeTime>
            </cmis:changeEventInfo>
        </cmisra:object>
        <cmisra:pathSegment>policy</cmisra:pathSegment>
    </atom:entry>
    <atom:entry>
        <atom:author>
            <atom:name>Al Brown</atom:name>
            <atom:uri>http://www.ibm.com/</atom:uri>
            <atom:email>albertcbrown@us.ibm.com</atom:email>
        </atom:author>
        <atom:content src=""http://cmisexample.oasis-open.org/rep1/6e27bada-
b5a2-4a39-be2c-269806eb0d42""/>
        <atom:id>urn:uuid:6e27bada-b5a2-4a39-be2c-269806eb0d42</atom:id>
        <atom:title type=""text"">CMIS Example Document</atom:title>
        <atom:updated>2010-01-25T10:20:59.255-08:00</atom:updated>
        <atom:link rel=""self"" href=""http://cmisexample.oasis-
open.org/rep1/6e27bada-b5a2-4a39-be2c-269806eb0d42""/>
        <atom:link rel=""edit"" href=""http://cmisexample.oasis-
open.org/rep1/6e27bada-b5a2-4a39-be2c-269806eb0d42""/>
        <atom:link type=""application/cmis+xml;type=allowableActions""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/allowableactions""
href=""http://cmisexample.oasis-open.org/rep1/6e27bada-b5a2-4a39-be2c-
269806eb0d42/allowableactions""/>
        <atom:link type=""application/atom+xml;type=entry""
rel=""describedby"" href=""http://cmisexample.oasis-open.org/rep1/6e27bada-
b5a2-4a39-be2c-269806eb0d42/type""/>
        <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
        <atom:published>2010-01-25T10:20:59.255-08:00</atom:published>
        <atom:summary type=""html"">HTML summary of Entry  6e27bada-b5a2-4a39-
be2c-269806eb0d42</atom:summary>
        <atom:link rel=""edit-media"" href=""http://cmisexample.oasis-
open.org/rep1/6e27bada-b5a2-4a39-be2c-269806eb0d42/edit-media""/>
        <atom:link rel=""alternate"" href=""http://cmisexample.oasis-
open.org/rep1/6e27bada-b5a2-4a39-be2c-269806eb0d42/alternate""/>
        <atom:link type=""application/atom+xml;type=feed"" rel=""up""
href=""http://cmisexample.oasis-open.org/rep1/6e27bada-b5a2-4a39-be2c-
269806eb0d42/parents""/>
        <atom:link type=""application/atom+xml;type=feed"" rel=""version-
history"" href=""http://cmisexample.oasis-open.org/rep1/6e27bada-b5a2-4a39-
be2c-269806eb0d42/allversions""/>
        <atom:link type=""application/atom+xml;type=entry"" rel=""current-
version"" href=""http://cmisexample.oasis-open.org/rep1/6e27bada-b5a2-4a39-
be2c-269806eb0d42/latest""/>
        <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/relationships""
href=""http://cmisexample.oasis-open.org/rep1/6e27bada-b5a2-4a39-be2c-
269806eb0d42/relationships""/>
        <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/policies""
href=""http://cmisexample.oasis-open.org/rep1/6e27bada-b5a2-4a39-be2c-
269806eb0d42/policies""/>
        <atom:link type=""application/cmisacl+xml"" rel=""http://docs.oasis-
open.org/ns/cmis/link/200908/acl"" href=""http://cmisexample.oasis-
open.org/rep1/6e27bada-b5a2-4a39-be2c-269806eb0d42/acl""/>
        <cmisra:object>
            <cmis:properties>
                <cmis:propertyId localName=""rep-cmis:objectId""
propertyDefinitionId=""cmis:objectId"">
```

```
                    <cmis:value>6e27bada-b5a2-4a39-be2c-
269806eb0d42</cmis:value>
                </cmis:propertyId>
                <cmis:propertyId localName=""rep-cmis:objectTypeId""
propertyDefinitionId=""cmis:objectTypeId"">
                    <cmis:value>document</cmis:value>
                </cmis:propertyId>
                <cmis:propertyString localName=""rep-cmis:name""
propertyDefinitionId=""cmis:name"">
                    <cmis:value>CMIS Example Document</cmis:value>
                </cmis:propertyString>
                <cmis:propertyDateTime localName=""rep-cmis:creationDate""
propertyDefinitionId=""cmis:creationDate"">
                    <cmis:value>2010-01-25T10:20:59.271-08:00</cmis:value>
                </cmis:propertyDateTime>
                <cmis:propertyDateTime localName=""rep-
cmis:lastModificationDate""
propertyDefinitionId=""cmis:lastModificationDate"">
                    <cmis:value>2010-01-25T10:20:59.271-08:00</cmis:value>
                </cmis:propertyDateTime>
                <cmis:propertyId localName=""rep-cmis:baseTypeId""
propertyDefinitionId=""cmis:baseTypeId"">
                    <cmis:value>cmis:document</cmis:value>
                </cmis:propertyId>
                <cmis:propertyString localName=""rep-cmis:lastModifiedBy""
propertyDefinitionId=""cmis:lastModifiedBy"">
                    <cmis:value>Al Brown</cmis:value>
                </cmis:propertyString>
                <cmis:propertyString localName=""rep-cmis:createdBy""
propertyDefinitionId=""cmis:createdBy"">
                    <cmis:value>Al Brown</cmis:value>
                </cmis:propertyString>
                <cmis:propertyBoolean localName=""rep-cmis:isLatestVersion""
propertyDefinitionId=""cmis:isLatestVersion"">
                    <cmis:value>true</cmis:value>
                </cmis:propertyBoolean>
                <cmis:propertyBoolean localName=""rep-
cmis:isVersionSeriesCheckedOut""
propertyDefinitionId=""cmis:isVersionSeriesCheckedOut"">
                    <cmis:value>false</cmis:value>
                </cmis:propertyBoolean>
                <cmis:propertyBoolean localName=""rep-cmis:isMajorVersion""
propertyDefinitionId=""cmis:isMajorVersion"">
                    <cmis:value>false</cmis:value>
                </cmis:propertyBoolean>
                <cmis:propertyBoolean localName=""rep-
cmis:isLatestMajorVersion""
propertyDefinitionId=""cmis:isLatestMajorVersion"">
                    <cmis:value>false</cmis:value>
                </cmis:propertyBoolean>
                <cmis:propertyBoolean localName=""rep-cmis:isImmutable""
propertyDefinitionId=""cmis:isImmutable"">
                    <cmis:value>false</cmis:value>
                </cmis:propertyBoolean>
                <cmis:propertyString localName=""rep-cmis:checkinComment""
propertyDefinitionId=""cmis:checkinComment"">
                    <cmis:value>Checkin comment</cmis:value>
                </cmis:propertyString>
                <cmis:propertyString localName=""rep-cmis:versionLabel""
propertyDefinitionId=""cmis:versionLabel"">
                    <cmis:value>0.1</cmis:value>
                </cmis:propertyString>
                <cmis:propertyString localName=""rep-
cmis:contentStreamMimeType""
propertyDefinitionId=""cmis:contentStreamMimeType"">
                    <cmis:value>text/plain</cmis:value>
                </cmis:propertyString>
                <cmis:propertyString localName=""rep-
cmis:contentStreamFileName""
propertyDefinitionId=""cmis:contentStreamFileName"">
                    <cmis:value>text.txt</cmis:value>
                </cmis:propertyString>
                <cmis:propertyInteger localName=""rep-
cmis:contentStreamLength"" propertyDefinitionId=""cmis:contentStreamLength"">
                    <cmis:value>4234</cmis:value>
                </cmis:propertyInteger>
                <cmis:propertyString displayName=""Keywords for Document""
localName=""keywords"" propertyDefinitionId=""keywords"">
                    <cmis:value>document</cmis:value>
                    <cmis:value>example</cmis:value>
                    <cmis:value>sample</cmis:value>
                    <cmis:value>cmis</cmis:value>
                </cmis:propertyString>
            </cmis:properties>
            <cmis:changeEventInfo>
                <cmis:changeType>updated</cmis:changeType>
                <cmis:changeTime>2010-01-25T10:20:59.271-
08:00</cmis:changeTime>
            </cmis:changeEventInfo>
        </cmisra:object>
        <cmisra:pathSegment>invoice.pdf</cmisra:pathSegment>
    </atom:entry>
</atom:feed>
```

Please also see the example documents included with the schema.

3.9.2.1 GET

The following optional parameters may be supplied:

- filter
- maxItems
- includeACL
- includePolicyIds
- includeProperties
- changeLogToken: If this parameter is specified, start the changes from the specified token. The changeLogToken is embedded in the paging link relations for normal iteration through the change list.

3.9.3 Folder Descendants

This is a hierarchical feed comprising items under a specified folder to a specified depth. This is available via the link relation down with the application/cmistree+xml media type. Please see the Hierarchical Atom Entries for more information on format.

If a repository does not support capabilityGetDescendants, then these resources SHOULD NOT be exposed.

CMIS Services:

GET: getDescendants

DELETE: deleteTree

Media Type: application/atom+xml;type=feed

Link Relations:

- service: Points to service document containing the CMIS repository. The service document MUST contain only one workspace element.
  - Media Type: application/atomsvc+xml
- via: points to the atom entry of the folder generating this collection
- up: points to the atom entry document for this folder~~’~~'s parent
  - Media Type: application/atom+xml;type=entry
  - If the root folder, this link relation MUST not be included.
- down:
  - points to the atom feed document representing the children feed for this same folder with media type of application/atom+xml;type=entry
  - Since this is the descendants, the descendants link SHOULD NOT be included
- paging link relations MAY be included as appropriate: first, next, previous, last
  - Repositories may support these paging link relations on a particular cmisra:children element.
- *http://docs.oasis-open.org/ns/cmis/link/200908/foldertree*: Points to the folder tree for this folder

The following CMIS Atom extension element MAY be included inside the atom feed:

- cmisra:numItems

The following CMIS Atom extension element MUST be included inside the atom entries:

- cmisra:object inside atom:entry
- cmisra:pathSegment inside atom:entry
- cmisra:children inside atom:entry

Example:

```
<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<atom:feed xmlns:cmis=""http://docs.oasis-open.org/ns/cmis/core/200908/""
xmlns:cmism=""http://docs.oasis-open.org/ns/cmis/messaging/200908/""
xmlns:atom=""http://www.w3.org/2005/Atom""
xmlns:app=""http://www.w3.org/2007/app"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:title type=""text"">Feed for folder1</atom:title>
    <atom:author>
        <atom:name>Al Brown</atom:name>
        <atom:uri>http://www.ibm.com/</atom:uri>
        <atom:email>albertcbrown@us.ibm.com</atom:email>
    </atom:author>
    <atom:updated>2010-01-25T10:20:59.364-08:00</atom:updated>
    <atom:id>urn:uuid:cb0a47d4-8d09-46f9-9b09-584acad684af</atom:id>
    <atom:link type=""application/atom+xml;type=feed"" rel=""self""
href=""http://cmisexample.oasis-open.org/rep1/f083dd6f-1465-4516-97ce-
040ec0c7c05a/3""/>
    <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
```

```
    <atom:link type=""application/atom+xml;type=entry"" rel=""via""
href=""http://cmisexample.oasis-open.org/rep1/f083dd6f-1465-4516-97ce-
040ec0c7c05a""/>
    <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/foldertree""
href=""http://cmisexample.oasis-open.org/rep1/f083dd6f-1465-4516-97ce-
040ec0c7c05a/foldertree""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""down""
href=""http://cmisexample.oasis-open.org/rep1/f083dd6f-1465-4516-97ce-
040ec0c7c05a/children""/>
    <atom:link type=""application/atom+xml;type=entry"" rel=""up""
href=""http://cmisexample.oasis-open.org/rep1/03dcf5b8-5f82-45a1-b276-
44d88069eec3""/>
    <cmisra:numItems>1</cmisra:numItems>
    <atom:entry>
        <atom:author>
            <atom:name>Al Brown</atom:name>
            <atom:uri>http://www.ibm.com/</atom:uri>
            <atom:email>albertcbrown@us.ibm.com</atom:email>
        </atom:author>
        <atom:content src=""http://cmisexample.oasis-open.org/rep1/8e5a512c-
8f2d-4387-a283-f3f30bbc312f""/>
        <atom:id>urn:uuid:8e5a512c-8f2d-4387-a283-f3f30bbc312f</atom:id>
        <atom:title type=""text"">CMIS Example Folder as Customer
type</atom:title>
        <atom:updated>2010-01-25T10:20:59.364-08:00</atom:updated>
        <atom:link rel=""self"" href=""http://cmisexample.oasis-
open.org/rep1/8e5a512c-8f2d-4387-a283-f3f30bbc312f""/>
        <atom:link rel=""edit"" href=""http://cmisexample.oasis-
open.org/rep1/8e5a512c-8f2d-4387-a283-f3f30bbc312f""/>
        <atom:link type=""application/cmis+xml;type=allowableActions""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/allowableactions""
href=""http://cmisexample.oasis-open.org/rep1/8e5a512c-8f2d-4387-a283-
f3f30bbc312f/allowableactions""/>
        <atom:link type=""application/atom+xml;type=entry""
rel=""describedby"" href=""http://cmisexample.oasis-open.org/rep1/8e5a512c-
8f2d-4387-a283-f3f30bbc312f/type""/>
        <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
        <atom:published>2010-01-25T10:20:59.380-08:00</atom:published>
        <atom:summary type=""html"">HTML summary of Entry  8e5a512c-8f2d-4387-
a283-f3f30bbc312f</atom:summary>
        <atom:link type=""application/atom+xml;type=entry"" rel=""up""
href=""http://cmisexample.oasis-open.org/rep1/8e5a512c-8f2d-4387-a283-
f3f30bbc312f/up""/>
        <atom:link type=""application/atom+xml;type=feed"" rel=""down""
href=""http://cmisexample.oasis-open.org/rep1/8e5a512c-8f2d-4387-a283-
f3f30bbc312f/children""/>
        <atom:link type=""application/cmistree+xml"" rel=""down""
href=""http://cmisexample.oasis-open.org/rep1/8e5a512c-8f2d-4387-a283-
f3f30bbc312f/tree""/>
        <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/foldertree""
href=""http://cmisexample.oasis-open.org/rep1/8e5a512c-8f2d-4387-a283-
f3f30bbc312f/foldertree""/>
        <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/relationships""
href=""http://cmisexample.oasis-open.org/rep1/8e5a512c-8f2d-4387-a283-
f3f30bbc312f/relationships""/>
        <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/policies""
href=""http://cmisexample.oasis-open.org/rep1/8e5a512c-8f2d-4387-a283-
f3f30bbc312f/policies""/>
```

```
        <atom:link type=""application/cmisacl+xml"" rel=""http://docs.oasis-
open.org/ns/cmis/link/200908/acl"" href=""http://cmisexample.oasis-
open.org/rep1/8e5a512c-8f2d-4387-a283-f3f30bbc312f/acl""/>
        <cmisra:object>
            <cmis:properties>
                <cmis:propertyId localName=""rep-cmis:objectId""
propertyDefinitionId=""cmis:objectId"">
                    <cmis:value>8e5a512c-8f2d-4387-a283-
f3f30bbc312f</cmis:value>
                </cmis:propertyId>
                <cmis:propertyId localName=""rep-cmis:objectTypeId""
propertyDefinitionId=""cmis:objectTypeId"">
                    <cmis:value>customer</cmis:value>
                </cmis:propertyId>
                <cmis:propertyString localName=""rep-cmis:name""
propertyDefinitionId=""cmis:name"">
                    <cmis:value>CMIS Example Folder as Customer
type</cmis:value>
                </cmis:propertyString>
                <cmis:propertyDateTime localName=""rep-cmis:creationDate""
propertyDefinitionId=""cmis:creationDate"">
                    <cmis:value>2010-01-25T10:20:59.380-08:00</cmis:value>
                </cmis:propertyDateTime>
                <cmis:propertyDateTime localName=""rep-
cmis:lastModificationDate""
propertyDefinitionId=""cmis:lastModificationDate"">
                    <cmis:value>2010-01-25T10:20:59.380-08:00</cmis:value>
                </cmis:propertyDateTime>
                <cmis:propertyId localName=""rep-cmis:baseTypeId""
propertyDefinitionId=""cmis:baseTypeId"">
                    <cmis:value>cmis:folder</cmis:value>
                </cmis:propertyId>
                <cmis:propertyString localName=""rep-cmis:lastModifiedBy""
propertyDefinitionId=""cmis:lastModifiedBy"">
                    <cmis:value>Al Brown</cmis:value>
                </cmis:propertyString>
                <cmis:propertyString localName=""rep-cmis:createdBy""
propertyDefinitionId=""cmis:createdBy"">
                    <cmis:value>Al Brown</cmis:value>
                </cmis:propertyString>
                <cmis:propertyId localName=""rep-cmis:parentId""
propertyDefinitionId=""cmis:parentId"">
                    <cmis:value>8e5a512c-8f2d-4387-a283-
f3f30bbc312fup</cmis:value>
                </cmis:propertyId>
            </cmis:properties>
        </cmisra:object>
        <cmisra:pathSegment>customer</cmisra:pathSegment>
        <cmisra:children>
            <atom:feed>
                <atom:title type=""text"">CMIS Example Folder as Customer
type</atom:title>
                <atom:author>
                    <atom:name>Al Brown</atom:name>
                    <atom:uri>http://www.ibm.com/</atom:uri>
                    <atom:email>albertcbrown@us.ibm.com</atom:email>
                </atom:author>
                <atom:updated>2010-01-25T10:20:59.380-08:00</atom:updated>
                <atom:id>urn:uuid:67ee5e9f-d2e3-457d-9dec-
be718e780452</atom:id>
                <atom:link type=""application/atom+xml;type=feed""
rel=""self"" href=""http://cmisexample.oasis-open.org/rep1/8e5a512c-8f2d-4387-
a283-f3f30bbc312f/3""/>
```

```
                <atom:link type=~~”~~"application/atomsvc+xml~~”~~" rel=~~”~~"service~~”~~"
href=~~”~~"http://cmisexample.oasis-open.org/rep1//service~~”~~"/>
                <atom:link type=~~”~~"application/atom+xml;type=entry~~”~~"
rel=~~”~~"via~~”~~" href=~~”~~"http://cmisexample.oasis-open.org/rep1/8e5a512c-8f2d-4387-
a283-f3f30bbc312f~~”~~"/>
                <atom:link type=~~”~~"application/atom+xml;type=feed~~”~~"
rel=~~”~~"http://docs.oasis-open.org/ns/cmis/link/200908/foldertree~~”~~"
href=~~”~~"http://cmisexample.oasis-open.org/rep1/8e5a512c-8f2d-4387-a283-
f3f30bbc312f/foldertree~~”~~"/>
                <atom:link type=~~”~~"application/atom+xml;type=feed~~”~~"
rel=~~”~~"down~~”~~" href=~~”~~"http://cmisexample.oasis-open.org/rep1/8e5a512c-8f2d-4387-
a283-f3f30bbc312f/children~~”~~"/>
                <atom:link type=~~”~~"application/atom+xml;type=entry~~”~~" rel=~~”~~"up~~”~~"
href=~~”~~"http://cmisexample.oasis-open.org/rep1/f083dd6f-1465-4516-97ce-
040ec0c7c05a~~”~~"/>
                <cmisra:numItems>1</cmisra:numItems>
                <atom:entry>
                    <atom:author>
                        <atom:name>Al Brown</atom:name>
                        <atom:uri>http://www.ibm.com/</atom:uri>
                        <atom:email>albertcbrown@us.ibm.com</atom:email>
                    </atom:author>
                    <atom:content src=~~”~~"http://cmisexample.oasis-
open.org/rep1/8c2dbba5-ea33-469f-a052-9f01e636c72a~~”~~"/>
                    <atom:id>urn:uuid:8c2dbba5-ea33-469f-a052-
9f01e636c72a</atom:id>
                    <atom:title type=~~”~~"text~~”~~">CMIS Example Doc as Invoice
type</atom:title>
                    <atom:updated>2010-01-25T10:20:59.380-08:00</atom:updated>
                    <atom:link rel=~~”~~"self~~”~~" href=~~”~~"http://cmisexample.oasis-
open.org/rep1/8c2dbba5-ea33-469f-a052-9f01e636c72a~~”~~"/>
                    <atom:link rel=~~”~~"edit~~”~~" href=~~”~~"http://cmisexample.oasis-
open.org/rep1/8c2dbba5-ea33-469f-a052-9f01e636c72a~~”~~"/>
                    <atom:link
type=~~”~~"application/cmis+xml;type=allowableActions~~”~~" rel=~~”~~"http://docs.oasis-
open.org/ns/cmis/link/200908/allowableactions~~”~~"
href=~~”~~"http://cmisexample.oasis-open.org/rep1/8c2dbba5-ea33-469f-a052-
9f01e636c72a/allowableactions~~”~~"/>
                    <atom:link type=~~”~~"application/atom+xml;type=entry~~”~~"
rel=~~”~~"describedby~~”~~" href=~~”~~"http://cmisexample.oasis-open.org/rep1/8c2dbba5-
ea33-469f-a052-9f01e636c72a/type~~”~~"/>
                    <atom:link type=~~”~~"application/atomsvc+xml~~”~~"
rel=~~”~~"service~~”~~" href=~~”~~"http://cmisexample.oasis-open.org/rep1//service~~”~~"/>
                    <atom:published>2010-01-25T10:20:59.380-
08:00</atom:published>
                    <atom:summary type=~~”~~"html~~”~~">HTML summary of Entry
8c2dbba5-ea33-469f-a052-9f01e636c72a</atom:summary>
                    <atom:link rel=~~”~~"edit-media~~”~~"
href=~~”~~"http://cmisexample.oasis-open.org/rep1/8c2dbba5-ea33-469f-a052-
9f01e636c72a/edit-media~~”~~"/>
                    <atom:link rel=~~”~~"alternate~~”~~"
href=~~”~~"http://cmisexample.oasis-open.org/rep1/8c2dbba5-ea33-469f-a052-
9f01e636c72a/alternate~~”~~"/>
                    <atom:link type=~~”~~"application/atom+xml;type=feed~~”~~"
rel=~~”~~"up~~”~~" href=~~”~~"http://cmisexample.oasis-open.org/rep1/8c2dbba5-ea33-469f-
a052-9f01e636c72a/parents~~”~~"/>
                    <atom:link type=~~”~~"application/atom+xml;type=feed~~”~~"
rel=~~”~~"version-history~~”~~" href=~~”~~"http://cmisexample.oasis-
open.org/rep1/8c2dbba5-ea33-469f-a052-9f01e636c72a/allversions~~”~~"/>
                    <atom:link type=~~”~~"application/atom+xml;type=entry~~”~~"
rel=~~”~~"current-version~~”~~" href=~~”~~"http://cmisexample.oasis-
open.org/rep1/8c2dbba5-ea33-469f-a052-9f01e636c72a/latest~~”~~"/>
```

```
                    <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/relationships""
href=""http://cmisexample.oasis-open.org/rep1/8c2dbba5-ea33-469f-a052-
9f01e636c72a/relationships""/>
                    <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/policies""
href=""http://cmisexample.oasis-open.org/rep1/8c2dbba5-ea33-469f-a052-
9f01e636c72a/policies""/>
                    <atom:link type=""application/cmisacl+xml""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/acl""
href=""http://cmisexample.oasis-open.org/rep1/8c2dbba5-ea33-469f-a052-
9f01e636c72a/acl""/>
                    <cmisra:object>
                        <cmis:properties>
                            <cmis:propertyId localName=""rep-cmis:objectId""
propertyDefinitionId=""cmis:objectId"">
<cmis:value>8c2dbba5-ea33-469f-a052-9f01e636c72a</cmis:value>
                            </cmis:propertyId>
                            <cmis:propertyId localName=""rep-
cmis:objectTypeId"" propertyDefinitionId=""cmis:objectTypeId"">
<cmis:value>invoice</cmis:value>
                            </cmis:propertyId>
                            <cmis:propertyString localName=""rep-cmis:name""
propertyDefinitionId=""cmis:name"">
<cmis:value>CMIS Example Doc as Invoice type</cmis:value>
                            </cmis:propertyString>
                            <cmis:propertyDateTime localName=""rep-
cmis:creationDate"" propertyDefinitionId=""cmis:creationDate"">
<cmis:value>2010-01-25T10:20:59.380-08:00</cmis:value>
                            </cmis:propertyDateTime>
                            <cmis:propertyDateTime localName=""rep-
cmis:lastModificationDate""
propertyDefinitionId=""cmis:lastModificationDate"">
<cmis:value>2010-01-25T10:20:59.380-08:00</cmis:value>
                            </cmis:propertyDateTime>
                            <cmis:propertyId localName=""rep-cmis:baseTypeId""
propertyDefinitionId=""cmis:baseTypeId"">
<cmis:value>cmis:document</cmis:value>
                            </cmis:propertyId>
                            <cmis:propertyString localName=""rep-
cmis:lastModifiedBy"" propertyDefinitionId=""cmis:lastModifiedBy"">
<cmis:value>Al Brown</cmis:value>
                            </cmis:propertyString>
                            <cmis:propertyString localName=""rep-
cmis:createdBy"" propertyDefinitionId=""cmis:createdBy"">
<cmis:value>Al Brown</cmis:value>
                            </cmis:propertyString>
                            <cmis:propertyBoolean localName=""rep-
cmis:isLatestVersion"" propertyDefinitionId=""cmis:isLatestVersion"">
<cmis:value>true</cmis:value>
                            </cmis:propertyBoolean>
                            <cmis:propertyBoolean localName=""rep-
cmis:isVersionSeriesCheckedOut""
propertyDefinitionId=""cmis:isVersionSeriesCheckedOut"">
<cmis:value>false</cmis:value>
                            </cmis:propertyBoolean>
                            <cmis:propertyBoolean localName=""rep-
cmis:isMajorVersion"" propertyDefinitionId=""cmis:isMajorVersion"">
<cmis:value>false</cmis:value>
                            </cmis:propertyBoolean>
                            <cmis:propertyBoolean localName=""rep-
cmis:isLatestMajorVersion""
propertyDefinitionId=""cmis:isLatestMajorVersion"">
<cmis:value>false</cmis:value>
```

```
                            </cmis:propertyBoolean>
                            <cmis:propertyBoolean localName=""rep-
cmis:isImmutable"" propertyDefinitionId=""cmis:isImmutable"">
<cmis:value>false</cmis:value>
                            </cmis:propertyBoolean>
                            <cmis:propertyString localName=""rep-
cmis:checkinComment"" propertyDefinitionId=""cmis:checkinComment"">
<cmis:value>Checkin comment</cmis:value>
                            </cmis:propertyString>
                            <cmis:propertyString localName=""rep-
cmis:versionLabel"" propertyDefinitionId=""cmis:versionLabel"">
<cmis:value>0.1</cmis:value>
                            </cmis:propertyString>
                            <cmis:propertyString localName=""rep-
cmis:contentStreamMimeType""
propertyDefinitionId=""cmis:contentStreamMimeType"">
<cmis:value>text/plain</cmis:value>
                            </cmis:propertyString>
                            <cmis:propertyString localName=""rep-
cmis:contentStreamFileName""
propertyDefinitionId=""cmis:contentStreamFileName"">
<cmis:value>text.txt</cmis:value>
                            </cmis:propertyString>
                            <cmis:propertyInteger localName=""rep-
cmis:contentStreamLength"" propertyDefinitionId=""cmis:contentStreamLength"">
<cmis:value>4234</cmis:value>
                            </cmis:propertyInteger>
                            <cmis:propertyString displayName=""Keywords for
Document"" localName=""keywords"" propertyDefinitionId=""keywords"">
<cmis:value>document</cmis:value>
<cmis:value>example</cmis:value>
<cmis:value>sample</cmis:value>
<cmis:value>cmis</cmis:value>
                            </cmis:propertyString>
                        </cmis:properties>
                    </cmisra:object>
                    <cmisra:pathSegment>invoice1.pdf</cmisra:pathSegment>
                </atom:entry>
            </atom:feed>
        </cmisra:children>
    </atom:entry>
</atom:feed>
```

Please also see the example documents included with the schema.

3.9.3.1 GET

The following arguments may be supplied. Please see the domain model for more information:

- filter
- depth
- includeAllowableActions
- includeRelationships
- renditionFilter
- includePathSegment

3.9.3.2 DELETE

This deletes the folder and all sub-folders. The following arguments may be supplied. Please see the domain model for more information:

- continueOnFailure
- unfileObjects

Status Code:

- 200 OK if successful. Body contains entity describing the status
- 202 Accepted, if accepted but deletion not yet taking place
- 204 No Content, if successful with no content
- 403 Forbidden, if permission is denied
- 401 Unauthorized, if not authenticated
- 500 Internal Server Error. The body SHOULD contain an entity describing the status

If the delete method does not delete all items, invoking GET with infinite depth on this URI will return the items not deleted. Subsequent DELETE methods can be invoked on this URI.

Note: If the repository does not implement get on this resource, or the canGetDescendants is false, there is no mechanism to identify the resources that were not removed.

3.9.4 Folder Tree

This is a hierarchical feed comprising all the folders under a specified folder. This is available via the link relation foldertree with media type application/atom+xml;type=feed. Please see the Hierarchical Atom Entries for more information on format.

CMIS Services:

GET: getFolderTree

DELETE: deleteTree

Media Type: application/atom +xml;type=feed

Link Relations:

- service: Points to service document containing the CMIS repository. The service document MUST contain only one workspace element.
  - Media Type: application/atomsvc+xml
- via: points to the atom entry of the folder generating this collection
- up: points to the atom entry document of this folder~~’~~'s parent
  - If the root folder, this link relation MUST not be included.
  - Media Type: application/atom+xml;type=entry
- down:
  - application/atom+xml : Points to the atom feed document representing the children feed for this same folder
  - application/cmistree+xml: Points to the descendants feed of the same folder. If a repository does not support capabilityGetDescendants, then this link SHOULD NOT be included.
- paging link relations MAY be included as appropriate: first, next, previous, last
  - Repositories may support these paging link relations on a particular cmisra:children element.

This feed contains a set of atom entries for each sub-folder in the folder.

The following CMIS Atom extension element MAY be included inside the atom feed:

- cmisra:numItems

The following CMIS Atom extension element MUST be included inside the atom entries:

- cmisra:object inside atom:entry
- cmisra:pathSegment inside atom:entry
- cmisra:children inside atom:entry

Example:

```
<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<atom:feed xmlns:cmis=""http://docs.oasis-open.org/ns/cmis/core/200908/""
xmlns:cmism=""http://docs.oasis-open.org/ns/cmis/messaging/200908/""
xmlns:atom=""http://www.w3.org/2005/Atom""
xmlns:app=""http://www.w3.org/2007/app"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:title type=""text"">FolderTree Feed of Folder1</atom:title>
    <atom:author>
        <atom:name>Al Brown</atom:name>
        <atom:uri>http://www.ibm.com/</atom:uri>
        <atom:email>albertcbrown@us.ibm.com</atom:email>
    </atom:author>
    <atom:updated>2010-01-25T10:20:59.521-08:00</atom:updated>
    <atom:id>urn:uuid:f87e5678-dd24-4214-9e71-635f060beb7d</atom:id>
    <atom:link type=""application/atom+xml;type=feed"" rel=""self""
href=""http://cmisexample.oasis-open.org/rep1/6e327a3c-a246-4cee-8176-
b65edc3e1854/3""/>
    <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
    <atom:link type=""application/atom+xml;type=entry"" rel=""via""
href=""http://cmisexample.oasis-open.org/rep1/6e327a3c-a246-4cee-8176-
b65edc3e1854""/>
    <atom:link type=""application/cmistree+xml"" rel=""down""
href=""http://cmisexample.oasis-open.org/rep1/6e327a3c-a246-4cee-8176-
b65edc3e1854/tree""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""down""
href=""http://cmisexample.oasis-open.org/rep1/6e327a3c-a246-4cee-8176-
b65edc3e1854/children""/>
    <atom:link type=""application/atom+xml;type=entry"" rel=""up""
href=""http://cmisexample.oasis-open.org/rep1/3056c4d7-4e16-49cb-a750-
ad7a3844a1aa""/>
    <cmisra:numItems>1</cmisra:numItems>
    <atom:entry>
        <atom:author>
            <atom:name>Al Brown</atom:name>
            <atom:uri>http://www.ibm.com/</atom:uri>
            <atom:email>albertcbrown@us.ibm.com</atom:email>
        </atom:author>
        <atom:content src=""http://cmisexample.oasis-open.org/rep1/c7b5a83e-
37b6-4f5a-b646-50892252a180""/>
        <atom:id>urn:uuid:c7b5a83e-37b6-4f5a-b646-50892252a180</atom:id>
        <atom:title type=""text"">Customer Folder</atom:title>
        <atom:updated>2010-01-25T10:20:59.521-08:00</atom:updated>
        <atom:link rel=""self"" href=""http://cmisexample.oasis-
open.org/rep1/c7b5a83e-37b6-4f5a-b646-50892252a180""/>
        <atom:link rel=""edit"" href=""http://cmisexample.oasis-
open.org/rep1/c7b5a83e-37b6-4f5a-b646-50892252a180""/>
```

```
        <atom:link type=""application/cmis+xml;type=allowableActions""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/allowableactions""
href=""http://cmisexample.oasis-open.org/rep1/c7b5a83e-37b6-4f5a-b646-
50892252a180/allowableactions""/>
        <atom:link type=""application/atom+xml;type=entry""
rel=""describedby"" href=""http://cmisexample.oasis-open.org/rep1/c7b5a83e-
37b6-4f5a-b646-50892252a180/type""/>
        <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
        <atom:published>2010-01-25T10:20:59.521-08:00</atom:published>
        <atom:summary type=""html"">HTML summary of Entry  c7b5a83e-37b6-4f5a-
b646-50892252a180</atom:summary>
        <atom:link type=""application/atom+xml;type=entry"" rel=""up""
href=""http://cmisexample.oasis-open.org/rep1/c7b5a83e-37b6-4f5a-b646-
50892252a180/up""/>
        <atom:link type=""application/atom+xml;type=feed"" rel=""down""
href=""http://cmisexample.oasis-open.org/rep1/c7b5a83e-37b6-4f5a-b646-
50892252a180/children""/>
        <atom:link type=""application/cmistree+xml"" rel=""down""
href=""http://cmisexample.oasis-open.org/rep1/c7b5a83e-37b6-4f5a-b646-
50892252a180/tree""/>
        <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/foldertree""
href=""http://cmisexample.oasis-open.org/rep1/c7b5a83e-37b6-4f5a-b646-
50892252a180/foldertree""/>
        <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/relationships""
href=""http://cmisexample.oasis-open.org/rep1/c7b5a83e-37b6-4f5a-b646-
50892252a180/relationships""/>
        <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/policies""
href=""http://cmisexample.oasis-open.org/rep1/c7b5a83e-37b6-4f5a-b646-
50892252a180/policies""/>
        <atom:link type=""application/cmisacl+xml"" rel=""http://docs.oasis-
open.org/ns/cmis/link/200908/acl"" href=""http://cmisexample.oasis-
open.org/rep1/c7b5a83e-37b6-4f5a-b646-50892252a180/acl""/>
        <cmisra:object>
            <cmis:properties>
                <cmis:propertyId localName=""rep-cmis:objectId""
propertyDefinitionId=""cmis:objectId"">
                    <cmis:value>c7b5a83e-37b6-4f5a-b646-
50892252a180</cmis:value>
                </cmis:propertyId>
                <cmis:propertyId localName=""rep-cmis:objectTypeId""
propertyDefinitionId=""cmis:objectTypeId"">
                    <cmis:value>customer</cmis:value>
                </cmis:propertyId>
                <cmis:propertyString localName=""rep-cmis:name""
propertyDefinitionId=""cmis:name"">
                    <cmis:value>Customer Folder</cmis:value>
                </cmis:propertyString>
                <cmis:propertyDateTime localName=""rep-cmis:creationDate""
propertyDefinitionId=""cmis:creationDate"">
                    <cmis:value>2010-01-25T10:20:59.521-08:00</cmis:value>
                </cmis:propertyDateTime>
                <cmis:propertyDateTime localName=""rep-
cmis:lastModificationDate""
propertyDefinitionId=""cmis:lastModificationDate"">
                    <cmis:value>2010-01-25T10:20:59.521-08:00</cmis:value>
                </cmis:propertyDateTime>
                <cmis:propertyId localName=""rep-cmis:baseTypeId""
propertyDefinitionId=""cmis:baseTypeId"">
                    <cmis:value>cmis:folder</cmis:value>
                </cmis:propertyId>
                <cmis:propertyString localName=""rep-cmis:lastModifiedBy"" propertyDefinitionId=""cmis:lastModifiedBy"">
                    <cmis:value>Al Brown</cmis:value>
                </cmis:propertyString>
                <cmis:propertyString localName=""rep-cmis:createdBy"" propertyDefinitionId=""cmis:createdBy"">
                    <cmis:value>Al Brown</cmis:value>
                </cmis:propertyString>
                <cmis:propertyId localName=""rep-cmis:parentId"" propertyDefinitionId=""cmis:parentId"">
                    <cmis:value>c7b5a83e-37b6-4f5a-b646-50892252a180up</cmis:value>
                </cmis:propertyId>
            </cmis:properties>
        </cmisra:object>
        <cmisra:pathSegment>customer</cmisra:pathSegment>
    </atom:entry>
</atom:feed>
```

Please also see the example documents included with the schema.

3.9.4.1 GET

The following arguments may be supplied. Please see the domain model for more information:

- filter
- depth
- includeAllowableActions
- includeRelationships
- renditionFilter

3.9.4.2 DELETE

This is the same as DELETE on Folder Descendants. Please see that section.

3.9.5 AllVersions Feed

This is a feed comprised of all the versions of the given document.

CMIS Services:

GET: getAllVersions

DELETE: deleteAllVersions

Media Type: application/atom+xml;type=feed

The feed SHOULD contain the newest versions at the beginning of the feed.

Link Relations:

- service: Points to service document containing the CMIS repository. The service document MUST contain only one workspace element.
    - Media Type: application/atomsvc+xml
- via: points to the atom entry of the resource generating this collection
- paging link relations as appropriate: first, next, previous, last

This feed contains a set of atom entries for each version in the version series

- cmisra:object inside atom:entry
- cmisra:children inside atom:entry if atom:entry represents a CMIS Folder

Example:

```
<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<atom:feed xmlns:cmis=""http://docs.oasis-open.org/ns/cmis/core/200908/""
xmlns:cmism=""http://docs.oasis-open.org/ns/cmis/messaging/200908/""
xmlns:atom=""http://www.w3.org/2005/Atom""
xmlns:app=""http://www.w3.org/2007/app"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:title type=""text"">AllVersions for Document e8abd7cd-b9ec-4dba-
9eaa-1bce2ae9977f</atom:title>
    <atom:author>
        <atom:name>Al Brown</atom:name>
        <atom:uri>http://www.ibm.com/</atom:uri>
        <atom:email>albertcbrown@us.ibm.com</atom:email>
    </atom:author>
    <atom:updated>2010-01-25T10:20:58.896-08:00</atom:updated>
    <atom:id>urn:uuid:5dc3d1c1-3e85-4720-acf8-cf98c96a5830</atom:id>
    <atom:link type=""application/atom+xml;type=feed"" rel=""self""
href=""http://cmisexample.oasis-open.org/rep1/e8abd7cd-b9ec-4dba-9eaa-
1bce2ae9977f/3""/>
    <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
    <atom:link type=""application/atom+xml;type=entry"" rel=""via""
href=""http://cmisexample.oasis-open.org/rep1/e8abd7cd-b9ec-4dba-9eaa-
1bce2ae9977f""/>
    <cmisra:numItems>1</cmisra:numItems>
    <atom:entry>
        <atom:author>
            <atom:name>Al Brown</atom:name>
            <atom:uri>http://www.ibm.com/</atom:uri>
            <atom:email>albertcbrown@us.ibm.com</atom:email>
        </atom:author>
        <atom:content src=""http://cmisexample.oasis-open.org/rep1/197033f2-
ac11-4911-b5a3-60781fa5c281""/>
        <atom:id>urn:uuid:197033f2-ac11-4911-b5a3-60781fa5c281</atom:id>
        <atom:title type=""text"">Invoice (Version1)</atom:title>
        <atom:updated>2010-01-25T10:20:58.896-08:00</atom:updated>
        <atom:link rel=""self"" href=""http://cmisexample.oasis-
open.org/rep1/197033f2-ac11-4911-b5a3-60781fa5c281""/>
        <atom:link rel=""edit"" href=""http://cmisexample.oasis-
open.org/rep1/197033f2-ac11-4911-b5a3-60781fa5c281""/>
        <atom:link type=""application/cmis+xml;type=allowableActions""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/allowableactions""
href=""http://cmisexample.oasis-open.org/rep1/197033f2-ac11-4911-b5a3-
60781fa5c281/allowableactions""/>
        <atom:link type=""application/atom+xml;type=entry""
rel=""describedby"" href=""http://cmisexample.oasis-open.org/rep1/197033f2-
ac11-4911-b5a3-60781fa5c281/type""/>
        <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
        <atom:published>2010-01-25T10:20:58.896-08:00</atom:published>
        <atom:summary type=""html"">HTML summary of Entry  197033f2-ac11-4911-
b5a3-60781fa5c281</atom:summary>
        <atom:link rel=""edit-media"" href=""http://cmisexample.oasis-
open.org/rep1/197033f2-ac11-4911-b5a3-60781fa5c281/edit-media""/>
        <atom:link rel=""alternate"" href=""http://cmisexample.oasis-
open.org/rep1/197033f2-ac11-4911-b5a3-60781fa5c281/alternate""/>
        <atom:link type=""application/atom+xml;type=feed"" rel=""up""
href=""http://cmisexample.oasis-open.org/rep1/197033f2-ac11-4911-b5a3-
60781fa5c281/parents""/>
```

```
        <atom:link type=""application/atom+xml;type=feed"" rel=""version-
history"" href=""http://cmisexample.oasis-open.org/rep1/197033f2-ac11-4911-
b5a3-60781fa5c281/allversions""/>
        <atom:link type=""application/atom+xml;type=entry"" rel=""current-
version"" href=""http://cmisexample.oasis-open.org/rep1/197033f2-ac11-4911-
b5a3-60781fa5c281/latest""/>
        <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/relationships""
href=""http://cmisexample.oasis-open.org/rep1/197033f2-ac11-4911-b5a3-
60781fa5c281/relationships""/>
        <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/policies""
href=""http://cmisexample.oasis-open.org/rep1/197033f2-ac11-4911-b5a3-
60781fa5c281/policies""/>
        <atom:link type=""application/cmisacl+xml"" rel=""http://docs.oasis-
open.org/ns/cmis/link/200908/acl"" href=""http://cmisexample.oasis-
open.org/rep1/197033f2-ac11-4911-b5a3-60781fa5c281/acl""/>
        <cmisra:object>
            <cmis:properties>
                <cmis:propertyId localName=""rep-cmis:objectId""
propertyDefinitionId=""cmis:objectId"">
                    <cmis:value>197033f2-ac11-4911-b5a3-
60781fa5c281</cmis:value>
                </cmis:propertyId>
            </cmis:properties>
        </cmisra:object>
    </atom:entry>
</atom:feed>
```

Please also see the example documents included with the schema.

3.9.5.1 GET

The following arguments may be supplied. Please see the domain model for more information:

- filter
- includeAllowableActions

3.9.5.2 DELETE

This removes the entire version history of the document.

Success HTTP code: 204

3.9.6 Type Descendants Feed

This is a feed described in the service document that contains all the types under a specific type in the repository to a specific depth. If no parent type is specified, then the base types and their descendants are returned in the feed which is equivalent to all types in the repository if depth is infinite. The link relation is *http://docs.oasis-open.org/ns/cmis/link/200908/typedescendants.*

Types are nested using the CMIS hierarchy extension. Please see section 3.4.3.2 Hierarchy Navigation Internet Draft Link Relations~~Hierarchy Navigation Internet Draft Link Relations~~.

CMIS Services:

GET: getTypeDescendants

Media Type: application/atom+xml;type=feed

Link Relations:

- service: Points to service document containing the CMIS repository. The service document MUST contain only one workspace element.
    - Media Type: application/atomsvc+xml
- via: points to the type definition whose descendents represent this feed. This link is not present if no parent type is specified.
- down: points to the children feed for the same type
- up: points to the parent type definition
    - If this is a descendants feed for a base object type, this link is not present.

The following CMIS Atom extension element MAY be included inside the atom feed:

- cmisra:numItems

Example:

```
<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<atom:feed xmlns:cmis=""http://docs.oasis-open.org/ns/cmis/core/200908/""
xmlns:cmism=""http://docs.oasis-open.org/ns/cmis/messaging/200908/""
xmlns:atom=""http://www.w3.org/2005/Atom""
xmlns:app=""http://www.w3.org/2007/app"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:title type=""text"">Base Types</atom:title>
    <atom:author>
        <atom:name>Al Brown</atom:name>
        <atom:uri>http://www.ibm.com/</atom:uri>
        <atom:email>albertcbrown@us.ibm.com</atom:email>
    </atom:author>
    <atom:updated>2010-01-25T10:20:59.911-08:00</atom:updated>
    <atom:id>urn:uuid:c5d3d357-33ec-47c1-8436-563e0d94d2e5</atom:id>
    <atom:link type=""application/atom+xml;type=feed"" rel=""self""
href=""http://cmisexample.oasis-open.org/rep1//3""/>
    <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
    <atom:link type=""application/atom+xml;type=entry"" rel=""via""
href=""http://cmisexample.oasis-open.org/rep1/""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""down""
href=""http://cmisexample.oasis-open.org/rep1//children""/>
    <cmisra:numItems>1</cmisra:numItems>
    <atom:entry>
        <atom:author>
            <atom:name>Al Brown</atom:name>
            <atom:uri>http://www.ibm.com/</atom:uri>
            <atom:email>albertcbrown@us.ibm.com</atom:email>
        </atom:author>
        <atom:content>Type Definition for cmis:document</atom:content>
        <atom:id>http://cmisexample.oasis-
open.org/rep1/type/cmis:document</atom:id>
        <atom:link type=""application/atom+xml;type=entry"" rel=""self""
href=""http://cmisexample.oasis-open.org/rep1/type/cmis:document""/>
        <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1/type/cmis:document""/>
        <atom:link type=""application/atom+xml;type=entry""
rel=""describedby"" href=""http://cmisexample.oasis-
open.org/rep1/type/cmis:document""/>
        <atom:link type=""application/atom+xml;type=entry"" rel=""up""
href=""http://cmisexample.oasis-open.org/rep1/type/cmis:document/parent""/>
```

```
        <atom:link type=""application/atom+xml;type=feed"" rel=""down""
href=""http://cmisexample.oasis-
open.org/rep1/type/cmis:document/children/flat""/>
        <atom:link type=""application/cmistree+xml"" rel=""down""
href=""http://cmisexample.oasis-
open.org/rep1/type/cmis:document/children/tree""/>
        <atom:published>2010-01-25T10:20:59.927-08:00</atom:published>
        <atom:summary type=""html"">HTML summary of Type Definition
cmis:document</atom:summary>
        <atom:title type=""text"">Type Definition - cmis:document</atom:title>
        <atom:updated>2010-01-25T10:20:59.927-08:00</atom:updated>
        <app:edited>2010-01-25T10:20:59.927-08:00</app:edited>
        <cmisra:type xmlns:xsi=""http://www.w3.org/2001/XMLSchema-instance""
xsi:type=""cmis:cmisTypeDocumentDefinitionType"" cmisra:id=""cmis:document"">
            <cmis:id>dtcmis:document</cmis:id>
            <cmis:localName>myrepname-cmis:document</cmis:localName>
            <cmis:localNamespace xsi:nil=""true""/>
            <cmis:displayName>cmis:document</cmis:displayName>
            <cmis:queryName>cmis:document</cmis:queryName>
            <cmis:description>Description for type definition
cmis:document</cmis:description>
            <cmis:baseId>cmis:document</cmis:baseId>
            <cmis:parentId>parent</cmis:parentId>
            <cmis:creatable>true</cmis:creatable>
            <cmis:fileable>true</cmis:fileable>
            <cmis:queryable>false</cmis:queryable>
            <cmis:fulltextIndexed>false</cmis:fulltextIndexed>

<cmis:includedInSupertypeQuery>true</cmis:includedInSupertypeQuery>
            <cmis:controllablePolicy>true</cmis:controllablePolicy>
            <cmis:controllableACL>true</cmis:controllableACL>
            <cmis:versionable>true</cmis:versionable>
            <cmis:contentStreamAllowed>allowed</cmis:contentStreamAllowed>
        </cmisra:type>
        <cmisra:children>
            <atom:feed>
                <atom:title type=""text"">Children for Document</atom:title>
                <atom:author>
                    <atom:name>Al Brown</atom:name>
                    <atom:uri>http://www.ibm.com/</atom:uri>
                    <atom:email>albertcbrown@us.ibm.com</atom:email>
                </atom:author>
                <atom:updated>2010-01-25T10:20:59.927-08:00</atom:updated>
                <atom:id>urn:uuid:6f1cdc44-bd89-41c0-8fad-
89f3ad0f8f30</atom:id>
                <atom:link type=""application/atom+xml;type=feed""
rel=""self"" href=""http://cmisexample.oasis-open.org/rep1/cmis:document/3""/>
                <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
                <atom:link type=""application/atom+xml;type=entry""
rel=""via"" href=""http://cmisexample.oasis-open.org/rep1/cmis:document""/>
                <atom:link type=""application/atom+xml;type=feed""
rel=""down"" href=""http://cmisexample.oasis-
open.org/rep1/cmis:document/children""/>
                <atom:link type=""application/atom+xml;type=entry"" rel=""up""
href=""http://cmisexample.oasis-open.org/rep1/document""/>
                <cmisra:numItems>1</cmisra:numItems>
                <atom:entry>
                    <atom:author>
                        <atom:name>Al Brown</atom:name>
                        <atom:uri>http://www.ibm.com/</atom:uri>
                        <atom:email>albertcbrown@us.ibm.com</atom:email>
                    </atom:author>
                    <atom:content>Type Definition for invoice-
document</atom:content>
                    <atom:id>http://cmisexample.oasis-
open.org/rep1/type/invoice-document</atom:id>
                    <atom:link type=""application/atom+xml;type=entry""
rel=""self"" href=""http://cmisexample.oasis-open.org/rep1/type/invoice-
document""/>
                    <atom:link type=""application/atomsvc+xml""
rel=""service"" href=""http://cmisexample.oasis-open.org/rep1/type/invoice-
document""/>
                    <atom:link type=""application/atom+xml;type=entry""
rel=""describedby"" href=""http://cmisexample.oasis-
open.org/rep1/type/cmis:document""/>
                    <atom:link type=""application/atom+xml;type=entry""
rel=""up"" href=""http://cmisexample.oasis-open.org/rep1/type/invoice-
document/parent""/>
                    <atom:link type=""application/atom+xml;type=feed""
rel=""down"" href=""http://cmisexample.oasis-open.org/rep1/type/invoice-
document/children/flat""/>
                    <atom:link type=""application/cmistree+xml"" rel=""down""
href=""http://cmisexample.oasis-open.org/rep1/type/invoice-
document/children/tree""/>
                    <atom:published>2010-01-25T10:20:59.927-
08:00</atom:published>
                    <atom:summary type=""html"">HTML summary of Type
Definition  invoice-document</atom:summary>
                    <atom:title type=""text"">Type Definition - invoice-
document</atom:title>
                    <atom:updated>2010-01-25T10:20:59.927-08:00</atom:updated>
                    <app:edited>2010-01-25T10:20:59.927-08:00</app:edited>
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instance"" xsi:type=""cmis:cmisTypeDocumentDefinitionType""
cmisra:id=""invoice-document"">
                        <cmis:id>dtinvoice-document</cmis:id>
                        <cmis:localName>myrepname-invoice-
document</cmis:localName>
                        <cmis:localNamespace xsi:nil=""true""/>
                        <cmis:displayName>invoice-document</cmis:displayName>
                        <cmis:queryName>invoice-document</cmis:queryName>
                        <cmis:description>Description for type definition
invoice-document</cmis:description>
                        <cmis:baseId>cmis:document</cmis:baseId>
                        <cmis:parentId>parent</cmis:parentId>
                        <cmis:creatable>true</cmis:creatable>
                        <cmis:fileable>true</cmis:fileable>
                        <cmis:queryable>false</cmis:queryable>
                        <cmis:fulltextIndexed>false</cmis:fulltextIndexed>

<cmis:includedInSupertypeQuery>true</cmis:includedInSupertypeQuery>

<cmis:controllablePolicy>true</cmis:controllablePolicy>
                        <cmis:controllableACL>true</cmis:controllableACL>
                        <cmis:versionable>true</cmis:versionable>

<cmis:contentStreamAllowed>allowed</cmis:contentStreamAllowed>
                    </cmisra:type>
                </atom:entry>
            </atom:feed>
        </cmisra:children>
    </atom:entry>
    <atom:entry>
        <atom:author>
            <atom:name>Al Brown</atom:name>
            <atom:uri>http://www.ibm.com/</atom:uri>
            <atom:email>albertcbrown@us.ibm.com</atom:email>
        </atom:author>
        <atom:content>Type Definition for cmis:folder</atom:content>
        <atom:id>http://cmisexample.oasis-
open.org/rep1/type/cmis:folder</atom:id>
        <atom:link type=""application/atom+xml;type=entry"" rel=""self""
href=""http://cmisexample.oasis-open.org/rep1/type/cmis:folder""/>
        <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1/type/cmis:folder""/>
        <atom:link type=""application/atom+xml;type=entry""
rel=""describedby"" href=""http://cmisexample.oasis-
open.org/rep1/type/cmis:folder""/>
        <atom:link type=""application/atom+xml;type=entry"" rel=""up""
href=""http://cmisexample.oasis-open.org/rep1/type/cmis:folder/parent""/>
        <atom:link type=""application/atom+xml;type=feed"" rel=""down""
href=""http://cmisexample.oasis-
open.org/rep1/type/cmis:folder/children/flat""/>
        <atom:link type=""application/cmistree+xml"" rel=""down""
href=""http://cmisexample.oasis-
open.org/rep1/type/cmis:folder/children/tree""/>
        <atom:published>2010-01-25T10:20:59.927-08:00</atom:published>
        <atom:summary type=""html"">HTML summary of Type Definition
cmis:folder</atom:summary>
        <atom:title type=""text"">Type Definition - cmis:folder</atom:title>
        <atom:updated>2010-01-25T10:20:59.927-08:00</atom:updated>
        <app:edited>2010-01-25T10:20:59.927-08:00</app:edited>
        <cmisra:type xmlns:xsi=""http://www.w3.org/2001/XMLSchema-instance""
xsi:type=""cmis:cmisTypeFolderDefinitionType"" cmisra:id=""cmis:folder"">
            <cmis:id>dtcmis:folder</cmis:id>
            <cmis:localName>myrepname-cmis:folder</cmis:localName>
            <cmis:localNamespace xsi:nil=""true""/>
            <cmis:displayName>cmis:folder</cmis:displayName>
            <cmis:queryName>cmis:folder</cmis:queryName>
            <cmis:description>Description for type definition
cmis:folder</cmis:description>
            <cmis:baseId>cmis:folder</cmis:baseId>
            <cmis:parentId>parent</cmis:parentId>
            <cmis:creatable>true</cmis:creatable>
            <cmis:fileable>true</cmis:fileable>
            <cmis:queryable>false</cmis:queryable>
            <cmis:fulltextIndexed>false</cmis:fulltextIndexed>

<cmis:includedInSupertypeQuery>true</cmis:includedInSupertypeQuery>
            <cmis:controllablePolicy>true</cmis:controllablePolicy>
            <cmis:controllableACL>true</cmis:controllableACL>
        </cmisra:type>
        <cmisra:children>
            <atom:feed>
                <atom:title type=""text"">Children for Folder</atom:title>
                <atom:author>
                    <atom:name>Al Brown</atom:name>
                    <atom:uri>http://www.ibm.com/</atom:uri>
                    <atom:email>albertcbrown@us.ibm.com</atom:email>
                </atom:author>
                <atom:updated>2010-01-25T10:20:59.927-08:00</atom:updated>
                <atom:id>urn:uuid:361a3ac1-f7f7-47cb-b941-
ae1200213fe0</atom:id>
                <atom:link type=""application/atom+xml;type=feed""
rel=""self"" href=""http://cmisexample.oasis-open.org/rep1/cmis:folder/3""/>
                <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
                <atom:link type=""application/atom+xml;type=entry""
rel=""via"" href=""http://cmisexample.oasis-open.org/rep1/cmis:folder""/>
```

```
                <atom:link type=""application/atom+xml;type=feed""
rel=""down"" href=""http://cmisexample.oasis-
open.org/rep1/cmis:folder/children""/>
                <atom:link type=""application/atom+xml;type=entry"" rel=""up""
href=""http://cmisexample.oasis-open.org/rep1/cmis:folder""/>
                <cmisra:numItems>1</cmisra:numItems>
                <atom:entry>
                    <atom:author>
                        <atom:name>Al Brown</atom:name>
                        <atom:uri>http://www.ibm.com/</atom:uri>
                        <atom:email>albertcbrown@us.ibm.com</atom:email>
                    </atom:author>
                    <atom:content>Type Definition for customer-
folder</atom:content>
                    <atom:id>http://cmisexample.oasis-
open.org/rep1/type/customer-folder</atom:id>
                    <atom:link type=""application/atom+xml;type=entry""
rel=""self"" href=""http://cmisexample.oasis-open.org/rep1/type/customer-
folder""/>
                    <atom:link type=""application/atomsvc+xml""
rel=""service"" href=""http://cmisexample.oasis-open.org/rep1/type/customer-
folder""/>
                    <atom:link type=""application/atom+xml;type=entry""
rel=""describedby"" href=""http://cmisexample.oasis-
open.org/rep1/type/cmis:folder""/>
                    <atom:link type=""application/atom+xml;type=entry""
rel=""up"" href=""http://cmisexample.oasis-open.org/rep1/type/customer-
folder/parent""/>
                    <atom:link type=""application/atom+xml;type=feed""
rel=""down"" href=""http://cmisexample.oasis-open.org/rep1/type/customer-
folder/children/flat""/>
                    <atom:link type=""application/cmistree+xml"" rel=""down""
href=""http://cmisexample.oasis-open.org/rep1/type/customer-
folder/children/tree""/>
                    <atom:published>2010-01-25T10:20:59.927-
08:00</atom:published>
                    <atom:summary type=""html"">HTML summary of Type
Definition  customer-folder</atom:summary>
                    <atom:title type=""text"">Type Definition - customer-
folder</atom:title>
                    <atom:updated>2010-01-25T10:20:59.927-08:00</atom:updated>
                    <app:edited>2010-01-25T10:20:59.927-08:00</app:edited>
                    <cmisra:type xmlns:xsi=""http://www.w3.org/2001/XMLSchema-
instance"" xsi:type=""cmis:cmisTypeFolderDefinitionType""
cmisra:id=""customer-folder"">
                        <cmis:id>dtcustomer-folder</cmis:id>
                        <cmis:localName>myrepname-customer-
folder</cmis:localName>
                        <cmis:localNamespace xsi:nil=""true""/>
                        <cmis:displayName>customer-folder</cmis:displayName>
                        <cmis:queryName>customer-folder</cmis:queryName>
                        <cmis:description>Description for type definition
customer-folder</cmis:description>
                        <cmis:baseId>cmis:folder</cmis:baseId>
                        <cmis:parentId>parent</cmis:parentId>
                        <cmis:creatable>true</cmis:creatable>
                        <cmis:fileable>true</cmis:fileable>
                        <cmis:queryable>false</cmis:queryable>
                        <cmis:fulltextIndexed>false</cmis:fulltextIndexed>

<cmis:includedInSupertypeQuery>true</cmis:includedInSupertypeQuery>

<cmis:controllablePolicy>true</cmis:controllablePolicy>
                        <cmis:controllableACL>true</cmis:controllableACL>
                    </cmisra:type>
                </atom:entry>
            </atom:feed>
        </cmisra:children>
    </atom:entry>
    <atom:entry>
        <atom:author>
            <atom:name>Al Brown</atom:name>
            <atom:uri>http://www.ibm.com/</atom:uri>
            <atom:email>albertcbrown@us.ibm.com</atom:email>
        </atom:author>
        <atom:content>Type Definition for cmis:relationship</atom:content>
        <atom:id>http://cmisexample.oasis-
open.org/rep1/type/cmis:relationship</atom:id>
        <atom:link type=""application/atom+xml;type=entry"" rel=""self""
href=""http://cmisexample.oasis-open.org/rep1/type/cmis:relationship""/>
        <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1/type/cmis:relationship""/>
        <atom:link type=""application/atom+xml;type=entry""
rel=""describedby"" href=""http://cmisexample.oasis-
open.org/rep1/type/cmis:relationship""/>
        <atom:link type=""application/atom+xml;type=entry"" rel=""up""
href=""http://cmisexample.oasis-
open.org/rep1/type/cmis:relationship/parent""/>
        <atom:link type=""application/atom+xml;type=feed"" rel=""down""
href=""http://cmisexample.oasis-
open.org/rep1/type/cmis:relationship/children/flat""/>
        <atom:link type=""application/cmistree+xml"" rel=""down""
href=""http://cmisexample.oasis-
open.org/rep1/type/cmis:relationship/children/tree""/>
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cmis:relationship</atom:title>
        <atom:updated>2010-01-25T10:20:59.943-08:00</atom:updated>
        <app:edited>2010-01-25T10:20:59.943-08:00</app:edited>
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xsi:type=""cmis:cmisTypeRelationshipDefinitionType""
cmisra:id=""cmis:relationship"">
            <cmis:id>dtcmis:relationship</cmis:id>
            <cmis:localName>myrepname-cmis:relationship</cmis:localName>
            <cmis:localNamespace xsi:nil=""true""/>
            <cmis:displayName>cmis:relationship</cmis:displayName>
            <cmis:queryName>cmis:relationship</cmis:queryName>
            <cmis:description>Description for type definition
cmis:relationship</cmis:description>
            <cmis:baseId>cmis:relationship</cmis:baseId>
            <cmis:parentId>parent</cmis:parentId>
            <cmis:creatable>true</cmis:creatable>
            <cmis:fileable>false</cmis:fileable>
            <cmis:queryable>false</cmis:queryable>
            <cmis:fulltextIndexed>false</cmis:fulltextIndexed>

<cmis:includedInSupertypeQuery>true</cmis:includedInSupertypeQuery>
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            <cmis:controllableACL>true</cmis:controllableACL>
            <cmis:allowedSourceTypes>invoice</cmis:allowedSourceTypes>
            <cmis:allowedSourceTypes>capitalinvoice</cmis:allowedSourceTypes>
            <cmis:allowedTargetTypes>customer</cmis:allowedTargetTypes>
        </cmisra:type>
        <cmisra:children>
            <atom:feed>
```

```
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Relationship</atom:title>
                <atom:author>
                    <atom:name>Al Brown</atom:name>
                    <atom:uri>http://www.ibm.com/</atom:uri>
                    <atom:email>albertcbrown@us.ibm.com</atom:email>
                </atom:author>
                <atom:updated>2010-01-25T10:20:59.943-08:00</atom:updated>
                <atom:id>urn:uuid:9394ff3d-87c4-48c9-a951-
ba725560faac</atom:id>
                <atom:link type=""application/atom+xml;type=feed"" 
rel=""self"" href=""http://cmisexample.oasis-
open.org/rep1/cmis:relationship/3""/>
                <atom:link type=""application/atomsvc+xml"" rel=""service"" 
href=""http://cmisexample.oasis-open.org/rep1//service""/>
                <atom:link type=""application/atom+xml;type=entry"" 
rel=""via"" href=""http://cmisexample.oasis-
open.org/rep1/cmis:relationship""/>
                <atom:link type=""application/atom+xml;type=feed"" 
rel=""down"" href=""http://cmisexample.oasis-
open.org/rep1/cmis:relationship/children""/>
                <atom:link type=""application/atom+xml;type=entry"" rel=""up"" 
href=""http://cmisexample.oasis-open.org/rep1/cmis:folder""/>
                <cmisra:numItems>1</cmisra:numItems>
                <atom:entry>
                    <atom:author>
                        <atom:name>Al Brown</atom:name>
                        <atom:uri>http://www.ibm.com/</atom:uri>
                        <atom:email>albertcbrown@us.ibm.com</atom:email>
                    </atom:author>
                    <atom:content>Type Definition for customer-
relationship</atom:content>
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open.org/rep1/type/customer-relationship</atom:id>
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rel=""self"" href=""http://cmisexample.oasis-open.org/rep1/type/customer-
relationship""/>
                    <atom:link type=""application/atomsvc+xml"" 
rel=""service"" href=""http://cmisexample.oasis-open.org/rep1/type/customer-
relationship""/>
                    <atom:link type=""application/atom+xml;type=entry"" 
rel=""describedby"" href=""http://cmisexample.oasis-
open.org/rep1/type/cmis:relationship""/>
                    <atom:link type=""application/atom+xml;type=entry"" 
rel=""up"" href=""http://cmisexample.oasis-open.org/rep1/type/customer-
relationship/parent""/>
                    <atom:link type=""application/atom+xml;type=feed"" 
rel=""down"" href=""http://cmisexample.oasis-open.org/rep1/type/customer-
relationship/children/flat""/>
                    <atom:link type=""application/cmistree+xml"" rel=""down"" 
href=""http://cmisexample.oasis-open.org/rep1/type/customer-
relationship/children/tree""/>
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08:00</atom:published>
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Definition  customer-relationship</atom:summary>
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relationship</atom:title>
                    <atom:updated>2010-01-25T10:20:59.943-08:00</atom:updated>
                    <app:edited>2010-01-25T10:20:59.943-08:00</app:edited>
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instance"" xsi:type=""cmis:cmisTypeRelationshipDefinitionType"" 
cmisra:id=""customer-relationship"">
                        <cmis:id>dtcustomer-relationship</cmis:id>
                        <cmis:localName>myrepname-customer-
relationship</cmis:localName>
                        <cmis:localNamespace xsi:nil=""true""/>
                        <cmis:displayName>customer-
relationship</cmis:displayName>
                        <cmis:queryName>customer-relationship</cmis:queryName>
                        <cmis:description>Description for type definition
customer-relationship</cmis:description>
                        <cmis:baseId>cmis:relationship</cmis:baseId>
                        <cmis:parentId>parent</cmis:parentId>
                        <cmis:creatable>true</cmis:creatable>
                        <cmis:fileable>false</cmis:fileable>
                        <cmis:queryable>false</cmis:queryable>
                        <cmis:fulltextIndexed>false</cmis:fulltextIndexed>

<cmis:includedInSupertypeQuery>true</cmis:includedInSupertypeQuery>

<cmis:controllablePolicy>true</cmis:controllablePolicy>
                        <cmis:controllableACL>true</cmis:controllableACL>

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<cmis:allowedSourceTypes>capitalinvoice</cmis:allowedSourceTypes>

<cmis:allowedTargetTypes>customer</cmis:allowedTargetTypes>
                    </cmisra:type>
                </atom:entry>
            </atom:feed>
        </cmisra:children>
    </atom:entry>
    <atom:entry>
        <atom:author>
            <atom:name>Al Brown</atom:name>
            <atom:uri>http://www.ibm.com/</atom:uri>
            <atom:email>albertcbrown@us.ibm.com</atom:email>
        </atom:author>
        <atom:content>Type Definition for cmis:policy</atom:content>
        <atom:id>http://cmisexample.oasis-
open.org/rep1/type/cmis:policy</atom:id>
        <atom:link type=""application/atom+xml;type=entry"" rel=""self""
href=""http://cmisexample.oasis-open.org/rep1/type/cmis:policy""/>
        <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1/type/cmis:policy""/>
        <atom:link type=""application/atom+xml;type=entry""
rel=""describedby"" href=""http://cmisexample.oasis-
open.org/rep1/type/cmis:policy""/>
        <atom:link type=""application/atom+xml;type=entry"" rel=""up""
href=""http://cmisexample.oasis-open.org/rep1/type/cmis:policy/parent""/>
        <atom:link type=""application/atom+xml;type=feed"" rel=""down""
href=""http://cmisexample.oasis-
open.org/rep1/type/cmis:policy/children/flat""/>
        <atom:link type=""application/cmistree+xml"" rel=""down""
href=""http://cmisexample.oasis-
open.org/rep1/type/cmis:policy/children/tree""/>
        <atom:published>2010-01-25T10:20:59.943-08:00</atom:published>
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cmis:policy</atom:summary>
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        <atom:updated>2010-01-25T10:20:59.943-08:00</atom:updated>
        <app:edited>2010-01-25T10:20:59.943-08:00</app:edited>
        <cmisra:type xmlns:xsi=""http://www.w3.org/2001/XMLSchema-instance""
xsi:type=""cmis:cmisTypePolicyDefinitionType"" cmisra:id=""cmis:policy"">
            <cmis:id>dtcmis:policy</cmis:id>
            <cmis:localName>myrepname-cmis:policy</cmis:localName>
            <cmis:localNamespace xsi:nil=""true""/>
            <cmis:displayName>cmis:policy</cmis:displayName>
            <cmis:queryName>cmis:policy</cmis:queryName>
            <cmis:description>Description for type definition
cmis:policy</cmis:description>
            <cmis:baseId>cmis:policy</cmis:baseId>
            <cmis:parentId>parent</cmis:parentId>
            <cmis:creatable>true</cmis:creatable>
            <cmis:fileable>false</cmis:fileable>
            <cmis:queryable>false</cmis:queryable>
            <cmis:fulltextIndexed>false</cmis:fulltextIndexed>

<cmis:includedInSupertypeQuery>true</cmis:includedInSupertypeQuery>
            <cmis:controllablePolicy>true</cmis:controllablePolicy>
            <cmis:controllableACL>true</cmis:controllableACL>
        </cmisra:type>
    </atom:entry>
</atom:feed>
```

Please also see the example documents included with the schema.

3.9.6.1 GET

The following arguments may be supplied. Please see the domain model for more information:

- includePropertyDefinitions
- depth

3.10 Resources

For any HTTP verb not specified on a resource,each implementation MAY chose to implement that HTTP verb in a repository-specific manner.

3.10.1 Type Entry

This represents a type definition in the repository. This is enclosed as an atom entry

CMIS Services:

GET: getTypeDefinition

Media Type: application/atom+xml;type=entry

Link Relations:

- service: Points to service document containing the CMIS repository. The service document MUST contain only one workspace element.
  - Media Type: application/atomsvc+xml
- up: Points to the parent type as atom entry if applicable
- down: Points to the children of this type as atom feed if applicable
  - (Children) Media Type: application/atom +xml;type=feed points to the atom feed document representing the children feed for this same type
  - (Descendants) Media Type: application/cmistree+xml points to the atom feed document representing the descendents feed for this same type
- describedby: Points to the type definition atom entry of the base type of this type definition.

The following CMIS Atom extension element MUST be included inside the atom entry:

- cmisra:type

3.10.1.1 GET

There are no optional arguments for this resource.

Request:

```
GET /obj/5070f89a-6f00-4acf-84e9-d8836a6c7d23 HTTP/1.1
Host: example.org

```

Response:

```
HTTP/1.1 200 Ok
Date: Mon, 25 Jan 2010 10:21:00 -0800
Content-Length: 2995
Content-Type: application/atom+xml;type=entry
Location: http://cmisexample.oasis-open.org/rep1/cmis:document


<?xml version="~~"~~1.0"~~"~~ encoding="~~"~~UTF-8"~~"~~ standalone="~~"~~yes"~~"~~?>
<atom:entry xmlns:app="~~"~~http://www.w3.org/2007/app"~~"~~
xmlns:atom="~~"~~http://www.w3.org/2005/Atom"~~"~~ xmlns:cmis="~~"~~http://docs.oasis-
open.org/ns/cmis/core/200908/"~~"~~ xmlns:cmism="~~"~~http://docs.oasis-
open.org/ns/cmis/messaging/200908/"~~"~~ xmlns:cmisra="~~"~~http://docs.oasis-
open.org/ns/cmis/restatom/200908/"~~"~~>
    <atom:author>
        <atom:name>Al Brown</atom:name>
        <atom:uri>http://www.ibm.com/</atom:uri>
        <atom:email>albertcbrown@us.ibm.com</atom:email>
    </atom:author>
    <atom:content>Type Definition for cmis:document</atom:content>
    <atom:id>http://cmisexample.oasis-
open.org/rep1/type/cmis:document</atom:id>
    <atom:link type="~~"~~application/atom+xml;type=entry"~~"~~ rel="~~"~~self"~~"~~
href="~~"~~http://cmisexample.oasis-open.org/rep1/type/cmis:document"~~"~~/>
    <atom:link type="~~"~~application/atomsvc+xml"~~"~~ rel="~~"~~service"~~"~~
href="~~"~~http://cmisexample.oasis-open.org/rep1/type/cmis:document"~~"~~/>
    <atom:link type="~~"~~application/atom+xml;type=entry"~~"~~ rel="~~"~~describedby"~~"~~
href="~~"~~http://cmisexample.oasis-open.org/rep1/type/cmis:document"~~"~~/>
    <atom:link type="~~"~~application/atom+xml;type=entry"~~"~~ rel="~~"~~up"~~"~~
href="~~"~~http://cmisexample.oasis-open.org/rep1/type/cmis:document/parent"~~"~~/>
    <atom:link type="~~"~~application/atom+xml;type=feed"~~"~~ rel="~~"~~down"~~"~~
href="~~"~~http://cmisexample.oasis-
open.org/rep1/type/cmis:document/children/flat"~~"~~/>
    <atom:link type="~~"~~application/cmistree+xml"~~"~~ rel="~~"~~down"~~"~~
href="~~"~~http://cmisexample.oasis-
open.org/rep1/type/cmis:document/children/tree"~~"~~/>
    <atom:published>2010-01-25T10:21:00.380-08:00</atom:published>
    <atom:summary type="~~"~~html"~~"~~>HTML summary of Type Definition
cmis:document</atom:summary>
    <atom:title type="~~"~~text"~~"~~>Type Definition - cmis:document</atom:title>
    <atom:updated>2010-01-25T10:21:00.380-08:00</atom:updated>
    <app:edited>2010-01-25T10:21:00.380-08:00</app:edited>
    <cmisra:type xsi:type="~~"~~cmis:cmisTypeDocumentDefinitionType"~~"~~
cmisra:id="~~"~~cmis:document"~~"~~ xmlns:xsi="~~"~~http://www.w3.org/2001/XMLSchema-
instance"~~"~~>
        <cmis:id>dtcmis:document</cmis:id>
        <cmis:localName>myrepname-cmis:document</cmis:localName>
        <cmis:localNamespace xsi:nil="~~"~~true"~~"~~/>
        <cmis:displayName>cmis:document</cmis:displayName>
        <cmis:queryName>cmis:document</cmis:queryName>
        <cmis:description>Description for type definition
cmis:document</cmis:description>
        <cmis:baseId>cmis:document</cmis:baseId>
        <cmis:parentId>parent</cmis:parentId>
        <cmis:creatable>true</cmis:creatable>
        <cmis:fileable>true</cmis:fileable>
        <cmis:queryable>false</cmis:queryable>
        <cmis:fulltextIndexed>false</cmis:fulltextIndexed>
        <cmis:includedInSupertypeQuery>true</cmis:includedInSupertypeQuery>
        <cmis:controllablePolicy>true</cmis:controllablePolicy>
        <cmis:controllableACL>true</cmis:controllableACL>
        <cmis:versionable>true</cmis:versionable>
        <cmis:contentStreamAllowed>allowed</cmis:contentStreamAllowed>
    </cmisra:type>
</atom:entry>
```

Please also see the example documents included with the schema.

3.10.2 Document Entry

This is a CMIS Document instance.

CMIS Services:

GET: getObject, getObjectOfLatestVersion (getObject)

PUT: updateProperties

DELETE: deleteObject

Media Type: application/atom+xml;type=entry

Link Relations:

- self: Points to an URI that returns the atom entry for this document. Please see Atom for more information.
- edit: Points to an URI that accepts PUT of atom entry. Please see AtomPub for more information.
- service: Points to service document containing the CMIS repository. The service document MUST contain only one workspace element.
  - Media Type: application/atomsvc+xml
- up: Points to the atom feed containing the set of parents. If there is only one parent, the repository MAY point this link relation directly to the atom entry of the parent.
- version-history: Points to atom feed containing the versions of this document
  - If the document is not versionable, this link relation may not be on the resource
- current-version: Points to the latest version of the document
  - Uses query parameter ~~‘~~'returnVersion~~’~~' and enumReturnVersion
  - If this version is the current-version, this link relation may not be on the resource
- edit-media:
  - Same as setContentStream. Allows updating the content stream on this document
  - Please see AtomPub for more information
- working-copy: Points to the private working copy if it exists.
- describedby: Points to the type definition as an atom entry for the type of this document entry.

- alternate: this is used to identify the renditions available for the specified object. Please see the Renditions section.
- *http://docs.oasis-open.org/ns/cmis/link/200908/allowableactions*: Points to the allowable actions document for this object.
- *http://docs.oasis-open.org/ns/cmis/link/200908/relationships*: Points to the relationships feed for this object
- *http://docs.oasis-open.org/ns/cmis/link/200908/policies*: Points to the policy feed for this object.
- *http://docs.oasis-open.org/ns/cmis/link/200908/acl*: Points to ACL document for this object

The following CMIS Atom extension element MUST be included inside the atom entry:

- cmisra:object

3.10.2.1 GET

The following arguments may be supplied. Please see the domain model for more information:

- returnVersion
    - Used to differentiate between getObject() and getObjectOfLatestVersion().
    - valid values are are described by the schema element cmisra:enumReturnVersion
    - If not specified, return the version specified by the URI
- includeAllowableActions
- includeRelationships
- includePolicyIds
- includeACL
- filter
- renditionFilter
    - If not specified, renditions will not be included.

Request:

```
GET /obj/7c088887-5991-4b3a-9ad3-16379127e647?filter=cmis:objectId HTTP/1.1
Host: example.org

```

Response:

```
HTTP/1.1 200 Ok
Date: Mon, 25 Jan 2010 10:21:00 -0800
Content-Length: 3403
Content-Type: application/atom+xml;type=entry
Location: /obj/7c088887-5991-4b3a-9ad3-16379127e647?filter=cmis:objectId


<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<atom:entry xmlns:app=""http://www.w3.org/2007/app""
xmlns:atom=""http://www.w3.org/2005/Atom"" xmlns:cmis=""http://docs.oasis-
open.org/ns/cmis/core/200908/"" xmlns:cmism=""http://docs.oasis-
open.org/ns/cmis/messaging/200908/"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:author>
        <atom:name>Al Brown</atom:name>
        <atom:uri>http://www.ibm.com/</atom:uri>
        <atom:email>albertcbrown@us.ibm.com</atom:email>
    </atom:author>
    <atom:content src=""http://cmisexample.oasis-open.org/rep1/7c088887-5991-
4b3a-9ad3-16379127e647""/>
    <atom:id>urn:uuid:7c088887-5991-4b3a-9ad3-16379127e647</atom:id>
    <atom:title type=""text"">Invoice</atom:title>
    <atom:updated>2010-01-25T10:21:00.193-08:00</atom:updated>
    <atom:link rel=""self"" href=""http://cmisexample.oasis-
open.org/rep1/7c088887-5991-4b3a-9ad3-16379127e647""/>
    <atom:link rel=""edit"" href=""http://cmisexample.oasis-
open.org/rep1/7c088887-5991-4b3a-9ad3-16379127e647""/>
    <atom:link type=""application/cmis+xml;type=allowableActions""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/allowableactions""
href=""http://cmisexample.oasis-open.org/rep1/7c088887-5991-4b3a-9ad3-
16379127e647/allowableactions""/>
    <atom:link type=""application/atom+xml;type=entry"" rel=""describedby""
href=""http://cmisexample.oasis-open.org/rep1/7c088887-5991-4b3a-9ad3-
16379127e647/type""/>
    <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
    <atom:published>2010-01-25T10:21:00.193-08:00</atom:published>
    <atom:summary type=""html"">HTML summary of Entry  7c088887-5991-4b3a-
9ad3-16379127e647</atom:summary>
    <atom:link rel=""edit-media"" href=""http://cmisexample.oasis-
open.org/rep1/7c088887-5991-4b3a-9ad3-16379127e647/edit-media""/>
    <atom:link rel=""alternate"" href=""http://cmisexample.oasis-
open.org/rep1/7c088887-5991-4b3a-9ad3-16379127e647/alternate""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""up""
href=""http://cmisexample.oasis-open.org/rep1/7c088887-5991-4b3a-9ad3-
16379127e647/parents""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""version-history""
href=""http://cmisexample.oasis-open.org/rep1/7c088887-5991-4b3a-9ad3-
16379127e647/allversions""/>
    <atom:link type=""application/atom+xml;type=entry"" rel=""current-
version"" href=""http://cmisexample.oasis-open.org/rep1/7c088887-5991-4b3a-
9ad3-16379127e647/latest""/>
    <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/relationships""
href=""http://cmisexample.oasis-open.org/rep1/7c088887-5991-4b3a-9ad3-
16379127e647/relationships""/>
    <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/policies""
href=""http://cmisexample.oasis-open.org/rep1/7c088887-5991-4b3a-9ad3-
16379127e647/policies""/>
    <atom:link type=""application/cmisacl+xml"" rel=""http://docs.oasis-
open.org/ns/cmis/link/200908/acl"" href=""http://cmisexample.oasis-
open.org/rep1/7c088887-5991-4b3a-9ad3-16379127e647/acl""/>
    <cmisra:object>
        <cmis:properties>
            <cmis:propertyId localName=""rep-cmis:objectId""
propertyDefinitionId=""cmis:objectId"">
                <cmis:value>7c088887-5991-4b3a-9ad3-16379127e647</cmis:value>
            </cmis:propertyId>
        </cmis:properties>
    </cmisra:object>
</atom:entry>
```

Please also see the example documents included with the schema.

3.10.2.2 PUT

This does a replacement of the atom entry with the atom entry document specified. If readwrite properties are not included, the repository SHOULD NOT modify them.

The server SHOULD respond with:

- HTTP Status Code 200
- Response Body containing the updated atom entry

3.10.2.3 DELETE

This removes the document.

Success HTTP code: 204

3.10.3 Document Private Working Copy (PWC) Entry

This is the private working copy of the document (checkedout version of document)

CMIS Services:

GET: getObject
PUT: updateProperties or checkIn
DELETE: cancelCheckOut

Media Type: application/atom+xml;type=entry

Link relations:

- self: Points to the URI to retrieve this atom entry. Please see Atom for more information
- edit: Points to the URI to update this atom entry via POST. Please see AtomPub for more information.
- service: Points to service document containing the CMIS repository. The service document MUST contain only one workspace element.
    - Media Type: application/atomsvc+xml
- up: Points to the atom feed containing the set of parents. If there is only one parent, the repository MAY point this link relation directly to the atom entry of the parent.
- version-history
    - Points to an URI that returns the feed associated with the version history
- edit-media
    - Same as setContentStream. Allows updating the content stream on this document
    - Please see AtomPub for more information
- via: atom entry that created this private working copy
- describedby: Points to the type definition as an atom entry for the type of this PWC entry.
- alternate: this is used to identify the renditions available for the specified object. Please see the Renditions section.
- *http://docs.oasis-open.org/ns/cmis/link/200908/allowableactions*: Points to the allowable actions document for this object.
- *http://docs.oasis-open.org/ns/cmis/link/200908/relationships*: Points to the relationships feed for this object
- *http://docs.oasis-open.org/ns/cmis/link/200908/policies*: Points to the policy feed for this object.

- *http://docs.oasis-open.org/ns/cmis/link/200908/acl*: Points to ACL document for this object

The following element MUST be included inside the atom entry:

- cmisra:object

3.10.3.1 GET

The following arguments may be supplied. Please see the domain model for more information:

- filter
- includeAllowableActions
- includeRelationships
- renditionFilter
  - If not specified, renditions will not be included.

Request:

```
GET /obj/3240a476-6de6-4ab2-978d-85ca2f4f3206?filter=cmis:objectId HTTP/1.1
Host: example.org

```

Response:

```
HTTP/1.1 200 Ok
Date: Mon, 25 Jan 2010 10:21:00 -0800
Content-Length: 3564
Content-Type: application/atom+xml;type=entry
Location: /obj/3240a476-6de6-4ab2-978d-85ca2f4f3206?filter=cmis:objectId


<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<atom:entry xmlns:app=""http://www.w3.org/2007/app""
xmlns:atom=""http://www.w3.org/2005/Atom"" xmlns:cmis=""http://docs.oasis-
open.org/ns/cmis/core/200908/"" xmlns:cmism=""http://docs.oasis-
open.org/ns/cmis/messaging/200908/"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:author>
        <atom:name>Al Brown</atom:name>
        <atom:uri>http://www.ibm.com/</atom:uri>
        <atom:email>albertcbrown@us.ibm.com</atom:email>
    </atom:author>
    <atom:content src=""http://cmisexample.oasis-open.org/rep1/3240a476-6de6-
4ab2-978d-85ca2f4f3206""/>
    <atom:id>urn:uuid:3240a476-6de6-4ab2-978d-85ca2f4f3206</atom:id>
    <atom:title type=""text"">Invoice</atom:title>
    <atom:updated>2010-01-25T10:21:00.333-08:00</atom:updated>
    <atom:link rel=""self"" href=""http://cmisexample.oasis-
open.org/rep1/3240a476-6de6-4ab2-978d-85ca2f4f3206""/>
    <atom:link rel=""edit"" href=""http://cmisexample.oasis-
open.org/rep1/3240a476-6de6-4ab2-978d-85ca2f4f3206""/>
    <atom:link type=""application/cmis+xml;type=allowableActions""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/allowableactions""
href=""http://cmisexample.oasis-open.org/rep1/3240a476-6de6-4ab2-978d-
85ca2f4f3206/allowableactions""/>
    <atom:link type=""application/atom+xml;type=entry"" rel=""describedby""
href=""http://cmisexample.oasis-open.org/rep1/3240a476-6de6-4ab2-978d-
85ca2f4f3206/type""/>
```

```
    <atom:link type=""application/atomsvc+xml"" rel=""service"" 
href=""http://cmisexample.oasis-open.org/rep1//service""/>
    <atom:published>2010-01-25T10:21:00.333-08:00</atom:published>
    <atom:summary type=""html"">HTML summary of Entry  3240a476-6de6-4ab2-
978d-85ca2f4f3206</atom:summary>
    <atom:link rel=""edit-media"" href=""http://cmisexample.oasis-
open.org/rep1/3240a476-6de6-4ab2-978d-85ca2f4f3206/edit-media""/>
    <atom:link rel=""alternate"" href=""http://cmisexample.oasis-
open.org/rep1/3240a476-6de6-4ab2-978d-85ca2f4f3206/alternate""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""up"" 
href=""http://cmisexample.oasis-open.org/rep1/3240a476-6de6-4ab2-978d-
85ca2f4f3206/parents""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""version-history"" 
href=""http://cmisexample.oasis-open.org/rep1/3240a476-6de6-4ab2-978d-
85ca2f4f3206/allversions""/>
    <atom:link type=""application/atom+xml;type=entry"" rel=""current-
version"" href=""http://cmisexample.oasis-open.org/rep1/3240a476-6de6-4ab2-
978d-85ca2f4f3206/latest""/>
    <atom:link type=""application/atom+xml;type=feed"" 
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/relationships"" 
href=""http://cmisexample.oasis-open.org/rep1/3240a476-6de6-4ab2-978d-
85ca2f4f3206/relationships""/>
    <atom:link type=""application/atom+xml;type=feed"" 
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/policies"" 
href=""http://cmisexample.oasis-open.org/rep1/3240a476-6de6-4ab2-978d-
85ca2f4f3206/policies""/>
    <atom:link type=""application/cmisacl+xml"" rel=""http://docs.oasis-
open.org/ns/cmis/link/200908/acl"" href=""http://cmisexample.oasis-
open.org/rep1/3240a476-6de6-4ab2-978d-85ca2f4f3206/acl""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""working-copy"" 
href=""http://cmisexample.oasis-open.org/rep1/3240a476-6de6-4ab2-978d-
85ca2f4f3206/pwc""/>
    <cmisra:object>
        <cmis:properties>
            <cmis:propertyId localName=""rep-cmis:objectId"" 
propertyDefinitionId=""cmis:objectId"">
                <cmis:value>3240a476-6de6-4ab2-978d-85ca2f4f3206</cmis:value>
            </cmis:propertyId>
        </cmis:properties>
    </cmisra:object>
</atom:entry>
```

Please also see the example documents included with the schema.

3.10.3.2 PUT

This does a replacement of the atom entry with the atom entry document specified. If modifiable properties (whencheckedout or readwrite) are not included, the repository SHOULD NOT modify them.

The following arguments may be supplied. Please see the domain model for more information:

- checkinComment
- major
- checkin
  - Used to differentiate between updateProperties() or checkin() services. If TRUE, execute checkin service.

- If this argument is specified as TRUE, then the body to PUT MAY be omitted if there are no modifications to be made during checkin

The server SHOULD respond with:

- HTTP Status Code 200
- Location header of the resource (if changed via checkin)
- Response Body containing the updated atom entry

3.10.3.3 DELETE

This removes the document entry, in this case, cancels the check out. The PWC will be removed.

Success HTTP code: 204

3.10.4 Folder Entry

This is a CMIS Folder instance. The properties of a folder map onto the feed tag.

CMIS Services:

GET: getObject

PUT: updateProperties

DELETE: deleteObject (this is deletion of the folder only and not any contained objects)

Media Type: application/atom+xml;type=entry

Link Relations:

- self: Points to the URI to retrieve this atom entry. Please see Atom for more informationedit: Points to the URI to update this atom entry via POST. Please see AtomPub for more information.
- service: Points to service document containing the CMIS repository. The service document MUST contain only one workspace element.
  - Media Type: application/atomsvc+xml
- describedby: Points to the type definition as an atom entry for the type of this folder entry.
- down: Points to the children of this folder
  - application/atom+xml : Points to the atom feed document representing the children feed for this same folder
  - application/cmistree+xml: Points to the descendants feed of the same folder
- up: Points to the atom entry for the parent
  - If the root folder, this link will not be present
- alternate: this is used to identify the renditions available for the specified object. Please see the Renditions section.
- *http://docs.oasis-open.org/ns/cmis/link/200908/allowableactions*: Points to the allowable actions document for this object.
- *http://docs.oasis-open.org/ns/cmis/link/200908/relationships*: Points to the relationships feed for this object
- *http://docs.oasis-open.org/ns/cmis/link/200908/policies*: Points to the policy feed for this object.
- *http://docs.oasis-open.org/ns/cmis/link/200908/acl*: Points to ACL document for this object
- *http://docs.oasis-open.org/ns/cmis/link/200908/foldertree*: Points to the folder tree for this folder

The following CMIS Atom extension element MUST be included inside the atom entry:

- cmisra:object

3.10.4.1 GET

The following arguments may be supplied. Please see the domain model for more information:

- filter
- includeAllowableActions
- includeRelationships
- renditionFilter
    - If not specified, renditions will not be included.

Request:

```
GET /obj/cfc03a28-8240-471d-b4ba-6d8756cd5093?filter=cmis:objectId HTTP/1.1
Host: example.org

```

Response:

```
HTTP/1.1 200 Ok
Date: Mon, 25 Jan 2010 10:21:00 -0800
Content-Length: 3332
Content-Type: application/atom+xml;type=entry
Location: /obj/cfc03a28-8240-471d-b4ba-6d8756cd5093?filter=cmis:objectId


<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<atom:entry xmlns:app=""http://www.w3.org/2007/app""
xmlns:atom=""http://www.w3.org/2005/Atom"" xmlns:cmis=""http://docs.oasis-
open.org/ns/cmis/core/200908/"" xmlns:cmism=""http://docs.oasis-
open.org/ns/cmis/messaging/200908/"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:author>
        <atom:name>Al Brown</atom:name>
        <atom:uri>http://www.ibm.com/</atom:uri>
        <atom:email>albertcbrown@us.ibm.com</atom:email>
    </atom:author>
    <atom:content src=""http://cmisexample.oasis-open.org/rep1/cfc03a28-8240-
471d-b4ba-6d8756cd5093""/>
    <atom:id>urn:uuid:cfc03a28-8240-471d-b4ba-6d8756cd5093</atom:id>
    <atom:title type=""text"">Customer Folder</atom:title>
    <atom:updated>2010-01-25T10:21:00.208-08:00</atom:updated>
    <atom:link rel=""self"" href=""http://cmisexample.oasis-
open.org/rep1/cfc03a28-8240-471d-b4ba-6d8756cd5093""/>
    <atom:link rel=""edit"" href=""http://cmisexample.oasis-
open.org/rep1/cfc03a28-8240-471d-b4ba-6d8756cd5093""/>
    <atom:link type=""application/cmis+xml;type=allowableActions""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/allowableactions""
href=""http://cmisexample.oasis-open.org/rep1/cfc03a28-8240-471d-b4ba-
6d8756cd5093/allowableactions""/>
    <atom:link type=""application/atom+xml;type=entry"" rel=""describedby""
href=""http://cmisexample.oasis-open.org/rep1/cfc03a28-8240-471d-b4ba-
6d8756cd5093/type""/>
    <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
    <atom:published>2010-01-25T10:21:00.208-08:00</atom:published>
    <atom:summary type=""html"">HTML summary of Entry  cfc03a28-8240-471d-
b4ba-6d8756cd5093</atom:summary>
    <atom:link type=""application/atom+xml;type=entry"" rel=""up""
href=""http://cmisexample.oasis-open.org/rep1/cfc03a28-8240-471d-b4ba-
6d8756cd5093/up""/>
    <atom:link type=""application/atom+xml;type=feed"" rel=""down""
href=""http://cmisexample.oasis-open.org/rep1/cfc03a28-8240-471d-b4ba-
6d8756cd5093/children""/>
    <atom:link type=""application/cmistree+xml"" rel=""down""
href=""http://cmisexample.oasis-open.org/rep1/cfc03a28-8240-471d-b4ba-
6d8756cd5093/tree""/>
    <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/foldertree""
href=""http://cmisexample.oasis-open.org/rep1/cfc03a28-8240-471d-b4ba-
6d8756cd5093/foldertree""/>
    <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/relationships""
href=""http://cmisexample.oasis-open.org/rep1/cfc03a28-8240-471d-b4ba-
6d8756cd5093/relationships""/>
    <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/policies""
href=""http://cmisexample.oasis-open.org/rep1/cfc03a28-8240-471d-b4ba-
6d8756cd5093/policies""/>
    <atom:link type=""application/cmisacl+xml"" rel=""http://docs.oasis-
open.org/ns/cmis/link/200908/acl"" href=""http://cmisexample.oasis-
open.org/rep1/cfc03a28-8240-471d-b4ba-6d8756cd5093/acl""/>
    <cmisra:object>
        <cmis:properties>
            <cmis:propertyId localName=""rep-cmis:objectId""
propertyDefinitionId=""cmis:objectId"">
                <cmis:value>cfc03a28-8240-471d-b4ba-6d8756cd5093</cmis:value>
            </cmis:propertyId>
        </cmis:properties>
    </cmisra:object>
</atom:entry>
```

Please also see the example documents included with the schema.

3.10.4.2 PUT

This does a replacement of the atom entry with the atom entry document specified. If readwrite properties are not included, the repository SHOULD NOT modify them.

The server SHOULD respond with:

- HTTP Status Code 200
- Response Body containing the updated atom entry

3.10.4.3 DELETE

This removes the object (folder) from the repository.

Success HTTP code: 204

3.10.5 Relationship Entry

This is a CMIS relationship instance. These objects are exposed via “"relationships”" link type.

CMIS Services:

GET: getObject

PUT: updateProperties

DELETE: deleteObject

Media Type: application/atom+xml;type=entry

Link Relations:

- self: Points to the URI to retrieve this atom entry. Please see Atom for more information
- edit: Points to the URI to update this atom entry via POST. Please see AtomPub for more information.
- service: Points to service document containing the CMIS repository. The service document MUST contain only one workspace element.
    - Media Type: application/atomsvc+xml
- describedby: Points to the type definition as an atom entry for the type of this relationship entry.
- http://docs.oasis-open.org/ns/cmis/link/200908/target
- http://docs.oasis-open.org/ns/cmis/link/200908/source
- *http://docs.oasis-open.org/ns/cmis/link/200908/allowableactions*: Points to the allowable actions document for this object.
- *http://docs.oasis-open.org/ns/cmis/link/200908/policies*: Points to the policy feed for this object.
- *http://docs.oasis-open.org/ns/cmis/link/200908/acl*: Points to ACL document for this object

The following element MUST be included inside the atom entry:

- cmisra:object

3.10.5.1 GET

The following arguments may be supplied. Please see the domain model for more information:

- filter
- includeAllowableActions

Request:

```
GET /obj/ad443afd-aa1a-4071-9735-1a49aac4e439?filter=cmis:objectId HTTP/1.1
Host: example.org

```

Response:

```
HTTP/1.1 200 Ok
Date: Mon, 25 Jan 2010 10:21:00 -0800
Content-Length: 2861
Content-Type: application/atom+xml;type=entry
Location: /obj/ad443afd-aa1a-4071-9735-1a49aac4e439?filter=cmis:objectId


<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
```

```
<atom:entry xmlns:app=""http://www.w3.org/2007/app""
xmlns:atom=""http://www.w3.org/2005/Atom"" xmlns:cmis=""http://docs.oasis-
open.org/ns/cmis/core/200908/"" xmlns:cmism=""http://docs.oasis-
open.org/ns/cmis/messaging/200908/"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:author>
        <atom:name>Al Brown</atom:name>
        <atom:uri>http://www.ibm.com/</atom:uri>
        <atom:email>albertcbrown@us.ibm.com</atom:email>
    </atom:author>
    <atom:content src=""http://cmisexample.oasis-open.org/rep1/ad443afd-aa1a-
4071-9735-1a49aac4e439""/>
    <atom:id>urn:uuid:ad443afd-aa1a-4071-9735-1a49aac4e439</atom:id>
    <atom:title type=""text"">Customer Relationship</atom:title>
    <atom:updated>2010-01-25T10:21:00.349-08:00</atom:updated>
    <atom:link rel=""self"" href=""http://cmisexample.oasis-
open.org/rep1/ad443afd-aa1a-4071-9735-1a49aac4e439""/>
    <atom:link rel=""edit"" href=""http://cmisexample.oasis-
open.org/rep1/ad443afd-aa1a-4071-9735-1a49aac4e439""/>
    <atom:link type=""application/cmis+xml;type=allowableActions""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/allowableactions""
href=""http://cmisexample.oasis-open.org/rep1/ad443afd-aa1a-4071-9735-
1a49aac4e439/allowableactions""/>
    <atom:link type=""application/atom+xml;type=entry"" rel=""describedby""
href=""http://cmisexample.oasis-open.org/rep1/ad443afd-aa1a-4071-9735-
1a49aac4e439/type""/>
    <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
    <atom:published>2010-01-25T10:21:00.365-08:00</atom:published>
    <atom:summary type=""html"">HTML summary of Entry  ad443afd-aa1a-4071-
9735-1a49aac4e439</atom:summary>
    <atom:link type=""application/atom+xml;type=entry""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/source""
href=""http://cmisexample.oasis-open.org/rep1/ad443afd-aa1a-4071-9735-
1a49aac4e439/source""/>
    <atom:link type=""application/atom+xml;type=entry""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/target""
href=""http://cmisexample.oasis-open.org/rep1/ad443afd-aa1a-4071-9735-
1a49aac4e439/target""/>
    <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/policies""
href=""http://cmisexample.oasis-open.org/rep1/ad443afd-aa1a-4071-9735-
1a49aac4e439/policies""/>
    <atom:link type=""application/cmisacl+xml"" rel=""http://docs.oasis-
open.org/ns/cmis/link/200908/acl"" href=""http://cmisexample.oasis-
open.org/rep1/ad443afd-aa1a-4071-9735-1a49aac4e439/acl""/>
    <cmisra:object>
        <cmis:properties>
            <cmis:propertyId localName=""rep-cmis:objectId""
propertyDefinitionId=""cmis:objectId"">
                <cmis:value>ad443afd-aa1a-4071-9735-1a49aac4e439</cmis:value>
            </cmis:propertyId>
        </cmis:properties>
    </cmisra:object>
</atom:entry>
```

Please also see the example documents included with the schema.

3.10.5.2 PUT

This does a replacement of the atom entry with the atom entry document specified. If readwrite properties are not included, the repository SHOULD NOT modify them.

The server SHOULD respond with:

- HTTP Status Code 200
- Response Body containing the updated atom entry

3.10.5.3 DELETE

This removes the relationship entry.

Successful HTTP code: 204

3.10.6 Policy Entry

This is a CMIS policy instance.

CMIS Services:

GET: getObject

PUT: updateProperties

DELETE: deleteObject or removePolicy

Media Type: application/atom+xml;type=entry

Link Relations:

- self
- edit
- service: Points to service document containing the CMIS repository. The service document MUST contain only one workspace element.
  - Media Type: application/atomsvc+xml
- describedby: Points to the type definition as an atom entry for the type of this policy entry.
- alternate: this is used to identify the renditions available for the specified object. Please see the Renditions section.
- *http://docs.oasis-open.org/ns/cmis/link/200908/allowableactions*: Points to the allowable actions document for this object.
- *http://docs.oasis-open.org/ns/cmis/link/200908/policies*: Points to the policy feed for this object.
- *http://docs.oasis-open.org/ns/cmis/link/200908/acl*: Points to ACL document for this object

The following element MUST be included inside the atom entry:

- cmisra:object

3.10.6.1 GET

The following arguments may be supplied. Please see the domain model for more information:

- filter
- includeAllowableActions

- includeRelationships
- renditionFilter
    - If not specified, renditions will not be included.

Request:

```
GET /obj/a09ed524-5f1b-4940-b2f0-4e4cd4631bf0?filter=cmis:objectId HTTP/1.1
Host: example.org

```

Response:

```
HTTP/1.1 200 Ok
Date: Mon, 25 Jan 2010 10:21:00 -0800
Content-Length: 2608
Content-Type: application/atom+xml;type=entry
Location: /obj/a09ed524-5f1b-4940-b2f0-4e4cd4631bf0?filter=cmis:objectId


<?xml version=""1.0"" encoding=""UTF-8"" standalone=""yes""?>
<atom:entry xmlns:app=""http://www.w3.org/2007/app""
xmlns:atom=""http://www.w3.org/2005/Atom"" xmlns:cmis=""http://docs.oasis-
open.org/ns/cmis/core/200908/"" xmlns:cmism=""http://docs.oasis-
open.org/ns/cmis/messaging/200908/"" xmlns:cmisra=""http://docs.oasis-
open.org/ns/cmis/restatom/200908/"">
    <atom:author>
        <atom:name>Al Brown</atom:name>
        <atom:uri>http://www.ibm.com/</atom:uri>
        <atom:email>albertcbrown@us.ibm.com</atom:email>
    </atom:author>
    <atom:content src=""http://cmisexample.oasis-open.org/rep1/a09ed524-5f1b-
4940-b2f0-4e4cd4631bf0""/>
    <atom:id>urn:uuid:a09ed524-5f1b-4940-b2f0-4e4cd4631bf0</atom:id>
    <atom:title type=""text"">Security Policy</atom:title>
    <atom:updated>2010-01-25T10:21:00.318-08:00</atom:updated>
    <atom:link rel=""self"" href=""http://cmisexample.oasis-
open.org/rep1/a09ed524-5f1b-4940-b2f0-4e4cd4631bf0""/>
    <atom:link rel=""edit"" href=""http://cmisexample.oasis-
open.org/rep1/a09ed524-5f1b-4940-b2f0-4e4cd4631bf0""/>
    <atom:link type=""application/cmis+xml;type=allowableActions""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/allowableactions""
href=""http://cmisexample.oasis-open.org/rep1/a09ed524-5f1b-4940-b2f0-
4e4cd4631bf0/allowableactions""/>
    <atom:link type=""application/atom+xml;type=entry"" rel=""describedby""
href=""http://cmisexample.oasis-open.org/rep1/a09ed524-5f1b-4940-b2f0-
4e4cd4631bf0/type""/>
    <atom:link type=""application/atomsvc+xml"" rel=""service""
href=""http://cmisexample.oasis-open.org/rep1//service""/>
    <atom:published>2010-01-25T10:21:00.318-08:00</atom:published>
    <atom:summary type=""html"">HTML summary of Entry  a09ed524-5f1b-4940-
b2f0-4e4cd4631bf0</atom:summary>
    <atom:link type=""application/atom+xml;type=feed"" rel=""up""
href=""http://cmisexample.oasis-open.org/rep1/a09ed524-5f1b-4940-b2f0-
4e4cd4631bf0/parents""/>
    <atom:link type=""application/atom+xml;type=feed""
rel=""http://docs.oasis-open.org/ns/cmis/link/200908/relationships""
href=""http://cmisexample.oasis-open.org/rep1/a09ed524-5f1b-4940-b2f0-
4e4cd4631bf0/relationships""/>
    <atom:link type=""application/cmisacl+xml"" rel=""http://docs.oasis-
open.org/ns/cmis/link/200908/acl"" href=""http://cmisexample.oasis-
open.org/rep1/a09ed524-5f1b-4940-b2f0-4e4cd4631bf0/acl""/>
    <cmisra:object>
```

```
        <cmis:properties>
            <cmis:propertyId localName=""rep-cmis:objectId""
propertyDefinitionId=""cmis:objectId"">
                <cmis:value>a09ed524-5f1b-4940-b2f0-4e4cd4631bf0</cmis:value>
            </cmis:propertyId>
        </cmis:properties>
    </cmisra:object>
</atom:entry>
```

Please also see the example documents included with the schema.

3.10.6.2 PUT

This does a replacement of the atom entry with the atom entry document specified. If read/write properties are not included, the repository SHOULD NOT modify them.

The server SHOULD respond with:

- HTTP Status Code 200
- Response Body containing the updated atom entry

3.10.6.3 DELETE

This removes the policy entry. If this policy entry was discovered through a policy collection on an object, then removePolicy() is performed rather than deleteObject() on the policy itself.

Success HTTP code: 204

3.10.7 Content Stream

This is the content stream portion of the document object.

CMIS Services:

GET: getContentStream

PUT: setContentStream

DELETE: deleteContentStream

Media Type: Mime/Type of resource (mime type of content stream on document)

3.10.7.1 GET

This returns the content stream.

It is RECOMMENDED that HTTP Range requests are supported on this resource. It is RECOMMENDED that HTTP compression is also supported.

Please see RFC2616 for more information on HTTP Range requests.

3.10.7.2 PUT

This does a replacement of the content stream.

The following optional arguments may be supplied. Please see the domain model for more information:

- overwriteFlag.
    - If not specified, this defaults to ~~“~~"true~~”~~" in this binding and behaves consistent with AtomPub.

Success HTTP code: 200 (with content), 204 (without content) or 201 if a new resource is created. Please see the HTTP specification for more information.

Returns headers:

- Content-Location: URI for content stream
- Location: URI for content stream

3.10.7.3 DELETE

This removes the content stream.

3.10.8 ACL Resource

CMIS Services:

GET: getACL

PUT: applyACL

Media Type: application/cmisacl+xml

3.10.8.1 GET

This returns the CMIS ACL for a specified object. The client will follow the link on the atom entry to get the CMIS ACL for that object.

Request:

```
GET /objacl/fd79b7bd-2579-4ad1-aea2-eda89527fbef HTTP/1.1
Host: example.org

```

Response:

```
HTTP/1.1 200 Ok
Date: Mon, 25 Jan 2010 10:21:00 -0800
Content-Length: 758
Content-Type: application/cmisacl+xml
Location: /objacl/fd79b7bd-2579-4ad1-aea2-eda89527fbef


<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<cmis:acl xmlns:app="http://www.w3.org/2007/app"
xmlns:atom="http://www.w3.org/2005/Atom" xmlns:cmis="http://docs.oasis-
open.org/ns/cmis/core/200908/" xmlns:cmism="http://docs.oasis-
open.org/ns/cmis/messaging/200908/" xmlns:cmisra="http://docs.oasis-
open.org/ns/cmis/restatom/200908/">
    <cmis:permission>
        <cmis:principal>
            <cmis:principalId>Al Brown</cmis:principalId>
        </cmis:principal>
        <cmis:permission>cmis:read</cmis:permission>
        <cmis:permission>cmis:write</cmis:permission>
        <cmis:permission>cmis:all</cmis:permission>
        <cmis:permission>publish</cmis:permission>
        <cmis:direct>true</cmis:direct>
    </cmis:permission>
</cmis:acl>

```

Please also see the example documents included with the schema.

4 Web Services Binding

4.1 Overview

All services and operations defined in the Domain Model are presented in the Web Services binding.

The WSDL for these services reference two XSD documents. One defines elements for the primary data types of documents, folders, relationships and policies as well as collections of these types of objects. The second XSD defines the message formats for each of the CMIS services; the messages often refer to the data types defined in the first XSD schema. The WSDL presents exactly the abstract services defined in the Services section.

The normative CMIS Web Services binding is defined by the WSDL and XSD as well as the details given here in this part of the CMIS specification except the examples.

4.1.1 WS-I

A CMIS Web Services binding MUST comply with WS-I Basic Profile 1.1 and Basic Security Profile 1.0.

4.1.2 Authentication

A CMIS Web Services binding SHOULD support WS-Security 1.1 for Username Token Profile 1.1 and MAY also support other authentication mechanisms. A CMIS repository MAY grant access to all or a subset of the CMIS services to unauthenticated clients.

4.1.3 Content Transfer

All endpoints of the Web Services binding MUST be MTOM enabled.

4.1.4 Reporting Errors

Services MUST report errors via SOAP faults. The CMIS-Messaging.xsd defines a basic fault structure that includes an error code and an error message and the WSDL for each service defines specific messages that have the basic fault format.

4.2 Web Services Binding Mapping

The Domain Model defines all services, operations, parameters and objects of CMIS. The Web Services binding is an exact one-to-one mapping of this definition with small exceptions that are explained in the next section. Operations and parameters are named exactly after their counterparts in the Services section. All rules and exceptions defined there apply to the Web Services binding. Optional parameters and optional return values are not set if they are missing or their value is NULL.

4.3 Additions to the Services section

4.3.1 updateProperties and checkIn Semantics

This binding supports partial properties updates. All properties passed to updateProperties or checkIn will be updated to their new values. Properties that are passed without a value will be set to their default value or un-set if no default value is defined. All others property values remain untouched.

4.3.2 Content Ranges

This binding supports the retrieval of content ranges. The operation getContentStream accepts two optional parameters:

- **Integer offset:** The first byte of the content to retrieve. Default value is 0.
- **Integer length:** The length of the range in bytes. Default value is the size of the content minus the offset.

If the **offset** value is greater than the size of the content the repository SHOULD throw a `constraint` exception.

If **offset** + **length** is greater than the size of the content the repository should deliver the content from the offset to the end of the content.

4.3.3 Extensions

On all input messages and some output messages exists an element called extension. This element is used to provide vendor or repository-specific information between client and server.

All of the types referenced by the schema also support xs:any for vendor or repository-specific information.

4.3.4 Web Services Specific Structures

This binding requires specific structures that are not part of the general CMIS schema.

Please also see the example request and response documents included with the schema.

4.3.4.1 cmisFaultType and cmisFault

`cmisFaultType` and `cmisFault` SHOULD be used to generate SOAP faults. See 0

Reporting Errors

~~Reporting Errors~~.

4.3.4.2 cmisRepositoryEntryType

`cmisRepositoryEntryType` is the return structure of getRepositories. It contains the id and the name of a repository.

4.3.4.3 cmisTypeContainer

`cmisTypeContainer` is the return structure of getTypeDescendants. It holds a type hierarchy.

4.3.4.4 cmisTypeDefinitionListType

`cmisTypeDefinitionListType` is the return structure of getTypeChildren. It contains a list of types, the `hasMoreItems` flag and the `numItem` element.

4.3.4.5 cmisObjectInFolderType, cmisObjectParentsType and cmisObjectInFolderContainerType

`cmisObjectInFolderType` holds, in addition to a `cmisObjectType` object, a path segment string. It is used in all operations that support the `includePathSegments` parameter.
`cmisObjectParentsType` is similar but has a relative path segment string instead of a path segment. For details about path segments and relative path segments see section 2.1.5.3 Paths.

`cmisObjectInFolderContainerType` contains a folder hierarchy.

4.3.4.6 cmisObjectListType and cmisObjectInFolderListType

cmisObjectListType and cmisObjectInFolderListType hold lists of cmisObjectType and cmisObjectInFolderType structures. They also contain the hasMoreItems flag and the numItems element that are returned by operations that return these lists.

4.3.4.7 cmisContentStreamType

cmisContentStreamType wraps a content stream and additional information about the stream.

		Client to Repository	Repository to Client
length	Length of the content stream in bytes. If set it MUST be a positive number. If the length is unknown it MUST NOT be set.	SHOULD be set	SHOULD be set
mimeType	MIME Media Type of the content stream. For the primary content of a document it SHOULD match the value of the property cmis:contentStreamMimeType.	SHOULD be set	MUST be set
filename	Filename of the content stream. For the primary content of a document it SHOULD match the value of the property cmis:contentStreamFileName.	SHOULD be set	SHOULD be set
stream	The content stream. MUST be present even if the content stream has 0 bytes.	MUST be set	MUST be set

4.3.4.8 cmisACLType

cmisACLType is the return structure of getACL and applyACL. It contains the current Access Control List (ACL) of the object and the exact flag that indeciates if the ACL fully describes the permission of this object.

4.3.4.9 cmisExtensionType

cmisExtensionType is a placeholder for extensions. See 4.3.3 Extensions.

5 IANA Considerations

5.1 Content-Type Registration

5.1.1 CMIS Query

A CMIS Query Document, when serialized as XML 1.0, can be identified with the following media type:

MIME media type name: application

MIME subtype name: cmisquery +xml

Mandatory parameters: None

Optional parameters:

~~"~~"charset~~"~~": This parameter has semantics identical to the charset parameter of the ~~"~~"application/xml~~"~~" media type as specified in [RFC3023].

Encoding considerations:

Identical to those of ~~"~~"application/xml~~"~~" as described in [RFC3023], Section 3.2.

Security considerations: As defined in this specification.

In addition, as this media type uses the ~~"~~"+xml~~"~~" convention, it shares the same security considerations as described in [RFC3023], Section 10.

Interoperability considerations:

There are no known interoperability issues.

Published specification: This specification.

Applications that use this media type:

No known applications currently use this media type.

Additional information:

Magic number(s):

As specified for ~~"~~"application/xml~~"~~" in [RFC3023], Section 3.2.

File extension: .cmisquery

Fragment identifiers:

As specified for ~~"~~"application/xml~~"~~" in [RFC3023], Section 5.

Base URI:

As specified in [RFC3023], Section 6.

Macintosh File Type code: TEXT

Person and email address to contact for further information:

OASIS CMIS TC <cmis@lists.oasis-open.org>

Intended usage: COMMON

Author/Change controller: IESG

5.1.2 CMIS AllowableActions

A CMIS Allowable Actions Document, when serialized as XML 1.0, can be identified with the following media type:

MIME media type name: application

MIME subtype name: cmisallowableactions +xml

Mandatory parameters: None.

Optional parameters:

~~"~~"charset~~"~~": This parameter has semantics identical to the charset parameter of the ~~"~~"application/xml~~"~~" media type as specified in [RFC3023].

Encoding considerations:

Identical to those of ~~"~~"application/xml~~"~~" as described in [RFC3023], Section 3.2.

Security considerations: As defined in this specification.

In addition, as this media type uses the ~~"~~"+xml~~"~~" convention, it shares the same security considerations as described in [RFC3023], Section 10.

Interoperability considerations:

There are no known interoperability issues.

Published specification: This specification.

Applications that use this media type:

No known applications currently use this media type.

Additional information:

Magic number(s):

As specified for ~~"~~"application/xml~~"~~" in [RFC3023], Section 3.2.

File extension: .cmisallowableactions

Fragment identifiers:

As specified for ~~"~~"application/xml~~"~~" in [RFC3023], Section 5.

Base URI:

As specified in [RFC3023], Section 6.

Macintosh File Type code: TEXT

Person and email address to contact for further information:

OASIS CMIS TC <cmis@lists.oasis-open.org>

Intended usage: COMMON

Author/Change controller: IESG

5.1.3 CMIS Tree

A CMIS Tree Document, when serialized as XML 1.0, can be identified with the following media type:

MIME media type name: application

MIME subtype name: cmistree +xml

Mandatory parameters: None.

Optional parameters:

~~"~~"charset~~"~~": This parameter has semantics identical to the charset parameter of the ~~"~~"application/xml~~"~~" media type as specified in [RFC3023].

Encoding considerations:

Identical to those of ~~"~~"application/xml~~"~~" as described in [RFC3023], Section 3.2.

Security considerations: As defined in this specification.

In addition, as this media type uses the ~~"~~"+xml~~"~~" convention, it shares the same security considerations as described in [RFC3023], Section 10.

Interoperability considerations:

There are no known interoperability issues.

Published specification: This specification.

Applications that use this media type:

No known applications currently use this media type.

Additional information:

Magic number(s):

As specified for ~~"~~"application/xml~~"~~" in [RFC3023], Section 3.2.

File extension: .cmistree

Fragment identifiers:

As specified for ~~"~~"application/xml~~"~~" in [RFC3023], Section 5.

Base URI:

As specified in [RFC3023], Section 6.

Macintosh File Type code: TEXT

Person and email address to contact for further information:

OASIS CMIS TC <cmis@lists.oasis-open.org>

Intended usage: COMMON

Author/Change controller: IESG

5.1.4 CMIS Atom

A CMIS Atom Document, when serialized as XML 1.0, can be identified with the following media type:

MIME media type name: application

MIME subtype name: cmisatom +xml

Mandatory parameters: None.

Optional parameters:

~~"~~"charset~~"~~": This parameter has semantics identical to the charset parameter of the ~~"~~"application/xml~~"~~" media type as specified in [RFC3023].

~~“~~"type~~”~~": This parameter has semantics identical to the type parameter of the ~~“~~"application/atom+xml~~”~~" as specified in [RFC4287]

Encoding considerations:

Identical to those of ~~"~~"application/xml~~"~~" as described in [RFC3023], Section 3.2.

Security considerations: As defined in this specification.

In addition, as this media type uses the ~~"~~"+xml~~"~~" convention, it shares the same security considerations as described in [RFC3023], Section 10.

Interoperability considerations:

There are no known interoperability issues.

Published specification: This specification.

Applications that use this media type:

No known applications currently use this media type.

Additional information:

Magic number(s):

As specified for ~~"~~"application/xml~~"~~" in [RFC3023], Section 3.2.

File extension: .cmisatom

Fragment identifiers:

As specified for ~~"~~"application/xml~~"~~" in [RFC3023], Section 5.

Base URI:

As specified in [RFC3023], Section 6.

Macintosh File Type code: TEXT

Person and email address to contact for further information:

OASIS CMIS TC <cmis@lists.oasis-open.org>

Intended usage: COMMON

Author/Change controller: IESG

Please see section 3.1.1 on why this media type is needed above the Atom Media Type.

5.1.5 CMIS ACL

A CMIS ACL Document, when serialized as XML 1.0, can be identified with the following media type:

MIME media type name: application

MIME subtype name: cmisacl +xml

Mandatory parameters: None.

Optional parameters:

~~"~~"charset~~"~~": This parameter has semantics identical to the charset parameter of the ~~"~~"application/xml~~"~~" media type as specified in [RFC3023].

Encoding considerations:

Identical to those of ~~"~~"application/xml~~"~~" as described in [RFC3023], Section 3.2.

Security considerations: As defined in this specification.

In addition, as this media type uses the ~~"~~"+xml~~"~~" convention, it shares the same security considerations as described in [RFC3023], Section 10.

Interoperability considerations:

There are no known interoperability issues.

Published specification: This specification.

Applications that use this media type:

No known applications currently use this media type.

Additional information:

Magic number(s):

As specified for ~~"~~"application/xml~~"~~" in [RFC3023], Section 3.2.

File extension: .cmisacl

Fragment identifiers:

As specified for ~~"~~"application/xml~~"~~" in [RFC3023], Section 5.

Base URI:

As specified in [RFC3023], Section 6.

Macintosh File Type code: TEXT

Person and email address to contact for further information:

OASIS CMIS TC <cmis@lists.oasis-open.org>

Intended usage: COMMON

Author/Change controller: IESG

6 Conformance

An implementation conforms to this specification if it satisfies all of the MUST or REQUIRED level requirements defined within this specification.

Specification:

This specification references a number of other specifications (see the table above). In order to comply with this specification, an implementation MUST implement the portions of referenced specifications necessary to comply with the required provisions of this specification. Additionally, the implementation of the portions of the referenced specifications that are specifically cited in this specification MUST comply with the rules for those portions as established in the referenced specification.

An implementation conforms to this specification if it satisfies all of the MUST or REQUIRED level requirements defined within this specification.

Domain Model:

Normative text within this specification takes precedence over the CMIS Core XML Schema.

That is, the normative text in this specification further constrains the schemas and/or WSDL that are part of this specification; and this specification contains further constraints on the elements defined in referenced schemas.

Clients:

Client implementations MAY implement either Restful AtomPub Binding or the Web Services Binding.

Repositories:

Repositories MUST implement the following CMIS protocol bindings:

~~□~~i. Restful AtomPub Binding

~~□~~ii. Web Services Binding

Rest Binding:

This specification references a number of other specifications. In order to comply with this specification, an implementation MUST implement the portions of referenced specifications necessary to comply with the required provisions of this specification. Additionally, the implementation of the portions of the referenced specifications that are specifically cited in this specification MUST comply with the rules for those portions as established in the referenced specification.

Additionally normative text within this specification takes precedence over the CMIS RestAtom XML Schema. That is, the normative text in this specification further constrains the schemas and/or WSDL that are part of this specification; and this specification contains further constraints on the elements defined in referenced schemas.

The CMIS RestAtom XML takes precedence over any examples or non-normative outlines included either in this document or as standalone examples.

Web Services Binding:

Normative text within this specification takes precedence over the CMIS Messaging XML and CMIS WSDL. That is, the normative text in this specification further constrains the schemas and WSDL that are part of this specification; and this specification contains further constraints on the elements defined in referenced schemas.

The CMIS Messaging XML and CMIS WSDL takes precedence over any examples or non-normative outlines included either in this document or as standalone examples.

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B. Non-Normative Text

C. Revision History

Revision	Date	Editor	Changes Made
1.0	01/11/2010	Al Brown	First specification