CDMI 1.0.2 Errata

for Cloud Data Management Interface Version 1.0.2

Trac Ticket #690 PAS UK Issue #1 - Line Numbering

Description: Add line numbering to specification document.

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #691 PAS UK Issue #2 - Normative Language

Description

We follow Annex H (Verbal forms for the expression of provisions) of the ISO/IEC Directives, Part 2, where shall, should and may shall be lower case.

Marie to add text to Clause 4 that indicates our usage of normative language complies with RFC 2119 and ISO Directives Part 2, Annex H.

Add additional changes where identified to clarify normative requirements of the specification.

CHANGES Made the following changes to Version 1.0.2a:

1 Added the following to Clause 4 - Conventions:

4.4 Key Word Requirements

In this international standard, the key words in Table 1 SHALL be interpreted as described in RFC 2119.

Table 1 - Key Word Requirements

Key Words	Description
SHALL MUST REQUIRED	An action described with any of these key words is unconditionally required.
SHALL NOT MUST NOT	An action described with either of these key word phrases is unconditionally prohibited.

Table 1 - Key Word Requirements

Key Words	Description
SHOULD RECOMMENDED	Valid reasons may exist in specific circumstances to ignore a particular action described with either of these key words, but the full implications MUST be understood and carefully weighed before choosing a different course.
SHOULD NOT NOT RECOMMENDED	Valid reasons may exist in specific circumstances to accept a particular action described by either of these key word phrases, but the full implications SHOULD be understood and the case carefully weighed before implementing any action described with these key words.
MAY OPTIONAL	An action described with either of these key words is truly optional. One vendor may choose to include the option because a particular marketplace requires it or because the vendor feels that it enhances the product, while another vendor may omit the same option. An implementation which does not include a particular option MUST be prepared to interoperate with another implementation which does include the option, though perhaps with reduced functionality. Likewise, an implementation which does include a particular option MUST be prepared to interoperate with another implementation that does not include the option (except, of course, for the feature the option provides).

2 Added the following to Clause 2 - References:

RFC 2119, *Key Words for Use in RFCs to Indicate Requirement Levels* - http://tools.ietf.org/html/rfc2119

Trac Ticket #692 PAS UK Issue #3 - Meaning of No Request Header Specified

Description:

This text is used when the CDMI standard is not defining any changes beyond what is specified in the HTTP standard. In order to use normative language, the following changes are proposed:

8.4.4: Replace with "A request body shall not be provided."

8.5.4: Replace with "A request body shall not be provided."

8.6.6: Replace with "A response body may be provided as per RFC 2616."

8.7.6: Replace with "A response body may be provided as per RFC 2616."

8.8.4: Replace with "A request body may be provided as per RFC 2616."

8.8.5: Replace with "Response headers may be provided as per RFC 2616."

8.8.6: Replace with "A response body may be provided as per RFC 2616."

8.9.3: Replace with "Request headers may be provided as per RFC 2616."

8.9.4: Replace with "A request body may be provided as per RFC 2616."

8.9.5: Replace with "Response headers may be provided as per RFC 2616."

8.9.6: Replace with "A response body may be provided as per RFC 2616."

9.3.3: Replace with "Request headers may be provided as per RFC 2616."

9.3.4: Replace with "A request body shall not be provided."

9.3.5: Replace with "Response headers may be provided as per RFC 2616."

9.3.6: Replace with "A response body may be provided as per RFC 2616."

9.4.4: Replace with "A request body shall not be provided."

9.5.3: Replace with "Request headers may be provided as per RFC 2616."

9.5.4: Replace with "A request body shall not be provided."

9.6.6: Replace with "A response body may be provided as per RFC 2616."

9.7.4: Replace with "A request body may be provided as per RFC 2616."

9.7.5: Replace with "Response headers may be provided as per RFC 2616."

9.7.6: Replace with "A response body may be provided as per RFC 2616."

9.8.3: Replace with "Request headers may be provided as per RFC 2616."

9.8.4: Replace with "A request body may be provided as per RFC 2616."

9.8.5: Replace with "Response headers may be provided as per RFC 2616."

9.8.6: Replace with "A response body may be provided as per RFC 2616."

9.10.6: Replace with "A response body may be provided as per RFC 2616."

10.3.4: Replace with "A request body shall not be provided."

10.4.6: Replace with "A response body may be provided as per RFC 2616."

10.5.5: Replace with "Response headers may be provided as per RFC 2616."

10.5.6: Replace with "A response body may be provided as per RFC 2616."

11.3.4: Replace with "A request body shall not be provided."

11.4.6: Replace with "A response body may be provided as per RFC 2616."

11.5.4: Replace with "A request body may be provided as per RFC 2616."

11.5.5: Replace with "Response headers may be provided as per RFC 2616."

11.5.6: Replace with "A response body may be provided as per RFC 2616."

11.6.5: Replace with "Response headers may be provided as per RFC 2616."

11.6.6: Replace with "A response body may be provided as per RFC 2616."

11.7.4: Replace with "A request body may be provided as per RFC 2616."

11.7.5: Replace with "Response headers may be provided as per RFC 2616."

11.7.6: Replace with "A response body may be provided as per RFC 2616."

12.2.4: Replace with "A request body shall not be provided."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #693

PAS UK Issue #4 - Relative URIs

Description:

Explanatory section is to be added to section 5.13 that explains that URIs are relative to the "Root URI":

Add:

5.13.5 Use of URIs

The format and syntax of URIs are defined by RFC 3986 [RFC3986].

Every CDMI client shall maintain one or more "Root URI" that each correspond to a root container on the CDMI server. Since all URIs to CDMI containers end in a trailing slash, all root URIs will end in a trailing slash.

All URIs in the international standard are relative to the root URI unless otherwise noted. As a consequence, the algorithm used for calculating the resolved URI is as described in section 5.2 of RFC 3986.

The below table illustrates how relative URIs are resolved against root URIs:

Root URI Relative URI Resolved URI

1: http://cloud.example.com/ + cdmi_object/testObject => http://cloud.example.com/cdmi_object/testObject

2: http://cloud.example.com/ + /cdmi_object/testObject => http://cloud.example.com/cdmi_object/testObject

3: http://cloud.example.com/p1/ + cdmi_object/testObject => http://cloud.example.com/p1/cdmi_object/testObject

4: http://cloud.example.com/p1/ + /cdmi_object/testObject => http://cloud.example.com/cdmi_object/testObject

5: http://cloud.example.com/p1/p2/ + cdmi_object/testObject => http://cloud.example.com/p1/p2/cdmi_object/testObject

6: http://cloud.example.com/p1/p2/ + /cdmi_object/testObject => http://cloud.example.com/cdmi_object/testObject

This international standard places no restrictions on root and relative URIs, and all of the examples in the above table are valid.

All examples use a root URI of "http://cloud.example.com/" and return absolute-path references, as in the second line of the above table.

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #694 PAS UK Issue #5 - Access Lifecycle

Description:

Add to end of section 5.8:

CDMI defines two namespaces that can be used to access stored objects, a flat object ID namespace and a hierarchical path-based namespace. Support for objects accessed by object ID is indicated by the system-wide capability "cdmi_object_access_by_ID", and support for objects accessed by hierarchical path is indicated by the container capability "cdmi_create_dataobject" found on the root container (and any subcontainers).

Objects are created by ID by performing an HTTP POST against a special URI, designated as /cdmi_objectid/ (see 9.9). Subsequent to creation, objects are modified by performing PUTs using the object ID assigned by the CDMI server, using the /cdmi_objectid/ URI (see 8.6). The same URI is used to retrieve and delete objects by ID.

Objects are created by name by performing an HTTP PUT to the desired path URI (see 8.2). Subsequent to creation, objects are modified by performing PUTs using the object path specified by the client (see 8.6). The same URI is used to retrieve and delete objects by path.

CDMI defines mechanisms so that objects having only an object ID can be assigned a path location within the hierarchical namespace, and so that objects having both an object ID and path can have their path dropped, such that the object only has an object ID. This function is accomplished by using a "move" modifier to a PUT or POST operation, as shown in Figure __.

<Insert attached diagram>

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #695 PAS UK Issue #6 - Fix DaaS Definition

Description

1. Delete note in definition 3.6
2. Add ISO definition for service level.
3. Replace "DaaS" definition with the below three definitions:
   - Data Storage as a Service - delivery of virtualized storage and data services on demand over a network, based on a request for a given service level that hides limits to scalability, is either self-provisioned or provisionless, and is billed based on consumption.
   - DaaS - Short for Data Storage as a Service
   - Cloud Storage - Short for Data Storage as a Service

CHANGES

1. Deleted note.
2. ISO definition for service level - **pending**.
3. Updated the definition. Created a new entry for cloud storage.

All changes made to Version 1.0.2a.

Trac Ticket #696 PAS UK Issue #7 - Fix Domain Definition

Description:

Replace domain definition (3.7) with the following:

domain - a shared user authorization database that contains users, groups, and their security policies, and associated accounting information.

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #697 PAS UK Issue #8 - Fix Eventual Consistency Definition

Description:

Delete note in definition 3.8

Replace eventual consistency definition (3.8) with the following:

a behavior of transactional systems that does not provide immediate consistency guarantees to provide enhanced system availability and tolerance to network partitioning

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #698 PAS UK Issue #9 - Fix Object ID Definition

Description:

Update 3.16 definition to:

object ID (OID) - a globally unique value assigned at creation time to identify an object

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #699 PAS UK Issue #10 - Fix OCCI Reference

Description:

Marie to add reference to the OCCI specification.

CHANGES Added a reference to Appendix C of Version 1.0.2a.

Trac Ticket #700 PAS UK Issue #11 - Fix Public Cloud Definition

Description:

In definition 3.20, replace "relatively unrestricted" with "in principle unrestricted".

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #701 PAS UK Issue #12 - Fix REST Definition

Description:

In definition 3.21, remove note and add link to REST bibliography entry.

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #702 PAS UK Issue #13 - Fix URI Definition

Description:

Add reference to RFC 3986 to definition 3.27.

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #703 PAS UK Issue #14 - Remove “propose a model”

Description:

In 5.1, first paragraph, replace "proposes a model" with "defines a model".

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #704 PAS UK Issue #15 - Remove “business cases”

Description:

In 5.1, third paragraph, replace "business cases and offerings" with "business use cases".

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #705 PAS UK Issue #16 - Add definition for “virtualization”

Description:

Need to add a definition for virtualization to Clause 3.

Virtualization - Presentation of resources as if they are physical, when in fact, they are decoupled from the underlying physical resources.

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #706 PAS UK Issue #17 - Add definitions for for CIFS, NFS, POSIX & WebDAV

Description:

In Clause 3, add the following definitions:

- CIFS - Common Internet File System
- NFS - Network File System
- POSIX - Portable Operating System Interface
- WebDAV - Web Distributed Authoring and Versioning

CHANGES Added POSIX and WebDAV to Version 1.0.2a (CIFS AND NFS were already there). In addition, added cross-references for POSIX to IEEE Std 1003.1 and for WebDAV to RFC 4918.

Trac Ticket #707 PAS UK Issue #18 - Remove Table Space Paragraph

Description:

Remove following paragraph from 5.3:

"Another type of DaaS offering is one of simple table space storage, allowing for horizontal scaling of database operations that certain applications need. Rather than virtualizing relational database instances, table space storage offers a new data storage interface that emphasizes scalability while placing known limits on functionality. Scalability allows the tables to be partitioned across multiple database nodes based on common key values. This model provides horizontal scalability at the expense of functions that may typically only be implemented by a vertically-scaled relational database."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #708 PAS UK Issue #19 - Remove “soft container” phrase

Description:

Delete sentence from 5.3:

"The type of container defined in this international standard is called a “soft” container, as shown in Figure 2."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #709 PAS UK Issue #20 - Remove “SIRDM”

Description:

1. Remove SIRDM definition (3.24).
2. In 5.4, remove the following items:

   Remove paragraph: "The SNIA Storage Industry Resource Domain Model (SIRDM) provides a way to address the need for cloud storage to remain simple (see Figure 3 and SIRDM). By using the different types of metadata discussed in the SIRDM model for a cloud storage interface, an interface may be created that allows offerings to meet the requirements of the data without adding unnecessary complexity to the management of that data."
3. Remove figure 3.

   Remove paragraph: "The SIRDM (see SIRDM) defines information services as services that understand the context of the data. Information services are thus able to determine the requirements of the data and automatically mark the data system metadata for that data."
4. Remove SIRDM reference from Annex B.

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #710 PAS UK Issue #21 - Change "principle" to "principal"

Description:

In 5.7, replace:

"determine how user credentials are mapped to principles used in an Access Control List (ACL),"

with

"determine how user credentials are mapped to principals used in an Access Control List (ACL),"

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #711 PAS UK Issue #23 - Clarify difference between object and value

Description:

In 5.8, replace:

"A subsequent GET will fetch the data object and its value."

with

"A subsequent GET will fetch the data object, including the value field."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #712 PAS UK Issue #24 - Clarify language around component of objects

Description:

In 5.9, replace:

"User metadata is arbitrarily-defined JSON strings that are specified by the CDMI client and is a component of objects."

with

"User metadata consists of client-defined JSON strings, arrays, and objects that are stored in the metadata field."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #713 PAS UK Issue #25 - Fix normative language

Description:

In 5.10, replace:

"Every object stored within a CDMI-compliant system shall have a globally unique object identifier (ID) assigned at creation time. The CDMI object ID is a string with requirements for how it is generated and how it obtains its uniqueness. Each offering that implements CDMI is able to produce these identifiers without conflicting with other offerings."

with:

"Every object stored within a CDMI-compliant system shall have a globally unique object identifier (ID) assigned at creation time. The CDMI object ID shall be a string generated as defined in 5.11. Each offering that implements CDMI shall be able to produce these identifiers without conflicting with other offerings."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #714 PAS UK Issue #26 - Explain limitations on Content Type

Description:

1 In 5.13.2, replace:

"A client may optionally supply an HTTP Accept header. If a request body is present, the client shall provide a Content-Type header. If a response body is present, the server shall provide a Content-Type header. If the client does not provide a Content-Type header when required, the server shall return a 406 Not Acceptable status code. See Section 12 of RFC 2616."

with

"For CDMI operations, media types for CDMI objects are used as defined in RFC 6208.

A client may optionally supply an HTTP Accept header, as per section 14.1 of RFC 2616. If a client is restricting the response to a specific CDMI media type, the corresponding media type shall be specified in the Accept header. Otherwise, the Accept header may contain "*/*", a list of media types, or be omitted.

If a request body is present, the client shall include a Content-Type header, as per section 14.17 of RFC 2616. If the client does not provide a Content-Type header when required, or provides a media type in the Content-Type header that does not match with the existing resource media type, the server shall return a 400 Bad Request status code.

If a response body is present, the server shall provide a Content-Type header.

Clauses on in this international standard further may qualify content negotiation (for example, in 9.3, where the absence of a Content-Type has a specific meaning)"

2 In 8.2.4, Accept row, replace:

"application/cdmi-object"

with

"application/cdmi-object" or a consistent value as per 5.13.2

and replace

"Mandatory"

with

"Optional"

3 In 8.4.3, Accept row, replace:

"application/cdmi-object". This header shall contain a list of one or more of the five CDMI MIME types (see RFC 6208).

with

"application/cdmi-object" or a consistent value as per 5.13.2

and replace

"Mandatory"

with

"Optional"

4 In 9.2.4, Accept row, replace:

"application/cdmi-container"

with

"application/cdmi-container" or a consistent value as per 5.13.2

and replace

"Mandatory"

with

"Optional"

5 In 9.4.3, Accept row, replace:

"application/cdmi-container". This header shall contain a list of one or more of the five CDMI MIME types (see RFC 6208).

with

"application/cdmi-container" or a consistent value as per 5.13.2

and replace

"Mandatory"

with

"Optional"

6 In 9.9.4, Accept row, replace:

"application/cdmi-object"

with

"application/cdmi-object" or a consistent value as per 5.13.2

and replace

"Mandatory"

with

"Optional"

7 In 9.11.4, Accept row, replace:

"application/cdmi-queue"

with

"application/cdmi-queue" or a consistent value as per 5.13.2

and replace

"Mandatory"

with

"Optional"

8 In 10.2.3, Accept row, replace:

"application/cdmi-domain"

with

"application/cdmi-domain" or a consistent value as per 5.13.2

and replace

"Mandatory"

with

"Optional"

9 In 10.3.3, Accept row, replace:

"application/cdmi-domain". This header shall contain a list of one or more of the five CDMI MIME types (see RFC 6208).

with

"application/cdmi-domain" or a consistent value as per 5.13.2

and replace

"Mandatory"

with

"Optional"

10 In 11.3.3, Accept row, replace:

"application/cdmi-queue". This header shall contain a list of one or more of the five CDMI MIME types (see RFC 6208).

with

"application/cdmi-queue" or a consistent value as per 5.13.2

and replace

"Mandatory"

with

"Optional"

11 In 12.2.3, Accept row, replace:

"application/cdmi-capability". This header shall contain a list of one or more of the five CDMI MIME types (see RFC 6208).

with

"application/cdmi-capability" or a consistent value as per 5.13.2

and replace

"Mandatory"

with

"Optional"

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #715

PAS UK Issue #27 - Clarify Normative Status of Examples

Description:

In 6.1, replace:

"This clause illustrates the following CDMI content-type operations:"

with

"All examples included in this international standard are informative.

This clause includes examples for the following CDMI content-type operations:"

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #716 PAS UK Issue #28 - Normative Language in Table 4

Description:

1 Move Table 4 to 5.8, under Figure 5.

2 Drop 7.2.

3 In this table, in the Data Objects row, replace:

"Data objects have a value but have no children."

with

"Data objects are used to store values and provide functionality similar to files in a filesystem."

4 In this table, in the Container Objects row, replace:

"Container objects may have child objects but have no value. Container objects may be exported via protocols other than CDMI for data path operations, but the associated value is not represented in container objects via the CDMI data path."

with

"Container objects have zero or more children, but do not store values. They provide functionality similar to directories in a filesystem."

5 In this table, in the Domain Objects row, replace:

"Domain objects may have child objects but have no value."

with

"Domain objects represent administrative groupings for user authentication and accounting purposes."

6 In this table, in the Queue Objects row, replace:

"Queue objects have a value but have no children."

with

"Queue objects store zero or move values and are accessed in a first-in-first-out manner."

7 In this table, in the Capability Objects row, replace:

"Capability objects may have child objects but have no value."

with

"Capability objects describe the functionality implemented by a CDMI server and are used by a client to discover supported functionality."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #717 PAS UK Issue #29 - Replace "point" with "redirect"

Description:

1 In 7.3,

— Replace:

"Object references are URIs within the cloud storage namespace that point to another URI within the same or another cloud storage namespace."

with

"Object references are URIs within the cloud storage namespace that redirect to another URI within the same or another cloud storage namespace."

— Replace:

"References by object ID must always point to a URI that ends with the same object ID as the request URI."

with

"References by object ID must always redirect to a URI that ends with the same object ID as the request URI."

2 In 8.2.5, "reference" row, replace:

"URI of a CDMI data object that shall be pointed to by a reference."

with

"URI of a CDMI data object that shall be redirected to by a reference."

3 Do a global search and replace of:

"The server shall respond with the URI that the reference points to if the object is a reference."

with

"The server shall respond with the URI that the reference redirects to if the object is a reference."

4 In 9.2.5, "reference" row, replace:

"URI of a CDMI container object that shall be pointed to by a reference."

with

"URI of a CDMI container object that shall be redirected to by a reference."

5 In 9.9.5, "reference" row, replace:

"URI of a CDMI data object that shall be pointed to by a reference."

with

"URI of a CDMI data object that shall be redirected to by a reference."

6 In 9.11.5, "reference" row, replace:

"URI of a CDMI queue object to which a reference points. No other fields may be specified when creating a reference."

with

"URI of a CDMI queue object that shall be redirected to by a reference. If other fields from this table are supplied when creating a reference, the server shall respond with a 400 Bad Request error response."

7 In 11.2.5, "reference" row, replace:

"URI of a CDMI queue object to which a reference points. No other fields may be specified when creating a reference."

with

"URI of a CDMI queue object that shall be redirected to by a reference. If other fields from this table are supplied when creating a reference, the server shall respond with a 400 Bad Request error response."

8 In 12.1, paragraph 6, replace:

"Every CDMI data object, container object, domain object, and queue object shall have a capabilitiesURI field that contains a valid URI that points to a capabilities object."

with

"Every CDMI data object, container object, domain object, and queue object shall have a capabilitiesURI field that contains a valid URI of a capabilities object."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #718

PAS UK Issue #30 - Clarify deserialization fields

Description:

In 8.1, replace the last sentence:

"When a client provides or includes deserialization fields that are not defined in this specification, these fields shall be stored as part of the object."

with

"When a client provides fields not defined in this international standard, or deserializes an object containing fields that are not defined in this international standard, these fields shall be stored as part of the object, but not interpreted."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #720 PAS UK Issue #31 - Normative statements in Synopsis

Description:

1 In 8.2.1 Synopsis, replace:

The following HTTP PUT creates a new data object at the specified URI.

```
PUT <root URI>/<ContainerName>/<DataObjectName>
```

with

To create a new data object, the following request shall be performed:

```
PUT <root URI>/<ContainerName>/<DataObjectName>
```

2 In 8.2.1 Synopsis, remove:

"After it is created, the data object shall also be accessible at <root URI>/cdmi_objectid/<objectID>."

This is no longer required because of the text added in ticket #694.

Equivalent changes need to be made for each synopsis. These changes will be added as subsequent comments to this ticket.

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #721 PAS UK Issue #32 - Normative Language Issues

Description:

1 In 8.2.2, 9.2.2, 9.9.2, 9.11.2, 11.2.2, replace:

"The server shall return an object ID along with 202 Accepted."

with

"The server shall return a Location header with a URI to the object to be created along with an HTTP status code of 202 Accepted."

2 In 8.2.2, 9.2.2, 9.9.2, 9.11.2, 11.2.2, replace:

"Future accesses to the URI created (or the object ID) shall succeed except when delays occur due to an implementation's use of eventual consistency."

with

"A client might not be able to immediately access the created object, e.g., due to delays resulting from the implementation's use of eventual consistency."

3 In 9.6, the "Delayed Completion of Snapshot" should be a numbered heading.

4 In "Delayed Completion of Snapshot", replace:

"Future accesses to the snapshot URI created (or the object ID) shall succeed except when delays occur due to an implementation's use of eventual consistency."

with

"A client might not be able to immediately access the snapshot, e.g., due to delays resulting from the implementation?s use of eventual consistency."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #722 PAS UK Issue #33 - Mimetype bullet in wrong place

Description:

In 8.2.5, in the "metadata" row, the last bullet, as shown below, should be in the "mimetype" row.

- This MIME type value shall be converted to lower case before being stored.

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #723 PAS UK Issue #34 - Clarify Reference Field Exclusion

Description:

1 In 8.2.5, in the "reference" row of the table, replace the description:

"URI of a CDMI data object that shall be pointed to by a reference. If other fields from this table are supplied when creating a reference, the server shall respond with a 400 Bad Request error response."

with

"URI of a CDMI data object that shall be redirected to by a reference. If any other fields are supplied when creating a reference, the server shall respond with an HTTP status code of 400 Bad Request."

2 In 9.2.5, in the "reference" row of the table, replace the description with:

"URI of a CDMI container object that shall be pointed to by a reference. If other fields from this table are supplied when creating a reference, the server shall respond with a 400 Bad Request error response."

with

"URI of a CDMI container object that shall be redirected to by a reference. If other fields are supplied when creating a reference, the server shall respond with an HTTP status code of 400 Bad Request."

3 In 9.9.5, in the "reference" row of the table, replace the description with:

"URI of a CDMI data object that shall be pointed to by a reference. If other fields from this table are supplied when creating a reference, the server shall respond with a 400 Bad Request error response."

with

"URI of a CDMI data object that shall be redirected to by a reference. If other fields are supplied when creating a reference, the server shall respond with an HTTP status code of 400 Bad Request."

4 In 9.11.5, in the "reference" row of the table, replace the description with:

"URI of a CDMI queue object to which a reference points. No other fields may be specified when creating a reference."

with

"URI of a CDMI queue object that shall be redirected to by a reference. If other fields are supplied when creating a reference, the server shall respond with an HTTP status code of 400 Bad Request."

5 In 11.2.5, in the "reference" row of the table, replace the description with:

"URI of a CDMI queue object to which a reference points. No other fields may be specified when creating a reference."

with

"URI of a CDMI queue object that shall be redirected to by a reference. If other fields are supplied when creating a reference, the server shall respond with an HTTP status code of 400 Bad Request."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #724 PAS UK Issue #35 - Clarify Reference Field Extension

Description:

In 8.2.7, 9.27, 10.26, and 11.27, in the objectName, parentURI and parentID rows, delete all bullets.

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #725 PAS UK Issue #36 - Fix copy/paste error

Description:

In each "parentID" row, delete the following sentence.

"Appending the objectName to the parentURI shall always produce a valid URI for the object."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #726 PAS UK Issue #37 - Remove DSMD mention from capabilitiesURI

Description:

Remove all instances of the sentence "The capabilities URI returned is based on the object type and requested data system metadata fields." from the specification.

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #727 PAS UK Issue #39 - Location Header Conditional

Description:

In 8.4.5, 8.5.5, 8.6.5, 8.7.5, 9.4.5, 9.5.5, 9.6.5, 10.3.5, 10.4.5, 11.3.5, 11.4.5, in the "Location" table row, change the requirement from "Mandatory" to "Conditional".

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #728 PAS UK Issue #40 - Clarify that not returned is also not exists

Description:

1 For all instances in the specification where we say,
"the objectName field shall not be returned."
replace with
"the objectName field does not exist and shall not be returned.

2 For all instances in the specification where we say,
"the parentURI field shall not be returned."
replace with
"the parentURI field does not exist and shall not be returned.

3 For all instances in the specification where we say,
"the parentID field shall not be returned."
replace with
"the parentID field does not exist and shall not be returned.

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #729 PAS UK Issue #43 - Remove non-CDMI GET of fields/metadata

Description:

1 In 8.5.1, remove the following lines:

```
GET <root URI>/<ContainerName>/
   <DataObjectName>?<fieldname>;<fieldname>;...

GET <root URI>/<ContainerName>/
   <DataObjectName>?metadata:<prefix>;...
```

2 In 8.5.1, remove the following lines:

<fieldname> is the name of a field.

<prefix> is a matching prefix that returns all metadata items that start with the prefix value.

3 In 8.5.2, remove the following line:

— Support for the ability to read the metadata of an existing data object is indicated by the presence of the "cdmi_read_metadata" capability in the specified object.

4 In 8.5.5, replace:

If a field was not specified, or the value field was specified, the content-type returned shall be the mimetype field in the data object.

If a non-value field was specified, the content-type shall be "application/json".

with

The content-type returned shall be the mimetype field in the data object.

5 In 8.5.6, replace:

If no fields were specified in the request or the value field was specified in the request, the response message body shall be the contents of the data object's value field.

with

The response message body shall be the contents of the data object's value field."

6 In 8.5.6, remove the following lines:

— If a field other than the value field was specified in the request, the value of that specified field shall be returned in JSON format.

— Requesting an optional field that is not present shall result in an HTTP status code of 404 Not Found.

— Requesting an undefined field shall result in an HTTP status code of 400 Bad Request.

7 In 8.5.8 remove Example 2.

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #730 PAS UK Issue #44 - Clarify Updating of References

Description:

1 In 7.3, add the following text after "A delete operation on a reference URI shall delete the reference.":

"References cannot be updated. To change to where a reference redirects a client, the reference shall first be deleted then re-created."

2 In 7.3, replace:

"References by object ID must always point to a URI that ends with the same object ID as the request URI."

with

"References by object ID shall always redirect to a URI that ends with the same object ID as the request URI."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #731 PAS UK Issue #46 - Fix Normative Language

Description:

1 In 8.1, replace the third paragraph,

The first example addresses the data object by URI, and the second addresses the data object by object ID. Every data object has a single, globally-unique object identifier (ID) that remains constant for the life of the object. Each data object may also have one or more URI addresses that allow the object to be accessed.

with

The first example addresses the data object by URI, and the second addresses the data object by object ID. Every data object has a single, globally-unique object identifier (ID) that remains constant for the life of the object. Each data object shall have one or more URI addresses that allow the object to be accessed.

2 In 9.1, replace the third paragraph,

The first example addresses the container object by URI, and the second addresses the container object by CDMI object ID. Every container object has a single, globally-unique object identifier (ID) that remains constant for the life of the object. Each container object may also have one or more URI addresses that allow the container object to be accessed.

with

The first example addresses the container object by URI, and the second addresses the container object by CDMI object ID. Every container object has a single, globally-unique object identifier (ID) that remains constant for the life of the object. Each container object shall have one or more URI addresses that allow the container object to be accessed.

3 In 11.1, replace the third paragraph,

The first example addresses the queue object by URI, and the second addresses the queue object by object ID. Every queue object has a single, globally-unique object identifier (ID) that remains constant for the life of the object. Each queue object may also have one or more URI addresses that allow the object to be accessed.

with

The first example addresses the queue object by URI, and the second addresses the queue object by object ID. Every queue object has a single, globally-unique object identifier (ID) that remains constant for the life of the object. Each queue object shall have one or more URI addresses that allow the object to be accessed.

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #733 PAS UK Issue #47 - Clarify Access by ID/Name

Description:

In 8.1, 9.1, and 11.1, replace:

by URI

with

by name

Note: Two replacements in each subclause are required.

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #734 PAS UK Issue #48 - Clarify Nested Containers

Description:

In 9.1, paragraph 5, replace:

Containers may also be nested, as follows:

http://cloud.example.com/container/sub-container/

A container object may have a parent object. In this case, the container object inherits data system metadata from its parent object.

EXAMPLE 1 The "sub-container" container object may inherit its data system metadata from the parent container object "container".

with

Containers may also be nested.

EXAMPLE 1 The following URI represents a nested container:

http://cloud.example.com/container/sub-container/

A nested container has a parent container object, shall be included in the children field of the parent container object, and may inherit data system metadata from its parent container.

CHANGES Made the specified changes to Version 1.0.2a.

1. Check for consistency around sub-container (change to subcontainer).
2. In clause 9.1, replace:

   "...and may inherit data system metadata from its parent..."

   with

   "...and shall inherit data system metadata and ACLs from its parent..."

CHANGES Made the specified changes to Version 1.0.2b and 1.1c.

Trac Ticket #735 PAS UK Issue #51 - Add Conditional Where Needed

Description:

Change to conditional where needed. Use Ticket #644 as a starting point.

The following changes shall be made to the spec:

1. All objectName, parentURI and parentID fields in response body tables should have their "Requirement" column set to "Conditional".
2. The value field in section 8.4.6 and 11.3.6 should have its "Requirement" column set to "Conditional".
3. All Location HTTP headers in header tables that refer to a "reference" should have their "Requirement" column set to "Conditional".

   Specifically in sections: 8.4.5, 8.5.5, 8.6.5, 8.7.5, 9.4.5, 9.5.5, 9.6.5, 10.3.5, 10.4.5, 11.3.5, 11.4.5

Note: Some corrections to the above:

objectName, parentURI and parentID should be left as Mandatory in the following sections, as these sections no longer have conditional statements as a result of another change:

- 8.2.7
- 9.2.7
- 11.2.7

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #736 PAS UK Issue #52 - Clarify child ranges

Description:

1 In 9.1, below "Children ranges are specified in a way that is similar to byte ranges as per Section 14.35.1 of RFC 2616.", add the following text:

"A client can determine the number of children present by requesting the "children-range" field without requesting a range of children."

2 In 9.2.7, "childrenrange" row, replace:

"The range of the children returned in the children field"

with

"The children of the container expressed as a range. If a range of children is requested, this field indicates the children returned as a range."

3 In 9.4.6, "childrenrange" row, replace:

"The range of the children returned in the children field"

with

"The children of the container expressed as a range. If a range of children is requested, this field indicates the children returned as a range."

4 In 10.2.6, "childrenrange" row, replace:

"The range of the children returned in the children field"

with

"The sub-domains of the domain expressed as a range. If a range of sub-domains is requested, this field indicates the children returned as a range."

5 In 10.3.5, "childrenrange" row, replace:

"The range of the children returned in the children field"

with

"The sub-domains of the domain expressed as a range. If a range of sub-domains is requested, this field indicates the children returned as a range."

6 In 12.2.6, "childrenrange" row, replace:

"The range of the children returned in the children field"

with

"The child capabilities of the capability expressed as a range. If a range of child capabilities is requested, this field indicates the children returned as a range."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #737 PAS UK Issue #54 - Clarify character restrictions for names

Description:

1 Include changes in ticket #646.

2 In 5.13.4, replace:

Field names and values contained within the request body and response body shall not be escaped.

with

Field names and values contained as stored and sent in the request body and response body shall not be escaped.

3 Add a new section to 5.13:

5.13.5 Reserved Characters

The name of CDMI data objects, container objects, queue objects, domain objects and capability objects shall not contain the "/" or "?" characters, as these characters are reserved for delimiters.

Note: There is a typo in the above change, and the wording is awkward. A better version is:

"Field names and values shall not be escaped when stored and when sent in request and response bodies."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #739 Capitalization and Font for Request and Response Header in Paragraphs

Description:

Review capitalization and whether to apply fixed-width font to header names in text paragraphs. Header names include:

- Accept
- X-CDMI-Specification-Version
- Content-Type
- Location
- X-CDMI-Partial
- Range

I recommend the following changes:

- Accept
  - — Clause 5 - line 296 - capitalize
  - — Clause 9 - lines 119, 458, 856 - don't capitalize

  - Clause 11 - line 92 - don't capitalize
- Content-Type - Clause 5
  - Lines 189, 300, 301, 302 - capitalize
  - Line 157 - change "Content-Type" to "content type".
  - Tables 13, 18, 26, 42, 57, 93, 115 - change "content-type" to "content type"
- Content-Length - Clause 5 - Line 189 - capitalize
- Range - Clause 5 - Line 308 - capitalize

TWG: Make changes to 1.1 and 1.0.2; do not change headers to fixed-width font.

CHANGES Made the specified changes to Version 1.1c and 1.0.2b.

Trac Ticket #741 Misc. editorial changes

Refer to markups in CDMI_Spec 1.1b.pdf.

Clause 20

Line 61 - Change “will” to “shall.”

CHANGES Made the specified changes to 1.0.2b.

Trac Ticket #742 PAS UK Issue #55 - Clarify trailing slash for containers

Description:

In 9.1, insert at the end of the third paragraph:

Replace:

> The first example addresses the container object by URI, and the second addresses the container object by CDMI object ID. Every container object has a single, globally-unique object identifier (ID) that remains constant for the life of the object. Each container object may also have one or more URI addresses that allow the container object to be accessed.

with

> The first example addresses the container object by URI, and the second addresses the container object by CDMI object identifier (ID). Every container object has a single, globally-unique object ID that remains constant for the life of the object. Each container object may also have one or more URI addresses that allow the container object to be accessed. Following the URI conventions for hierarchical paths, container URIs shall consist of one or more container names that are separated by forward slashes ("/") that end with a forward slash ("/").

If a request is performed against an existing container resource and the trailing slash at the end of the URI is omitted, the server shall respond with an HTTP status code of 301 Moved Permanently HTTP, and the Location header containing the URI with the trailing slash will be added.

If a CDMI request is performed to create a new container resource and the trailing slash at the end of the URI is omitted, the server shall respond with an HTTP status code of 400 Bad Request.

Non-CDMI requests to create a container resource shall include the trailing slash at the end of the URI; otherwise, the request shall be considered a request to create a data object.

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #743 PAS UK Issue #56 - Define meaning of percentComplete

Description:

Search and replace

The value shall be an integer numeric value from 0 through 100.

with

- When the value of completionStatus is "Processing", this field, if provided, shall indicate the percentage of completion as a numeric integer value from 0 through 100.
- When the value of completionStatus is "Complete", this field, if provided, shall contain the value "100".
- When the value of completionStatus is "Error", this field, if provided, may contain any integer value from 0 through 100.

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #744 Global editorial changes

Refer to markups in CDMI_Spec 1.1b.pdf.

1 Ensure all HTTP status code descriptions are sentences (for consistency) (see trac ticket #741). Some descriptions vary, depending on the section, but these descriptions should also be sentences.

- Global

  400 Bad Request - The request contains invalid parameters or field names.

  401 Unauthorized - The authentication credentials are missing or invalid.

- Tables 18 and 21

200 OK - The data object content was returned in the response.

206 Partial Content - A requested range of the data object content was returned in the response.

— Tables 25, 28, 48, 81, 97

204 No Content - The operation was successful; no data was returned.

— Table 77

200 OK - The domain object content was returned in the response.

— Table 93

200 OK - The queue object content was returned in the response.

— Table 115

200 OK - The capabilities object content was returned in the response.

2 Table titles - Font weight and size is inconsistent. Check styles; remove manual style changes.

3 Consider italicizing all field names; if so, add convention to Clause 4.

Field names included in the document are:

capabilities, capabilitiesURI, children, childrenrange, completionStatus, copy, deserialize, deserializevalue, domainURI, exports, metadata, mimetype, move, newDomain, objectID, objectName, objectType, parentID, parentURI, percentComplete, queueValues, reference, serialize, snapshots, value, valuerange, and valuetransferencoding.

TWG: Make all changes except leave field names as is (unitalicized). Apply changes to 1.1 and 1.0.2.

CHANGES Made the specified changes to Version 1.1c and 1.0.2b.

Trac Ticket #750 PAS UK Issue #57 - Make Snapshot Description Consistent

Description:

In 9.4.6, in the "snapshots" table row, replace:

URI(s) of the SnapShot container objects

with

"URIs of the snapshot container objects. See Clause 14.

This wording is consistent with what we have written in 9.2.7.

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #758 PAS UK Issue #59 - Snapshot Reference

Description:

In clause 9.6.1, "Delayed Completion of Snapshot", change the first paragraph from:

"If the Request Message Body contains a snapshot field, the server may return a response of 202 Accepted. Such a response has the following implications:"

to

"If the creation of a snapshot (see Clause 14) is requested by including a snapshot field in the request message body, the server may return an HTTP status code of 202 Accepted. Such a response has the following implications:"

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #759 PAS UK Issue #59 - Clarify POST create

Description:

1 In clause 9.9.1, replace:

"The following HTTP POST creates a new data object as a child of the specified container object URI.

```
POST <root URI>/<ContainerName>/
POST <root URI>/cdmi_objectid/
```

with

"To create a new data object in a specified container where the name of the data object is a server-assigned object identifier, the following request shall be performed:

```
POST <root URI>/<ContainerName>/
```

To create a new data object where the data object does not belong to a container and is only accessible by ID (see 5.8), the following request shall be performed:

```
POST <root URI>/cdmi_objectid/
```

2 In clause 9.11.1, replace:

"The following HTTP POST creates a new queue object as a child of the specified container object URI.

```
POST <root URI>/<ContainerName>/
POST <root URI>/cdmi_objectid/
```

with

"To create a new queue object in a specified container where the name of the queue object is a server-assigned object identifier, the following request shall be performed.

```
POST <root URI>/<ContainerName>/
```

To create a new queue object where the queue object does not belong to a container and is only accessible by ID (see 5.8), the following request shall be performed.

```
POST <root URI>/cdmi_objectid/
```

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #760 PAS UK Issue #61 - Forward Reference to Queue

Description:

In clause 9.11.1, replace (text from Ticket #759):

"To create a new queue object in a specified container, where the name of the queue object is a server-assigned object identifier, the following request shall be performed:"

with:

"To create a new queue object (See Clause 11) in a specified container, where the name of the queue object is a server-assigned object identifier, the following request shall be performed:

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #761 PAS UK Issue #62 - Fix Typo (Should be Queue, not Data Object)

Description:

In clause 9.11.3, replace:

"The following capabilities describe the supported operations that may be performed when creating a new data object by ID in a container:"

with

"The following capabilities describe the supported operations that may be performed when creating a new queue object by ID in a container:"

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #762 PAS UK Issue #63 - Clarify queueValues

Description:

In Clause 9.11.7, 11.2.7 and 11.3.6, "queueValues" table row, replace:

"A range of values enqueued in the queue. The first value increases as items are deleted, and the second value increases as items are enqueued, e.g.,

- Create:->"",
- Enqueue:->"0-0",
- Enqueue:->"0-1",
- Enqueue:->"0-2",
- Delete:->"1-2",
- Delete:->"2-2",
- Delete:->"",and
- Enqueue:->"3-3".

Clients should ensure that they use sufficient precision (e.g., 64-bits) when storing these values in an internal representation to avoid overflow."

with

"The range of designators for enqueued values. Every enqueued value shall be assigned a unique, monotonically-incrementing positive integer designator, starting from 0. If no values are enqueued, an empty string shall be returned. If values are enqueued, the lowest designator, followed by a hyphen ("-"), followed by the highest designator shall be returned."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #763

PAS UK Issue #82 - Clarify SnapShot images

Description:

In section 14, replace:

"A snapshot is a point-in-time image of a container and its contents."

with:

"A snapshot is a point-in-time copy (image) of a container and all of its contents, including sub-containers and all data objects and queue objects."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #764

PAS UK Issue #83 - Fix Spelling Error

Description:

In Section 15.2, first bullet:

replace:

If the source specified is a data object, the canonical format shall contain tall data object fields, including the value, valuetransferencoding, and metadata fields.

with:

If the source specified is a data object, the canonical format shall contain all data object fields, including the value, valuetransferencoding, and metadata fields.

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #765 PAS UK Issue #90 - Fix Infrastructure Redundancy

Description:

In section 16.4, for cdmi_infrastructure_redundancy:

Remove the last sentence in column 3 that states:

Any two infrastructures may not share common elements, such as a network or power source.

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #766 PAS UK Issue #91 - Sanitize Definition

Description:

In section 16.4, table 118:

Add the following sentence to the end of the text in column 3 for cdmi_sanitization_method:

Sanitization is a process for deleting data that is intended to make the data unrecoverable.

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #767 PAS UK Issue #92 - Retention "governed"

Description:

In section 17.1, second sentence of 1st paragraph:

replace:

The implementation of retention and hold capabilities is governed by the presence of the cloud storage system-wide capabilities for retention and hold capabilities.

with:

The implementation of retention and hold capabilities is indicated by the presence of the cloud storage system-wide capabilities for retention and hold capabilities.

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #768 PAS UK Issue #94 - Autodeletion Title

Description:

In section 17.5, title:

replace:

CDMI Deletion

with:

CDMI Auto-deletion

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #769 PAS UK Issue #99 - Query Completion

Description:

1 In section 22.1, second paragraph, replace:

"The CDMI offering shall then perform the query, storing the query results in the query queue. As query results are found, they are added to the queue, and when the query is complete, the cdmi_query_status metadata of the queue is changed to indicate that the query has completed."

with

"The CDMI offering shall then perform the query using the content existing at the time the query is being processed, storing the query results in the query queue. As query results are found, they are added to the queue, and when the query is complete, the cdmi_query_status metadata of the queue is changed to indicate that the query has completed. Any matching objects created or modified while the query is being performed may or may not be included in the query results (e.g., as a consequence of eventual consistency)."

2 In clause 22.1, fourth paragraph, replace:

"After a query queue has been created, with the exception of cdmi_queue_type, the metadata items in this table cannot be altered. cdmi_queue_type can only be

removed, indicating to the system that the query queue shall no longer receive query results and shall be treated as a regular CDMI queue object."

with

"After a query queue has been created, with the exception of cdmi_queue_type, the metadata items in this table cannot be changed. If the value of cdmi_queue_type is changed from "cdmi_query_queue", this change indicates to the system that an in-process query shall be stopped, the query queue shall no longer receive query results, and the query queue shall be treated as a regular CDMI queue object. To start a new query with an existing queue, the value of the cdmi_queue_type shall be changed back to "cdmi_query_queue". This international standard does not define a mechanism to pause a running query or resume a stopped query."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #770 PAS UK Issue #64 - Clarify Field Value

Description:

1 In Clause 2, add:

"ISO 4217:2008, Codes for the representation of currencies and funds"

2 In Clause 10.1.2, Table 63, replace the description of the "cdmi_summary_charge" row:

"A free-form monetary measurement of the charge for the use of the service to the user of the domain"

With

"An ISO 4217 currency code (see ISO 4217:2008) that is followed or preceded by a numeric value and separated by a space, where the numeric value represents the closing charge in the indicated currency for the use of the service associated with the domain over the summary time period"

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #771 PAS UK Issue #63#2 - Clarify Power/Energy

Description:

In Clause 10.1.2, Table 63, replace the description of the "cdmi_summary_kwhours" row:

"The sum of power consumed (in kilowatt-hours) by the domain during the summary time period"

with:

"The sum of energy consumed (in kilowatt hours) by the domain during the summary time period"

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #772 PAS UK Issue #64#2 - Clarify Power/Energy Units

Description:

1 In Clause 10.1.2, Table 63, replace the description of the "cdmi_summary_kwmin" row:

"The minimum power consumed (in kilowatt-hours) by the domain during the summary time period"

with:

"The minimum rate at which energy is consumed (in kilowatt hours per hour) by the domain during the summary time period"

2 In Clause 10.1.2, Table 63, replace the description of the "cdmi_summary_kwmax" row:

"The maximum power consumed (in kilowatt-hours) by the domain during the summary time period"

with:

"The maximum rate at which energy is consumed (in kilowatt hours per hour) by the domain during the summary time period"

3 In Clause 10.1.2, Table 63, replace the description of the "cdmi_summary_kwaverage" row:

"The average power consumed (in kilowatt-hours) by the domain during the summary time period"

with:

"The average rate at which energy is consumed (in kilowatt hours per hour) by the domain during the summary time period"

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #773 PAS UK Issue 66 - Clarify Member Enabled

Description:

In clause 10.1.3, Table 64 and Table 65, row "cdmi_member_enabled", replace:

"This field indicates if the member is enabled."

with:

"If true, this field indicates that requests associated with this domain member are allowed. If false, all requests performed by this domain member shall result in an HTTP status code of 403 Forbidden."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #775 PAS UK Issue #84 - Make C Language ACE Definition Generic

Description:

In clause 16.1.1, replace:

ACEs are composed of four fields. In C, their declaration would look like this:

```
/* * ACE structure */
typedef unsigned int typedef char*
uint_t; utf8str_t;
struct
};
cdmi_ace_t { uint_ttype; utf8str_t who; uint_tflags; uint_t
   access_mask;
```

While the type, flags, and access_mask are specified as unsigned integers, for efficiency, each defined bit in them has a corresponding string (in C, the label-pasted form of the macro), which may be used where desired for readability.

with:

ACEs are composed of four fields; type, who, flags and access_mask, as per RFC 3530. The type, flags, and access_mask shall be specified as either unsigned integers in hex string representation or as a comma-delimited list of bit mask string form values taken from Table 113, Table 115, and Table 116.

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #776 PAS UK Issue #86 - Constant Column

Description:

1 In clause 9.9.9, Example 2 Response, change:

```
"acetype": "CDMI_ACE_ACCESS_ALLOWED_TYPE",
"identifier": "OWNER@",
"aceflags": "CDMI_ACE_FLAGS_NONE",
"acemask": "CDMI_ACE_ALL"
```

to

```
"acetype": "ALLOW",
"identifier": "OWNER@",
"aceflags": "NO_FLAGS",
```

```
"acemask": "ALL_PERMS"
```

2 In clause 16.1.5, Table 116, "SYNCHRONIZE" row, replace the Bit Mask value:

```
"0x0010000"
```

with

```
"0x00100000"
```

3 In clause 16.1.8, replace:

"The complete textual representation is then all the selected strings concatenated with " | " between them, e.g., "ALL_PERMS | WRITE_OWNER". The strings should appear in the order they are selected."

with

"The complete textual representation is then all the selected strings concatenated with ", " between them, e.g., "ALL_PERMS, WRITE_OWNER". The strings should appear in the order they are selected.

4 In clause 16.1.6, replace:

"As ACLs are metadata, they are stored and retrieved through the metadata field included in a PUT or GET request. The syntax is as follows:"

with

"As ACLs are storage system metadata, they are stored and retrieved through the metadata field included in a PUT or GET request. The syntax is as follows, using the constant strings from Table 113, Table 115, and Table 116, above."

5 In clause 16.1.7, replace:

```
0x1007FFFF
evaluates to 0x1007FFFF == CDMI_ACE_ALL
```

with

```
0x001F07FF
evaluates to 0x001F07FF == "ALL_PERMS"
```

6 In clause 16.1.8, replace:

```
0x1007FFFF "ALL_PERMS""ALL_PERMS"
```

with

```
0x001F07FF ALL_PERMS""ALL_PERMS"
```

Also correct the text after the second paragraph to be arranged in three columns.

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #777 PAS UK Issue #87 - Fix Shall/Can

Description:

In clause 16.1.6, first paragraph, replace:

"When evaluating whether access to a particular object O by a principal P shall be granted, the server traverses the object's logical ACL (its ACL after processing inheritance from ancestor containers) in list order, using a temporary permissions bitmask m, initially empty (all zeroes)."

with

"When evaluating whether access to a particular object O by a principal P is to be granted, the server shall traverse the object's logical ACL (its ACL after processing inheritance from parent containers) in list order, using a temporary permissions bitmask m, initially empty (all zeroes)."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #778 PAS UK Issue #88 - Remove ACE timestamp

Description:

1 In clause 16.1.6, remove:

— If the ACL timestamp is nonexistent or is older than that of some parent (see foregoing discussion in previous subclause), use get_acl(O, P) to set the physical ACL equal to the logical ACL."

2 In clause 16.1.6 BNF, replace:

```
"ACE = { acetype , identifier , aceflags , acemask , acetime }"
```

with

```
"ACE = { acetype , identifier , aceflags , acemask }"
```

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #779 PAS UK Issue #75 - Emphasize Capabilities and Requirements

Description:

1 In clause 5.7, replace:

"Finally, capabilities allow a client to discover the capabilities of a CDMI implementation."

with

"Finally, capabilities allow a client to discover the capabilities of a CDMI implementation. Requirements throughout this international standard shall be understood in the context of CDMI capabilities. Mandatory requirements on functionality that is conditioned on a CDMI capability shall not be interpreted to require implementation of that capability, but rather shall be interpreted to apply only to implementations that support the functionality required by that capability.

For example, in 5.10, this international standard states, "Every cloud storage system shall allow object ID-based access to stored objects". This requirement must be understood in the context that access by object ID is predicated on the presence of the "cdmi_object_access_by_ID" capability.

2 In clause 12.1, remove paragraph:

"Requirements throughout this international standard shall be understood in the context of CDMI capabilities. Mandatory requirements on functionality that is conditioned on a CDMI capability shall not be interpreted to require implementation of that capability, but rather shall be interpreted to apply only to implementations that support the functionality required by that capability."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #780 PAS UK Issue #81 - Clarify OCCI Export

Description:

1 In clause 13.5, add to the end of the clause:

"For more detail on the use of the OCCI export protocol structure attributes, see 13.1. Because the actual networking and access control is under the control of a hidden, common infrastructure implementing both OCCI and CDMI, the normal permission structure shall not be provided."

2 In clause 13.6, replace:

— The list of who may access is a list of OCCI VM IDs.

with

— A JSON array of URIs to OCCI compute resources shall have access (permissions) to the exported container.

3 In clause 13.6, replace the example with:

```
"OCCI/iSCSI": {
    "identifier": "00007E7F00104BE66AB53A9572F9F51E",
    "permissions": [
        "http://example.com/compute/0/",
        "http://example.com/compute/1/"
    ]
}
```

CHANGES Made the specified changes to Version 1.0.2a.

Consolidated changes

1 In clause 13.6, add to the end of the clause:

"For more detail on the use of the OCCI export protocol structure attributes, see the Overview section 13.1. Because the actual networking and access control is under the control of a hidden, common infrastructure implementing both OCCI and CDMI, the normal permission structure shall not be provided."

2 Add the following sentence to the end of the first paragraph of 13.2:

old:

The export of a container, via data path protocols other than CDMI, is accomplished by creating or updating a container and supplying one or more export protocol structures, one for each such protocol. In this international standard, all such protocols are referred to as foreign protocols.

New:

The export of a container, via data path protocols other than CDMI, is accomplished by creating or updating a container and supplying one or more export protocol structures, one for each such protocol. In this international standard, all such protocols are referred to as foreign protocols. The implementation of foreign protocols shall be indicated by "true" values for system wide capabilities in 12.1.1 that shall always begin with "cdmi_export_".

3 In clause 9.2.9, first example, replace:

```
"OCCI/iSCSI" : {
        "identifier" : "0000706D0010B84FAD185C425D8B537E",
        "permissions" : "00007E7F00104EB781F900791C70106C"
},
```

with

```
"OCCI/iSCSI": {
        "identifier": "00007E7F00104BE66AB53A9572F9F51E",
        "permissions": [
            "http://example.com/compute/0/",
            "http://example.com/compute/1/"
        ]
    },
```

4 In clause 9.4.8, first example, replace:

```
"OCCI/iSCSI" : {
        "identifier" : "0000706D0010B84FAD185C425D8B537E",
        "permissions" : "00007E7F00104EB781F900791C70106C"
},
```

with

```
"OCCI/iSCSI": {
        "identifier": "00007E7F00104BE66AB53A9572F9F51E",
        "permissions": [
            "http://example.com/compute/0/",
            "http://example.com/compute/1/"
        ]
    },
```

5 In clause 9.6.9, first example, replace:

```
"OCCI/iSCSI" : {
        "identifier" : "0000706D0010B84FAD185C425D8B537E",
        "permissions" : "00007E7F00104EB781F900791C70106C"
},
```

with

```
"OCCI/iSCSI": {
        "identifier": "00007E7F00104BE66AB53A9572F9F51E",
        "permissions": [
            "http://example.com/compute/0/",
            "http://example.com/compute/1/"
        ]
    },
```

6 In clause 15.3.2, first example, replace:

```
"OCCI/iSCSI" : {
        "identifier" : "0000706D0010B84FAD185C425D8B537E",
        "permissions" : "00007E7F00104EB781F900791C70106C"
},
```

with

```
"OCCI/iSCSI": {
        "identifier": "00007E7F00104BE66AB53A9572F9F51E",
        "permissions": [
            "http://example.com/compute/0/",
            "http://example.com/compute/1/"
        ]
    },
```

7 In Clause 12.1.5, Table 109, replace the following rows:

cdmi_cifs_export
JSON String
If present and "true", the container can be exported as a filesystem via CIFS

cdmi_nfs_export
JSON String
If present and "true", the container can be exported as a filesystem via NFS

cdmi_iscsi_export
JSON String
If present and "true", the container can be exported as a filesystem via iSCSI

cdmi_occi_export
JSON String
If present and "true", the container can be exported as a filesystem via OCCI

with

cdmi_export_container_cifs
JSON String
If present and "true", the container can be exported as a filesystem via CIFS.

cdmi_export_container_nfs
JSON String
If present and "true", the container can be exported as a filesystem via NFS.

cdmi_export_container_iscsi
JSON String
If present and "true", the container can be exported as a LUN via iSCSI.

cdmi_export_container_occi_iscsi
JSON String
If present and "true", the container can be exported as a LUN via iSCSI to an OCCI initiator.

cdmi_export_container_webdav
JSON String
If present and "true", the container can be exported as a filesystem via Web-DAV.

8 In clause 5.15, replace:

5.15 Backwards Compatibility: Value Transfer Encoding

CDMI version 1.0.1 introduces the concept of value transfer encoding to enable the storage and retrieval of arbitrary binary data via CDMI content-type operations. Data objects created by CDMI 1.0 clients through CDMI content-type operations shall have a value transfer encoding of "utf-8", and data objects created through non-CDMI content-type operations shall have a value transfer encoding of "base64".

Data objects with a value transfer encoding of base 64 shall not have their value field accessible to CDMI 1.0 clients through CDMI content-type operations. Attempts to read the value of these objects shall return an empty value field ("") to these clients. CDMI 1.0 clients can detect this condition when the cdmi_size metadata is not 0 and the value field is empty.

with

5.15 Backwards Compatibility

5.15.1 Value Transfer Encoding

CDMI version 1.0.1 introduces the concept of value transfer encoding to enable the storage and retrieval of arbitrary binary data via CDMI content-type operations. Data objects created by CDMI 1.0 clients through CDMI content-type operations shall have a value transfer encoding of "utf-8", and data objects created through non-CDMI content-type operations shall have a value transfer encoding of "base64".

Data objects with a value transfer encoding of base 64 shall not have their value field accessible to CDMI 1.0 clients through CDMI content-type operations. Attempts to read the value of these objects shall return an empty value field ("") to these clients. CDMI 1.0 clients can detect this condition when the cdmi_size metadata is not 0 and the value field is empty.

5.15.2 Container Export Capabilities

CDMI version 1.0.2 normalizes the names of capabilities used by a client to discover if a container can be exported via various protocols, and deprecates the following container export capability names:

— cdmi_cifs_export,
— cdmi_nfs_export,

— cdmi_iscsi_export, and

— cdmi_occi_export.

9 In all places in the specification (examples, request headers, response headers) where we have "X-CDMI-Specification-Version: 1.0.1", we should update this to "X-CDMI-Specification-Version: 1.0.2".

CHANGES Made the specified changes to Version 1.0.2b and 1.1c.

Trac Ticket #781 PAS UK Issue #93 - Hold and Retention

Description:

1 In clause 17.4, bulleted list, replace:

— "Releases from hold are performed out of band or by vendor extension and are not part of the CDMI standard."

with

— "Releases from hold are not part of the CDMI standard and are typically performed out of band using an additionally secured non-CDMI mechanism provided by the implementation."

2 In clause 17.3, diagram, Figure 10, replace:

"Changes are not allowed; deletion is allowed"

with

"Changes and deletion are allowed"

3 In clause 17.4, Figure 11, replace:

"Changes and deletion of object is allowed"

with

"Changes and deletion of object are allowed"

4 In clause 17.4, Figure 12, replace:

"Changes are not allowed; deletion is allowed"

with

"Changes and deletion are allowed"

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #782 PAS UK Issue #65 - A&A Model

Description:

In clause 10.1.3, replace:

"The domain membership capability provides information about and allows the specification of end users and groups of users that are allowed to access the domain via CDMI and other access protocols. The concept of domain membership is not intended to replace or supplant ACLs, (see 16.1), but rather to provide a single, unified place to map identities and credentials to principals used by ACLs within the context of a domain. It also provides a place for authentication mappings to external authentication providers, such as LDAP and AD, to be specified."

with

"The domain membership capability provides information about, and allows the specification of, end users and groups of users that are allowed to access the domain via CDMI and other access protocols. The concept of domain membership is not intended to replace or supplant ACLs (see 16.1), but rather to provide a single, unified place to map identities and credentials to principals used by ACLs within the context of a domain (see model described in 10.1.4). It also provides a place for authentication mappings to external authentication providers, such as LDAP and AD, to be specified."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #783

PAS UK Issue #67 - Delete

Description:

In Clause 10.5.1, replace:

"The following HTTP DELETE deletes an existing domain and all contained children domains under the specified URI."

with

"To delete an existing domain object and transfer all objects associated with that domain to another domain (to preserve access), the following request shall be performed."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #784

PAS UK Issue #84 - New Queue Values

Description:

In Clause 11.2.1, add the following sentence to the end of the clause:

"The newly created queue shall have no values unless the queue is created as a result of copying or moving a source queue that has values or as a result of deserializing a serialized queue that has values."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #785 PAS UK Issue #69 - Clarify Default Queue Retrieval

Description:

In Clause 11.3.1, add to the end of the clause:

"Reading a queue object shall, by default, return the complete value of the oldest item in the queue, unless the queueValues range is empty."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #786 PAS UK Issue #70 - Clarify that update does not enqueue

Description:

In clause 11.4.1, replace:

"The following HTTP PUT updates an existing queue object at the specified URI."

with

"To update an existing queue object (excluding the enqueueing of values), the following request shall be performed."

(original text is pre update to ticket #720)

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #787 PAS UK Issue #71 - Fix enqueue example description

Description:

In clause 11.6.8, in Example 5 replace:

"POST to the queue object URI two new values with base 64 transfer encoding:"

with

"POST to the queue object URI two new values, one with base 64 transfer encoding and one with utf-8 transfer encoding:"

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #788 PAS UK Issue #72 - Plural option when enqueuing

Description:

1 In Clause 11.6.4, Table 98, "mimetype" row, replace:

"MIME type of the data to be enqueued into the queue object."

with:

"MIME type(s) of the data value(s) to be enqueued into the queue object."

2 In Clause 11.6.4, Table 98, "valuetransferencoding" row, replace:

"The value transfer encoding used for the queue object value. Two value transfer encodings are defined:"

with:

"The value transfer encoding(s) used for the queue object value(s). Two value transfer encodings are defined:"

3 In Clause 11.6.4, Table 98, "value" row, replace:

"Data to be enqueued into the queue object."

with:

"Data value(s) to be enqueued into the queue object."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #789 PAS UK Issue #73 - Fix Queue Delete Synopsis

Description:

In Clause 11.7.1, replace:

"The following HTTP DELETE deletes the oldest enqueued value in an existing queue object at the specified URI."

with

"To delete one or more of the oldest enqueued values in an existing queue, the following request shall be performed."

(original text is before the update to ticket #720)

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #791 PAS UK Issue #74 - Clarify why ?value needed

Description:

1 In Clause 11.7.1, replace:

— "<count> is the number of values to be removed from the queue object. If more queue object entries are requested to be deleted than exist in the queue object, the count is considered equal to the number of entries in the queue object."

with

— "<count> is the number of values, starting from the oldest, to be removed from the queue object. If more queue object entries are requested to be deleted than exist in the queue object, the count shall be considered equal to the number of entries in the queue object."

2 In Clause 11.7.1, add to the end of the clause:

"The "?value" suffix at the end of the queue resource URI must be included to distinguish the deletion of the oldest value from the deletion of the queue object itself, as described in Clause 11.5 (which deletes all enqueued values)."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #792 PAS UK Issue #76 - Clarify capability name restrictions

Description:

In Clause 12.1, replace:

"The capabilities defined as part of this international standard are described later in Clause 12. Capabilities not listed in this standard shall not begin with the prefix "cdmi_", but are otherwise permitted so that cloud storage system implementors have the ability to extend the use of capabilities in ways that are outside the scope of this international standard."

with

"The capabilities defined as part of this international standard are described starting in 12.1.1 “Cloud Storage System-Wide Capabilities”. Vendor-defined capabilities not specified in this international standard shall not start with "cdmi_".

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #793 PAS UK Issue #77 - Fix forward reference for Data System Metadata

Description:

In Clause 12.1.3, replace:

"Table 104 defines the capabilities for data system metadata in a cloud storage system. These capabilities are found in the capabilities objects for domains, data objects, containers, and queues. See 16.3 for a description of these data system metadata items."

with

"Table 104 defines the capabilities for data system metadata in a cloud storage system. These capabilities are found in the capabilities objects for domains, data

objects, containers, and queues. See 16.4 (Table 118) for a description of the meaning of the corresponding data system metadata items."

CHANGES Made the specified changes to Version 1.0.2a.

Proposed changes to eliminate forward references to data system metadata:

1 In Clause 12.1.3, replace:

Table 107 defines the capabilities for data system metadata in a cloud storage system. These capabilities are found in the capabilities objects for domains, data objects, containers, and queues. See 16.4 (Table 121) for a description of the meaning of the corresponding data system metadata items.

with

Table 107 defines the capabilities that indicate which data system metadata items are supported for objects stored in a cloud storage system. These capabilities are found in the capabilities objects for domains, data objects, containers, and queues. See 16.4 (Table 121) for a description of the meaning of the corresponding data system metadata items.

2 In section 12.1.3, Table 107, replace the table contents with the following text:

— **Capability Name**

Type

Definition

— cdmi_assignedsize

JSON String

When the cloud storage system supports the cdmi_assignedsize data system metadata as defined in 16.4, the cdmi_assignedsize capability shall be present and set to the string value "true". When this capability is absent, or present and set to the string value "false", cdmi_assignedsize data system metadata shall not be used.

— cdmi_data_redundancy

JSON String

When the cloud storage system supports the cdmi_data_redundancy data system metadata as defined in 16.4, the cdmi_data_redundancy capability shall be present and set to a positive numeric string representing the maximum value that the server supports. When this capability is absent, or present and set to an empty string value "", cdmi_data_redundancy data system metadata shall not be used.

— cdmi_immediate_redundancy

JSON String

When the cloud storage system supports the cdmi_immediate_redundancy data system metadata as defined in 16.4, the cdmi_immediate_redundancy capability shall be present and set to a positive numeric string representing the

maximum value that the server supports. When this capability is absent, or present and set to an empty string value "", cdmi_immediate_redundancy data system metadata shall not be used.

— cdmi_infrastructure_redundancy

JSON String

When the cloud storage system supports the cdmi_infrastructure_redundancy data system metadata as defined in 16.4, the cdmi_infrastructure_redundancy capability shall be present and set to a positive numeric string representing the maximum value that the server supports. When this capability is absent, or present and set to an empty string value "", cdmi_infrastructure_redundancy data system metadata shall not be used.

— cdmi_data_dispersion

JSON String

When the cloud storage system supports the cdmi_data_dispersion data system metadata as defined in 16.4, the cdmi_data_dispersion capability shall be present and set to the string value "true". When this capability is absent, or present and set to the string value "false", cdmi_data_dispersion data system metadata shall not be used.

— cdmi_geographic_placement

JSON String

When the cloud storage system supports the cdmi_geographic_placement data system metadata as defined in 16.4, the cdmi_geographic_placement capability shall be present and set to the string value "true". When this capability is absent, or present and set to the string value "false", cdmi_geographic_placement data system metadata shall not be used.

— cdmi_data_retention

JSON String

When the cloud storage system supports both the cdmi_retention_id and cdmi_retention_period data system metadata as defined in 16.4, the cdmi_data_retention capability shall be present and set to the string value "true". When this capability is absent, or present and set to the string value "false", cdmi_retention_id and cdmi_retention_period data system metadata shall not be used.

— cdmi_data_autodelete

JSON String

When the cloud storage system supports the cdmi_data_autodelete data system metadata as defined in 16.4, the cdmi_data_autodelete capability shall be present and set to the string value "true". When this capability is absent, or present and set to the string value "false", cdmi_data_autodelete data system metadata shall not be used.

— cdmi_data_holds

JSON String

When the cloud storage system supports the cdmi_hold_id data system metadata as defined in 16.4, the cdmi_data_holds capability shall be present and set to the string value "true". When this capability is absent, or present and set to the string value "false", cdmi_data_holds data system metadata shall not be used.

When a cloud storage system supports holds for the purpose of making data immutable, the system-wide capability of cdmi_security_immutability specified in Table 105 of 12.1.1 shall be present and set to "true".

— cdmi_encryption

JSON Array

When the cloud storage system supports the cdmi_encryption data system metadata as defined in 16.4, the cdmi_encryption capability shall be present and set to one or more values described in the cdmi_encryption data system metadata section in 16.4. When this capability is absent, or present and is an empty JSON array, cdmi_encryption data system metadata shall not be used.

When a cloud storage system supports at-rest encryption, the system-wide capability of cdmi_security_encryption specified in Table 105 of 12.1.1 shall be present and set to "true".

— cdmi_value_hash

JSON Array

When the cloud storage system supports the cdmi_value_hash data system metadata as defined in 16.4, the cdmi_value_hash capability shall be present and set to one or more values described in the cdmi_value_hash data system metadata section in 16.4. When this capability is absent, or present and is an empty JSON array, cdmi_value_hash data system metadata shall not be used.

When a cloud storage system supports value hashing, the system-wide capability of cdmi_security_data_integrity specified in Table 105 of 12.1.1 shall be present and set to "true".

— cdmi_sanitization_method

JSON Array

When the cloud storage system supports the cdmi_sanitization_method data system metadata as defined in 16.4, the cdmi_sanitization_method capability shall be present and set to one or more values described in the cdmi_sanitization_method data system metadata section in 16.4. When this capability is absent, or present and is an empty JSON array, cdmi_sanitization_method data system metadata shall not be used.

When a cloud storage system supports sanitization, the system-wide capability of cdmi_security_sanitization specified in Table 105 of 12.1.1 shall be present and set to "true".

— cdmi_latency

JSON String

When the cloud storage system supports the cdmi_latency data system metadata as defined in 16.4, the cdmi_latency capability shall be present and set to the string value "true". When this capability is absent, or present and set to the string value "false", cdmi_latency data system metadata shall not be used.

— cdmi_throughput

JSON String

When the cloud storage system supports the cdmi_throughput data system metadata as defined in 16.4, the cdmi_throughput capability shall be present and set to the string value "true". When this capability is absent, or present and set to the string value "false", cdmi_throughput data system metadata shall not be used.

— cdmi_RPO

JSON String

When the cloud storage system supports the cdmi_RPO data system metadata as defined in 16.4, the cdmi_RPO capability shall be present and set to the string value "true". When this capability is absent, or present and set to the string value "false", cdmi_RPO data system metadata shall not be used.

— cdmi_RTO

JSON String

When the cloud storage system supports the cdmi_RTO data system metadata as defined in 16.4, the cdmi_RTO capability shall be present and set to the string value "true". When this capability is absent, or present and set to the string value "false", cdmi_RTO data system metadata shall not be used.

3 In section 16.4, Table 121, replace the table contents with the following text:

— Metadata Name

Type

Description

Requirement

— cdmi_assignedsize

JSON String

If this data system metadata item is present and set to a positive numeric string, it indicates that the client is specifying the size in bytes that is desired to be reported for a container object exported via other protocols (see 9.1.1). The system is not required to reserve this space and may thin-provision the requested space. Thus, the requested value may be greater than the actual storage space consumed. When this data system metadata item is absent, or is present and is not set to a positive numeric string, this data system metadata item shall not be used.

This data system metadata item is only applied against container objects and is not inherited by child objects.

Optional

— cdmi_data_redundancy

JSON String

If this data system metadata item is present and set to a positive numeric string, it indicates that the client is requesting a desired number of complete copies. Additional copies may be made to satisfy demand for the value. When this data system metadata item is absent, or is present and is not set to a positive numeric string, this data system metadata item shall not be used.

Optional

— cdmi_immediate_redundancy

JSON String

If this data system metadata item is present and set to "true", it indicates that the client is requesting that at least the number of copies indicated in cdmi_data_redundancy contain the newly written value before the operation completes. This metadata is used to make sure that multiple copies of the data are written to permanent storage to prevent possible data loss. When this data system metadata item is absent, or is present and is not set to "true", this data system metadata item shall not be used.

If the requested number of copies cannot be created within the HTTP timeout period, the transaction shall complete, but the cdmi_immediate_redundancy_provided data system metadata shall be set to "false".

Optional

— cdmi_infrastructure_redundancy

JSON String

If this data system metadata item is present and set to a positive numeric string, it indicates that the client is requesting a desired number of independent storage infrastructures supporting the multiple copies of data. This metadata is used to convey that, of the copies specified in cdmi_data_redundancy, these copies shall be stored on this many separate infrastructures. When this data system metadata item is absent, or is present and is not set to a positive numeric string, this data system metadata item shall not be used.

Optional

— cdmi_data_dispersion

JSON String

If this data system metadata item is present and set to a positive numeric string, it indicates that the client is requesting a minimum desired distance (in km) between the infrastructures supporting the multiple copies of data. This metadata is used to separate the (cdmi_infrastructure_redundancy number of) infrastructures by a minimum geographic distance to prevent data loss due to site disasters. When this data system metadata item is absent, or is present

and is not set to a positive numeric string, this data system metadata item shall not be used.

Optional

— cdmi_geographic_placement

JSON Array of JSON Strings

If this data system metadata item is present and set to zero or more geopolitical identifiers, it indicates that the client is requesting restrictions on the geographic regions where the object is permitted to be stored. Each geopolitical identifier shall be in the form of either a string containing a valid ISO 3166 country/country-subdivision code, which indicates that storage is permitted within that geopolitical region, or in the form of a string starting with the "!" character in front of a valid ISO 3166 country/country-subdivision code, which excludes that country/country-subdivision from the previous list of geopolitical regions.

The list is evaluated, in order, from left to right, with evaluation of each candidate storage location stopping when the candidate location is a permitted or prohibited region or is contained within a permitted or prohibited region. In addition to the ISO 3166 codes, "*" shall indicate all regions. If a candidate location does not match any of the entries in the list, the candidate location shall be considered to be prohibited.

When this data system metadata item is absent, this data system metadata item shall not be used.

When this data system metadata item is present and does not contain valid geopolitical identifiers, the create, update, or deserialize operation shall fail with an HTTP status code of `400 Bad Request`.

When this data system metadata item is present and valid, but no available storage locations are permitted, the create, update, or deserialize operation shall fail with an HTTP status code of `403 Forbidden`.

Optional

— cdmi_retention_id

JSON String

If this data system metadata item is present and not an empty string, it indicates that the client is requesting that the string be used to tag a given object as being managed by a specific retention policy. This data system metadata item is not required to place an object under retention, but is useful when needing to be able to perform a query to find all objects under a specific retention policy. When this data system metadata item is absent, or is present and an empty string, this data system metadata item shall not be used.

Optional

— cdmi_retention_period

JSON String

If this data system metadata item is present and contains a valid ISO 8601:2004 time interval (as described in 5.14), it indicates that the client is requesting that an object be placed under retention (see 17.3). When this data system metadata item is absent, this data system metadata item shall not be used. When this data system metadata item is present but does not contain a valid ISO 8601:2004 time interval, the create, update, or deserialize operation shall fail with an HTTP status code of `400 Bad Request`.

If this data system metadata item is updated, and the new end date is before the current end date, the update operation shall fail with an HTTP status code of `403 Forbidden`.

Optional

— cdmi_retention_autodelete

JSON String

If this data system metadata item is present and set to "true", it indicates that the client is requesting that an object under retention be automatically deleted when retention expires. When this data system metadata item is absent, or is present and is not set to "true", this data system metadata item shall not be used.

Optional

— cdmi_hold_id

JSON Array of JSON Strings

If this data system metadata item is present and not an empty array, it indicates that the client is requesting that an object be placed under hold (see 17.4). Each string in the array shall contain a unique user-specified hold identifier.

When this data system metadata item is absent, or is present and is an empty JSON array, this data system metadata item shall not be used.

If this data system metadata item is updated, and a previously existing hold string has been removed or changed in the update, the update operation shall fail with an HTTP status code of `403 Forbidden`. (See 17.4 concerning releasing holds.)

Optional

— cdmi_encryption

JSON String

If this data system metadata item is present and not an empty string, it indicates that the client is requesting that the object be encrypted while at rest. If encrypted, all data and metadata related to the object shall be encrypted. Supported algorithm/mode/length values are provided by the cdmi_encryption capability.

When this data system metadata item is absent, this data system metadata item shall not be used.

If this data system metadata item is present but does not contain a valid encryption algorithm/mode/length string, the system is free to choose to ignore the data system metadata, to fail with an HTTP status code of `400 Bad Request`, or to select an encryption algorithm/mode/length of the system's choice.

Supported encryption algorithms are expressed as a string in the form of ALGORITHM_MODE_KEYLENGTH, where:

• "ALGORITHM" is the encryption algorithm (e.g., "AES" or "3DES").

• "MODE" is the mode of operation (e.g., "XTS", "CBC", or "CTR").

• "KEYLENGTH" is the key size in bytes (e.g., "128", "192", "256").

To improve interoperability between CDMI implementations, the following designators should be used for the more common encryption combinations:

• "3DES_ECB_168" for the three-key TripleDES algorithm, the Electronic Code Book (ECB) mode of operation, and a key size of 168 bits;

• "3DES_CBC_168" for the three-key TripleDES algorithm, the Cipher Block Chaining (CBC) mode of operation, and a key size of 168 bits;

• "AES_CBC_128" for the AES algorithm, the CBC mode of operation, and a key size of 128 bits;

• "AES_CBC_256" for the AES algorithm, the CBC mode of operation, and a key size of 256 bits;

• "AES_XTS_128" for the AES algorithm, the XTS mode of operation, and a key size of 128 bits; and

• "AES_XTS_256" for the AES algorithm, the XTS mode of operation, and a key size of 256 bits.

Optional

— cdmi_value_hash

JSON String

If this data system metadata item is present and not an empty string, it indicates that the client is requesting that the system hash the object value using the hashing algorithm and length requested. The result of the hash shall be provided in the cdmi_hash storage system metadata item. Supported algorithm/length values are provided by the cdmi_value_hash capability.

When this data system metadata item is absent, this data system metadata item shall not be used.

If this data system metadata item is present but does not contain a valid hash algorithm/length string, the system is free to choose to ignore the data system metadata, to fail with an HTTP status code of `400 Bad Request`, or to select a hash algorithm/length of the system's choice.

Supported hash algorithms are expressed as a string in the form of ALGORITHM LENGTH, where:

• "ALGORITHM" is the hash algorithm (e.g., "SHA").

• "LENGTH" is the hash size in bytes (e.g., "160", "256").

To improve interoperability between CDMI implementations, the following designators should be used for the more common encryption combinations:

• "SHA160" for SHA-1, and

• "SHA256" for SHA-2.

Optional

— cdmi_sanitization_method

JSON String

If this data system metadata item is present and not an empty string, it indicates that the client is requesting that the system use a specific sanitization method to delete data such that the data is unrecoverable after an update or delete operation. Supported sanitization method values are provided by the cdmi_sanitization_method capability.

When this data system metadata item is absent, this data system metadata item shall not be used.

If this data system metadata item is present but does not contain a valid sanitization method string, the system is free to choose to ignore the data system metadata, to fail with an HTTP status code of `400 Bad Request`, or to select a sanitization method of the system's choice.

Supported sanitization methods are defined as system-specific strings.

Optional

— cdmi_latency

JSON String

If this data system metadata item is present and set to a positive numeric string, it indicates that the client is requesting a desired maximum time to first byte, in milliseconds. This metadata is the desired latency (in milliseconds) to the first byte of data, as measured from the edge of the cloud and factoring out any propagation latency between the client and the cloud. For example, this metadata may be used to determine, in an interoperable way, from what type of storage medium the data may be served. When this data system metadata item is absent, or is present and is not set to a positive numeric string, this data system metadata item shall not be used.

Optional

— cdmi_throughput

JSON String

If this data system metadata item is present and set to a positive numeric string, it indicates that the client is requesting a desired maximum data rate on retrieve, in bytes per second. This metadata is the desired bandwidth to the data, as measured from the edge of the cloud and factoring out any bandwidth

capability between the client and the cloud. This metadata is used to stage the data in locations where there is sufficient bandwidth to accommodate a maximum usage. When this data system metadata item is absent, or is present and is not set to a positive numeric string, this data system metadata item shall not be used.

Optional

— cdmi_RPO

JSON String

If this data system metadata item is present and set to a positive numeric string, it indicates that the client is requesting a largest acceptable duration in time between an update or create and when the object may be recovered, specified in seconds. This metadata is used to indicate the desired backup frequency from the primary copy or copies of the data to the secondary copy or copies. It is the maximum acceptable time period before a failure or disaster during which changes to data may be lost as a consequence of recovery. When this data system metadata item is absent, or is present and is not set to a positive numeric string, this data system metadata item shall not be used.

Optional

— cdmi_RTO

JSON String

If this data system metadata item is present and set to a positive numeric string, it indicates that the client is requesting the largest acceptable duration in time to restore data, specified in seconds. This metadata is used to indicate the desired maximum acceptable duration to restore the primary copy or copies of the data from a secondary backup copy or copies. When this data system metadata item is absent, or is present and is not set to a positive numeric string, this data system metadata item shall not be used.

Optional

CHANGES Made the specified changes to Version 1.0.2b and 1.1c.

Trac Ticket #794 PAS UK Issue #79 - Change bullets to numbered list

Description:

In Clause 13.2.1, change the first bulleted list (with four items) into a numbered list.

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #795 PAS UK Issue #95 - Logging not standardized

Description:

In Clause 20.1, add to end of clause:

"CDMI does not define the format of log messages. It is anticipated that future logging standards will address this area."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #796 PAS UK Issue #98 - Fix typo (Logging vs. Notification)

Description:

In Clause 21, replace:

"Notification queues allow CDMI clients to efficiently discover what changes have occurred to the system. As queue data is persistent, no session state needs to be retained by the client. If different logging queues are used for different clients, then each client operates independently from the others (e.g., a storage management application may use a notification queue to keep its database current without having to do full scans of a container to discover what data objects have been added, modified, or removed)."

with

"Notification queues allow CDMI clients to efficiently discover what changes have occurred to the system. As queue data is persistent, no session state needs to be retained by the client. If different notification queues are used for different clients, then each client operates independently from the others (e.g., a storage management application may use a notification queue to keep its database current without having to do full scans of a container to discover what data objects have been added, modified, or removed)."

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #797 PAS UK Issue #2 -Object Model Diagram

Description:

In Clause 5.8, replace the diagram with the attached UML Entities Interactions diagram. (See attached Visio source file)

Attachments: 2012-04-10 CDMI UML Entities Diagram.vs

CHANGES Made the specified changes to Version 1.0.2a.

Trac Ticket #799 PAS UK Issue #41 - State that all fields in table returned

Description:

Based on the preliminary discussions with the UK reviewer, additional changes need to be made for this issue. Specifically, we need to clarify that all fields in the response message body are returned unless limited by the "?" operators. We should apply this change to all places where there is a response message body.

All synopsis statements should be updated to use normative language, e.g.,

> "The following HTTP GET reads all fields from an existing data object at the specified URI."
>
> to
>
> "To read all fields from an existing data object at a specified URI, the following request shall be performed."

etc. to make all statements consistent.

Consolidated changes for Marie based on the 606 document:

Clause 8

1 In clause 8.3.1, replace:

The following HTTP PUT creates a new data object at the specified URI.

```
PUT <root URI>/<ContainerName>/<DataObjectName>
```

with

To create a new data object, the following request shall be performed:

```
PUT <root URI>/<ContainerName>/<DataObjectName>
```

2 In clause 8.4.1, replace:

The following HTTP GET reads from an existing data object at the specified URI.

```
GET <root URI>/<ContainerName>/<DataObjectName>
GET <root URI>/<ContainerName>/
   <DataObjectName>?<fieldname>;<fieldname>;...
GET <root URI>/<ContainerName>/<DataObjectName>?value:<range>;...
GET <root URI>/<ContainerName>/
   <DataObjectName>?metadata:<prefix>;...
```

with

To read all fields from an existing data object, the following request shall be performed:

```
GET <root URI>/<ContainerName>/<DataObjectName>
```

To read one or more requested fields from an existing data object, one of the following requests shall be performed:

```
GET <root URI>/<ContainerName>/
   <DataObjectName>?<fieldname>;<fieldname>;...
GET <root URI>/<ContainerName>/<DataObjectName>?value:<range>;...
```

```
GET <root URI>/<ContainerName>/
   <DataObjectName>?metadata:<prefix>;...
```

3 In clause 8.5.1, replace:

The following HTTP GET reads from an existing data object at the specified URI.

```
GET <root URI>/<ContainerName>/<DataObjectName>
```

with

To read the value of an existing data object, the following request shall be performed:

```
GET <root URI>/<ContainerName>/<DataObjectName>
```

4 In clause 8.6.1, replace:

The following HTTP PUT updates an existing data object at the specified URI

```
PUT <root URI>/<ContainerName>/<DataObjectName>
PUT <root URI>/<ContainerName>/<DataObjectName>?value:<range>
PUT <root URI>/<ContainerName>/
   <DataObjectName>?metadata:<metadataname>;....
```

with

To update some or all fields in an existing data object, the following request shall be performed:

```
PUT <root URI>/<ContainerName>/<DataObjectName>
```

To update the value of an existing data object, the following request shall be performed:

```
PUT <root URI>/<ContainerName>/<DataObjectName>?value:<range>
```

To add, update, and remove specific metadata items of an existing data object, the following request shall be performed:

```
PUT <root URI>/<ContainerName>/
   <DataObjectName>?metadata:<metadataname>;...
```

Note: Remove the extra "." at the end of the last PUT synopsis.

5 In clause 8.7.1, replace:

The following HTTP PUT updates an existing data object at the specified URI

```
PUT <root URI>/<ContainerName>/<DataObjectName>.
```

with

To update the value of an existing data object, the following request shall be performed:

```
PUT <root URI>/<ContainerName>/<DataObjectName>
```

Note: Remove the extra "." at the end of the last PUT synopsis.

6 In clause 8.8.1, replace:

The following HTTP DELETE deletes an existing data object at the specified URI.

```
DELETE <root URI>/<ContainerName>/<DataObjectName>
```

with

To delete an existing data object, the following request shall be performed:

```
DELETE <root URI>/<ContainerName>/<DataObjectName>
```

7 In clause 8.9.1, replace:

The following HTTP DELETE deletes an existing data object at the specified URI.

```
DELETE <root URI>/<ContainerName>/<DataObjectName>
```

with

To delete an existing data object, the following request shall be performed:

```
DELETE <root URI>/<ContainerName>/<DataObjectName>
```

Clause 9

1 In clause 9.2.1, replace:

The following HTTP PUT creates a new container object at the specified URI.

```
PUT <root URI>/<ContainerName>/<NewContainerName>/
```

with

To create a new container object, the following request shall be performed:

```
PUT <root URI>/<ContainerName>/<NewContainerName>/
```

2 In clause 9.3.1, replace:

The following HTTP PUT creates a new container object at the specified URI.

```
PUT <root URI>/<ContainerName>/<NewContainerName>/
```

with

To create a new container object, the following request shall be performed:

```
PUT <root URI>/<ContainerName>/<NewContainerName>/
```

3 In clause 9.4.1, replace:

The following HTTP GET reads from an existing container object at the specified URI.

```
GET <root URI>/<ContainerName>/<TheContainerName>/
GET <root URI>/<ContainerName>/<TheContainerName>/
   ?<fieldname>;<fieldname>;...
GET <root URI>/<ContainerName>/<TheContainerName>/
   ?children:<range>;...
GET <root URI>/<ContainerName>/<TheContainerName>/
   ?metadata:<prefix>;...
```

with

To read all fields from an existing container object, the following request shall be performed:

```
GET <root URI>/<ContainerName>/<TheContainerName>/
```

To read one or more requested fields from an existing container object, one of the following requests shall be performed:

```
GET <root URI>/<ContainerName>/<TheContainerName>/
   ?<fieldname>;<fieldname>;...
GET <root URI>/<ContainerName>/<TheContainerName>/
   ?children:<range>;...
GET <root URI>/<ContainerName>/<TheContainerName>/
   ?metadata:<prefix>;...
```

4 Delete Clause 9.5.

5 In clause 9.6.1, replace:

The following HTTP PUT updates an existing container object at the specified URI.

```
PUT <root URI>/<ContainerName>/<TheContainerName>/
PUT <root URI>/<ContainerName>/<TheContainerName>/
   ?metadata:<metadataname>;...
```

with

To update some or all fields in an existing container object, the following request shall be performed:

```
PUT <root URI>/<ContainerName>/<TheContainerName>/
```

To add, update, and remove specific metadata items of an existing container object, the following request shall be performed:

```
PUT <root URI>/<ContainerName>/<TheContainerName>/
   ?metadata:<metadataname>;...
```

6 In clause 9.7.1, replace:

The following HTTP DELETE deletes an existing container object, all contained children, and snapshots at the specified URI.

```
DELETE <root URI>/<ContainerName>/<TheContainerName>/
```

with

To delete an existing container object, including all contained children and snapshots, the following request shall be performed:

DELETE <root URI>/<ContainerName>/<TheContainerName>/

7 In clause 9.8.1, replace:

The following HTTP DELETE deletes an existing container object, all contained children, and snapshots at the specified URI.

```
DELETE <root URI>/<ContainerName>/<TheContainerName>/
```

with

To delete an existing container object, including all contained children and snapshots, the following request shall be performed:

```
DELETE <root URI>/<ContainerName>/<TheContainerName>/
```

8 In clause 9.10.1, replace:

The following HTTP POST creates a new data object as a child of the specified container object URI.

```
POST <root URI>/<ContainerName>/
```

with

To create a new data object in a specified container where the name of the data object is a server-assigned object identifier, the following request shall be performed:

```
POST <root URI>/<ContainerName>/
```

Clause 10

1 In clause 10.2.1, replace:

The following HTTP PUT creates a new domain at the specified URI.

```
PUT <root URI>/cdmi_domains/<DomainName>/<NewDomainName>/
```

with

To create a new domain object, the following request shall be performed:

```
PUT <root URI>/cdmi_domains/<DomainName>/<NewDomainName>/
```

2 In clause 10.3.1, replace:

The following HTTP GET reads from an existing domain at the specified URI.

```
GET <root URI>/cdmi_domains/<DomainName>/<TheDomainName>/
GET <root URI>/cdmi_domains/<DomainName>/<TheDomainName>/
   ?<fieldname>;<fieldname>;...
GET <root URI>/cdmi_domains/<DomainName>/<TheDomainName>/
   ?children:<range>;...
GET <root URI>/cdmi_domains/<DomainName>/<TheDomainName>/
   ?metadata:<prefix>;...
```

with

To read all fields from an existing domain object, the following request shall be performed:

```
GET <root URI>/cdmi_domains/<DomainName>/<TheDomainName>/
```

To read one or more requested fields from an existing domain object, one of the following requests shall be performed:

```
GET <root URI>/cdmi_domains/<DomainName>/<TheDomainName>/
   ?<fieldname>;<fieldname>;...
GET <root URI>/cdmi_domains/<DomainName>/<TheDomainName>/
   ?children:<range>;...
GET <root URI>/cdmi_domains/<DomainName>/<TheDomainName>/
   ?metadata:<prefix>;...
```

3 In clause 10.4.1, replace:

The following HTTP PUT updates an existing domain at the specified URI.

```
PUT <root URI>/cdmi_domains/<DomainName>/<TheDomainName>/
PUT <root URI>/cdmi_domains/<DomainName>/<TheDomainName>/
   ?metadata:<metadataname>;...
```

with

To update some or all fields in an existing domain object, the following request shall be performed:

```
PUT <root URI>/cdmi_domains/<DomainName>/<TheDomainName>/
```

To add, update, and remove specific metadata items of an existing domain object, the following request shall be performed:

```
PUT <root URI>/cdmi_domains/<DomainName>/<TheDomainName>/
   ?metadata:<metadataname>;...
```

Clause 11

1 In clause 11.2.1, replace:

The following HTTP PUT creates a new queue object at the specified URI.

```
PUT <root URI>/<ContainerName>/<QueueName>
```

with

To create a new queue object, the following request shall be performed:

```
PUT <root URI>/<ContainerName>/<QueueName>
```

2 In clause 11.3.1, replace:

The following HTTP GET reads from an existing queue object at the specified URI.

```
GET <root URI>/<ContainerName>/<QueueName>
GET <root URI>/<ContainerName>/
   <QueueName>?<fieldname>;<fieldname>;...
GET <root URI>/<ContainerName>/<QueueName>?value:<range>;...
GET <root URI>/<ContainerName>/<QueueName>?metadata:<prefix>;...
GET <root URI>/<ContainerName>/<QueueName>?values:<count>
```

with

To read all fields from an existing queue object, the following request shall be performed:

```
GET <root URI>/<ContainerName>/<QueueName>
```

To read one or more requested fields from an existing queue object, one of the following requests shall be performed:

```
GET <root URI>/<ContainerName>/
   <QueueName>?<fieldname>;<fieldname>;...
GET <root URI>/<ContainerName>/<QueueName>?value:<range>;...
GET <root URI>/<ContainerName>/<QueueName>?metadata:<prefix>;...
```

To read one or more queue values from an existing queue object, the following request shall be performed:

```
GET <root URI>/<ContainerName>/<QueueName>?values:<count>
```

3 In clause 11.4.1, replace:

To update an existing queue object (excluding the enqueueing of values), the following request shall be performed.

```
PUT <root URI>/<ContainerName>/<QueueName>
PUT <root URI>/<ContainerName>/
   <QueueName>?metadata:<metadataname>;...
```

with

To update some or all fields in an existing queue object (excluding the enqueueing of values), the following request shall be performed:

```
PUT <root URI>/<ContainerName>/<QueueName>
```

To add, update, and remove specific metadata items of an existing queue object, the following request shall be performed:

```
PUT <root URI>/<ContainerName>/
   <QueueName>?metadata:<metadataname>;...
```

4 In clause 11.5.1, replace:

The following HTTP DELETE deletes an existing queue object and all enqueued values at the specified URI.

```
DELETE <root URI>/<ContainerName>/<QueueName>
```

with

To delete an existing queue object, along with all enqueued values, the following request shall be performed:

```
DELETE <root URI>/<ContainerName>/<QueueName>
```

5 In clause 11.6.1, replace:

The following HTTP POST enqueues a new data value in an existing qqueue object at the specified container URI.

```
POST <root URI>/<ContainerName>/<QueueName>
```

with

To enqueue one or more values into an existing queue object, the following request shall be performed:

```
POST <root URI>/<ContainerName>/<QueueName>
```

Clause 12

In clause 12.2.1, replace:

The following HTTP GET reads from an existing capability object at the specified URI.

```
GET <root URI>/cdmi_capabilities/<Capability>/<TheCapability>/
GET <root URI>/cdmi_capabilities/<Capability>/<TheCapability>/
   ?<fieldname>;<fieldname>
GET <root URI>/cdmi_capabilities/<Capability>/<TheCapability>/
   ?children:<range>
```

with

To read one or more requested fields from an existing capability object, the following request shall be performed:

```
GET <root URI>/cdmi_capabilities/<Capability>/<TheCapability>/
```

To read one or more requested fields from an existing capability object, one of the following requests shall be performed:

```
GET <root URI>/cdmi_capabilities/<Capability>/<TheCapability>/
   ?<fieldname>;<fieldname>
```

```
GET <root URI>/cdmi_capabilities/<Capability>/<TheCapability>/
   ?children:<range>
```

Clause 13

In clause 13.3, replace:

The following HTTP GET reads from an existing container at the specified URI.

```
GET <root URI>/<ContainerName>/<TheContainerName>/?exports
GET <root URI>/<ContainerName>/<TheContainerName>/
   ?exports:protocol=<protocol>,user=<user>,verbose="false"
```

with

To read all exports for an existing container object, the following request shall be performed:

```
GET <root URI>/<ContainerName>/<TheContainerName>/?exports
```

To read selected exports for an existing container object, the following request shall be performed:

```
GET <root URI>/<ContainerName>/<TheContainerName>/
   ?exports:protocol=<protocol>,user=<user>,verbose="false"
```

CHANGES Made the specified changes to Version 1.0.2b and 1.1c.

Trac Ticket #800 PAS UK Issue #53 - Clarify Snapshot URIs

Description:

Based on the preliminary discussions with the UK reviewer, additional changes need to be made for this issue.

Add text explaining URIs (if they are absolute or relative, or both)

1. Example URIs in diagram are missing trailing "/".
2. In Table 43 in 9.6.4, in the Description cell for the "snapshot" Field Name, change:

   Name of the snapshot to be taken.

   to:

   Name of the snapshot to be taken. This is not a URL, but rather the final component of the absolute URL where the snapshot will exist when the snapshot operation successfully completes.

CHANGES Made the specified changes to Version 1.0.2b and 1.1c.

Trac Ticket #805 Editorial changes (cont.) - Clauses 18 and 19

Description: Refer to markups in CDMI_Spec 1.1b.pdf.

Clause 18

1. Needs subclauses - suggest
   - Line 2 - Introduction
   - Line 32 - Examples
   - Line 82 - Query Matching Expressions
2. Line 9 - Change "will" to "shall"?
3. Line 11 - Change "this" to "this structure"
4. Line 81 - Remove space between Lines 81 and 82.
5. Table 123

   In the condition statements in some of the rows, should "the condition is considered to be met" be changed to "the condition shall be considered to be met"?
6. Change "for example" to "e.g." (for consistency).
7. Remove square brackets from [RFC4627] and create a cross-ref.
8. In "field" : "!starts constant" row, add space between 2nd and 3rd sentences.
9. In "field" : "contains constant" row, remove space between paragraphs.
10. In "field" : "=~ constant" and "field" : "!~ constant" rows, replace "The Open Group Base Specifications Issue 6, IEEE Std 1003.1, 2004 Edition" with a cross-ref.

Clause 19

1. Needs subclauses - suggest
   - Line 2 - Introduction
   - Line 29 - Examples
2. Lines 46-47 - Change to

   For most common use cases, clients request either the objectID, the objectName and parentURI, or all three fields in the cdmi_results_specification.
3. Line 48 - Change "container" to "container object".

TWG: All changes approved and are to be applied to 1.1 and 1.0.2.

CHANGES Made the specified changes to 1.1c and 1.0.2.

Trac Ticket #806

Editorial changes (cont.) - Clauses 20-22, Annex A

Description: Refer to 20-End CDMI-1.1b.PDF (attached) for markups and line numbers.

Clause 20

1. Line 7 - Change "CDMI" to "This international standard".
2. Line 10-13 - Propose rewrite to read,

   "A CDMI client may access log data by creating a logging queue that indicates the scope of log messages that the client wishes to receive, as described in 20.6. If

the user has sufficient permissions to create a logging queue, all log messages to which the user subscribes shall be enqueued into the queue, which the user may then access for processing and archival".

3 Line 14 - Change "each" to "each logging queue".

4 Line 36 and 37 - Remove quotes from metadata names.

5 Line 37 - Change "this" to "this metadata".

6 Line 39 - Add quotes to cdmi_security_audit, (since it's a capability name).

TWG: No quotes in any capability names.

7 Table 124 - cdmi_queue_type row: Delete quotes from "cdmi_logging_queue".

Clause 21

1 Line 28 and 29 - Fix font size of cdmi_queue_type.

2 Table 126 -

— cdmi_queue_type row: Delete quotes from "cdmi_notification_queue".

— cdmi_notification_events row:

Remove quotes from "processing".

Change "as part of "move" request message operation" to "part of a move operation".

Change "an container" to "a container".

Change "Notifications are generated when an container is snapshotted" to "Notifications are generated when a container snapshot is created".

3 Line 76 - Change to active voice - Change to "If the administrator created the notification queue, then all matching objects that the administrator is allowed to read are included in the results. If user "jdoe" created the notification queue,..."

4 Table 127 - Change "vendor defined text" to "vendor-defined text".

Clause 22

1 Line 23 - Change "will" to "shall".

2 Table 128 -

— cdmi_queue_type row: Remove quotes from "cdmi_query_queue".

— cdmi_scope_specification row: Change "This is equivalent" to "This scope specification is similar".

— cdmi_results_specification row:

Change "Contains" to "The results specification contains".

Change "This is equivalent" to "This results specification is similar".

3 Line 33 - Change to EXAMPLE style.

4 Line 54 - Remove hyphen from "MIME-type".

5 Line 57 - Change to EXAMPLE style.

6 Line 67 - Change to active voice - change to "If the administrator created the query queue, then all matching objects that the administrator is allowed to read are included in the results. If user "jdoe" created the query queue,...

7 Line 75 - Remove quotes from "cdmi_query_queue".

Annex A

1 Line 18 - Add comma after "entities".

2 Line 19 - Remove comma after "optional".

3 Line 36 - Change "timeout" to "time out".

4 Line 40, 42, et al. - Change "DER encoded X.509" and "Base64 encoded X.509" to "DER-encoded X.509" and "Base64-encoded X.509", respectively.

5 Line 63 - Change "Transport Security Layer (TLS)" to "TLS".

6 Line 91-93 - Change to

"Typically only the server is authenticated (i.e., its identity is ensured, while the client remains unauthenticated, which means the end users (whether individuals or applications) have a measure of assurance with whom they are communicating."

7 Line 138-139 - Change - "to always use TLS underneath HTTP authentication, and only accept " to "to always use TLS underneath HTTP authentication and to only accept "

8 Line 146 - Change "web sites" to "websites".

9 Line 170 - Add comma after "Ideally".

10 Line 173 - Change "Certificate Revocation List (CRL)" to "CRL".

11 Line 198 - Change "OCSP" to "Online Certificate Status Protocol (OCSP)".

12 Line 199 - Change "Certificate Authority" to "CA".

13 Line 233 - Change "This is considered the normal operating mode." to "This operating mode is considered commonplace.".

14 Line 233-237 - Fix formatting.

15 Line 239 - Change "certificate authority" to "CA".

16 Line 238-240 - Change to

"Interactive clients should provide a means to query the user about acceptance of a certificate from an unrecognized CA (where no corresponding CA root certificate is installed on the client) and to accept responses allowing the use of the certificate presented or the use of all certificates from the issuing CA."

17 Line 243 - Remove comma after optional.

Make all approved changes to 1.1; make the normative change (Clause 22, Item #1) to 1.0.2.

CHANGES Made all changes to 1.1c and one change (Item 1 of Clause 22) to 1.0.2.

Trac Ticket #816

Description field of scenario Read Domain object for value - objectname, parentID and parentName

Description:

Under section 10.3.6, there is a table of Response message body of Read domain object scenario, where there are 3 fields - objectName, parentID, and parentURI, which do not have a correct description.

The description fields of these values talk about objects that are not in containers (which are accessible by ID).

We understand that we cannot have domain object accessible by objectID only. It seems the description field of container object is wrong. Please correct it.

Proposed change: In 10.3.6 for these three fields, the bullets can be removed and the field "requirement" set to "Mandatory".

Recommend we fix this in 1.0.2 (and 1.1).

TWG: Change approved.

CHANGES Made all changes to 1.1c and 1.0.2.

Trac Ticket #817

newDomain field in request body of delete Domain object operation

Description: Under section 10.5.4, there is a table of request message body for delete Domain object scenario where there is a field newDomain. I checked RFS 2616, and I understand that we can't add request body in case of delete operation. If agreed with the above statement, how will we pass newDomain field in that case?

Response: Please cite the relevant section of 2616. My understanding is that it is silent as to if a request body is permitted for an HTTP DELETE.

I agree that our use of a request body is unusual, and we may want to consider a header for this purpose. I would recommend that this work be combined with the discussions (started at the last face-to-face meeting) to define a "delete domain and all owned data" function.

No change recommended for 1.0.2 as the reviewers did not highlight this as a problem area. Recommend retarget this for review as part of CDMI 1.1.

TWG: This was a UK comment, so we can make a change.

Another way to handle this is to add a metadata field to the domain that must be present before the deletion.

1 Add following row to the end of table 65 in clause 10.1.1:

cdmi_domain_delete_reassign

JSON String

If the domain is deleted, indicates to which domain the objects that belong to the domain shall be reassigned. To delete a domain that contains objects, this metadata item shall be present. If this metadata item is not present or does not contain the URI of a valid domain that is different from the the URI of the domain being deleted, an attempt to delete a domain that has objects shall result in an HTTP status code of 409 Conflict.

Conditional

2 In clause 10.5.3, in table 82, drop the "Content-Type" row.

3 In clause 10.5.4, replace the clause text with:

A request body may be provided as per RFC 2616.

4 In clause 10.5.7, in table 84, row "409", replace:

"The domain may not be deleted (may be immutable), or the specified newDomain URI is invalid or unusable."

with

"The domain cannot be deleted because there are objects belonging to the domain and cdmi_domain_delete_reassign is missing, invalid or unusable."

5 In clause 10.5.8, replace the example with:

```
DELETE /cdmi_domains/MyDomain/ HTTP/1.1
Host: cloud.example.com
X-CDMI-Specification-Version: 1.0.2
```

The following shows the response.

```
HTTP/1.1 204 No Content
```

CHANGES Made all changes to 1.1c and 1.0.2.

Trac Ticket #818

Description field of Read Capability object scenario for value - objectName, parentID and parentName

Description:

Under section 12.2.6, there is a table of Response message body of Read capability object scenario, where there are 3 fields - objectName, parentID, and parentURI, which do not have a correct description.

The description fields of these values talk about objects that are not in containers (which are accessible by ID).

We understand that we cannot have capability object accessible by objectID only. It seems the description field of container object is wrong. Please correct it.

Proposed change: In 12.2.6 for these three fields, the bullets can be removed and the field "requirement" set to "Mandatory".

Recommend we fix this in 1.0.2 (and 1.1).

TWG: Change approved.

CHANGES Made all changes to 1.1c and 1.0.2.

Trac Ticket #820 9.9.5/9.11.5 Domain URI Field

Description:

In clauses 9.9.5 and 9.11.5, in the request body, "domainURI" row, consider the existing text:

> URI of the owning domain
>
> — If different from the parent domain, the user shall have the "cross_domain" privilege (see cdmi_member_privileges in Table 67).
> — If not specified, the parent domain shall be used.
> — If creating an object by ID using /cdmi_objectid/, there is no parent container object, so the domain must be specified.

There are several problems with this text:

- There is no parent domain for nameless objects. Thus, the first two bullets are misleading at best.
- Any domain can be specified without the "cross_domain" privilege, because this priviledge defines if you can cross between domains. Without a parent, you can't cross domains - these objects float alone.
- For POST, there needs to be a "default" domain selected if no domain is specified. Why? Because no domain is specified in a non-CDMI POST. This is also consistent with this field being labeled as "optional".

My recommendation to deal with these issues is to change the text to:

> URI of the owning domain
>
> — Any domain may be specified, and the "cross_domain" privilege is not required (see cdmi_member_privileges in Table 67).
> — If not specified, the root domain "/cdmi_domains/" shall be used.

This can fit under the normative language change requests of the ISO reviewer.

TWG: Change approved.

CHANGES Made all changes to 1.1c and 1.0.2.

Trac Ticket #821 5.7 Line 153

Description:

Clause 5.7, line 153 should be changed from:

"based access to stored objects". This requirement must be understood in the context that access by object"

to

"based access to stored objects". This requirement shall be understood in the context that access by object"

This fits under the normative language change requests of the ISO reviewer.

CHANGES Made all changes to 1.1c and 1.0.2.

Trac Ticket #822

9.6.5 deserializevalue field

Description:

In clause 9.6.5, in the "deserializevalue" row of the request body table, the text:

"The object ID of the serialized container object must match the object ID of the destination container object."

should be changed to

"The object ID of the serialized container object shall match the object ID of the destination container object. Otherwise, the server shall return an HTTP status code of 400 Bad Request."

This fits under the normative language change requests of the ISO reviewer, and the request to indicate error conditions.

CHANGES Made all changes to 1.1c and 1.0.2.

Trac Ticket #823

10.1.3 cdmi_member_credentials Metadata Item

Description:

In clause 10.1.3, in the Domain Member User Objects table, "cdmi_members_credentials" metadata item, the text:

"If this field is not present, one or more delegations must be present and shall be used to resolve user credentials."

should be changed to:

"If this field is not present, one or more delegations shall be present and are used to resolve user credentials."

This fits under the normative language change requests of the ISO reviewer.

TWG: Use following sentence:

"If this field is not present, one or more delegations shall be present and shall be used to resolve user credentials."

CHANGES Made all changes to 1.1c and 1.0.2.

Trac Ticket #824 10.1.3 cdmi_member_principal Metadata item

Description:

User Objects table, "cdmi_member_principal" metadata item, the text:

"If this field is not present, one or more delegations must be present and shall be used to resolve the principal."

should be changed to:

"If this field is not present, one or more delegations shall be are used to resolve the principal."

This fits under the normative language change requests of the ISO reviewer.

TWG: Change to the following sentence:

"If this field is not present, one or more delegations shall be present and shall be used to resolve the principal."

CHANGES Made all changes to 1.1c and 1.0.2.

Trac Ticket #825 11.7.1 Line 504

Description:

Clause 11.7.1, line 504 should be changed from:

"The "?value" suffix at the end of the queue resource URI must be included to distinguish the deletion of the"

to

"The "?value" suffix at the end of the queue resource URI shall be included to distinguish the deletion of the"

This fits under the normative language change requests of the ISO reviewer.

CHANGES Made all changes to 1.1c and 1.0.2.

Trac Ticket #826 12.2.1 Lines 72/73

Description:

Clause 12.2.1, Lines 72 and 73 should be changed from:

> "To read one or more requested fields from an existing capability object, the following request shall be performed:"
>
> to
>
> "To read all fields from an existing capability object, the following request shall be performed:

This was an error applying a previously approved ticket. I have verified that this is the only place this occurred.

CHANGES Made all changes to 1.1c and 1.0.2.

Trac Ticket #827 Misc 1.0.2 Review Tickets from Alex

Description: (The initial numbers refer to page number and line number, respectively of CDMI 1.0.2b.)

1 33 217 The 5th byte shall contain the full length of the object ID, in bytes.

"The byte at offset 5 shall..." as the 5th byte is numbered 4.

DS Note: Recommend that we make this change.

TWG: Change approved.

2 41 5 Table 6 - HTTP Status Codes

403 Forbidden The client lacks the proper auathorization to perform this request.

Spelling; "authorization"

DS Note: Recommend that we make this change.

TWG: Change approved.

3 41 5 Table 6 - HTTP Status Codes

406 Not Acceptable No content type may be produced at this URI that matches the request.

The above is ambiguous and refers to "content type"; should it read " No content can be produced at this URI that matches the request."?

DS Note: Recommend that we make this change.

TWG: Change approved.

4 41 15 To continue, when CDMI clients receive a 302 Found redirect, they should retry the operation using the URI contained within the Location header.

1. Is there any limit to the number of times the client can retry this operation? In other words, can a redirect return a redirect, and how do we protect against circular redirects?

2. How does the returned URI differ, as "location" is not well defined? Does it mean "different DNS"?

3. If I request non-OID http://cloud.somewhereelse.com/root/MyDataObject.txt can I get an OID return 302 Found Location: http://cloud.example.com/root/cdmi_objectid/00006FFD001001CCE3B2B4F602032653 ?

4. What trust does the client have in the server during a redirect (for instance, how do we protect against malicious redirects)?

DS Notes:

1. This would be as per RFC 2616.

2. The location header, in the context of a redirect, is well-defined in RFC 2616.

3. That would be allowable.

4. If the server is malicious, the client is in trouble. No different from a standard HTTP server.

Recommend no changes here.

TWG: Recommend that we address concerns around redirects related to federations in 1.1. No changes for 1.0.2.

5 41 17 To change to where a reference redirects a client, the reference shall first be deleted then re-created.

(sentence structure) " To change a reference redirect, the client shall first delete the reference and then re-create it with the changed location."

DS Note: I'd avoid using "location" in this context to avoid confusion with the more precise "Location" header meaning.

How about:

"To update the destination of a redirect, the client shall first delete the reference, then create a new reference with the desired destination."

TWG: Change already applied in another ticket.

6 41 32 EXAMPLE 2 GET to an object ID URI, where the URI is a reference:

Misplaced, in the middle of the example.

DS Note: The "EXAMPLE 2" line should be moved up to the top of the example.

TWG: Change approved.

7 42 35 HTTP/1.1 302 Found Location: http://archive.example.com/cdmi_objectid/

(missing line break after Found)

DS Note: Recommend that we make this change.

TWG: Change approved.

8 43 7 CMDI

Not shown as CDMI(TM), inconsistent usage and there may be others.

DS Note: Marie has only been including the TM for the first use of CDMI.

TWG: No changes needed.

9 43 27 data object can contain arbitrary binary sequences, and it shall be transported as a base 64-encoded string

Remove space -> "base64 encoded" and there may be others

DS Note: Defer to Marie regarding the correct hyphenation/spacing.

TWG: Marie to be consistent. Check RFC. RFC uses space, e.g., base 64.

10 46 123 Table 8 - Request Message Body - Create a Data Object using CDMI Content Type (Sheet 1 of 3)

Footer a not referenced or required here

DS Note: This is based on the pagination.

TWG: No change.

CHANGES Made all approved changes to 1.1c and 1.0.2.

Trac Ticket #828

CDMI 1.0.2b review through Clause 9

Description:

Here are the errors that I found:

Clause 3

1 Page 21, Line 49 - Delete OID? Only used once (Figure 5).

TWG: Change already made in another ticket.

2 Page 22, Line 75 - Fix spacing

TWG: Change approved.

Clause 5

1 Page 28, Figure 3 - Remove SNIA (twice) from graphic

TWG: Change approved.

2 Page 30, Table 3, Domain objects row - fix font

3 Page 34, Line 274 - Fix font color

4 Page 34, Line 288 - Create cross-reference to 9.3.

TWG: Change approved.

Clause 9

1 Pages 73-74, Line 26, 38, 41, 56 - fix font (remove courier)

2 Page 84, Table 40, parent ID row - bullet last paragraph

3 Page 95, Line 536 and Page 104, Line 742 - Delete colon

TWG: Change approved.

CHANGES Made all changes to 1.1c and 1.0.2.

Trac Ticket #829 Incorrect Requirement value for Creates

Description:

In Table 11 (Data object create) and in Table 72 (Queue Create), for objectName, parentURI and parentID, the requirement value should be "Mandatory".

CHANGES Made all changes to 1.1c and 1.0.2.

Trac Ticket #830 1.0.2 comments from Doug Davis

Description:

Is it possible to have continuous line numbering instead of resetting after each section?

TWG: Marie indicates this is unfortunately not possible.

section 3:

1. line 61: OCCI says "see OCCI" - kind of circular. Replace "see OCCI" with "see <OCCI spec>".
2. line 79: ditto for REST

   TWG: Marie noticed the same thing. Change approved, but link will still go to the bibliography.

   Replace "see OCCI" with "see <OCCI spec>"

   Replace "see REST" with "see <REST thesis>"

section 4:

1. line 27: why do we reference RFC2119 and then repeaet it? I'd prefer to remove the table but if we do keep it then say something like "The keyword definitions from RFC2119 are duplicated below for easy reference. In case of inconsistencies between the table and RFC2119, the RFC takes precendence."

   TWG: We are further restricting what is described in 2119. No change to text or table.

2. In clause 4.4, we need to change MUST, SHALL, etc, to lower case.

section 5:

1. line 160: "HTTP operations"? Did we mean "HTTP verbs" ? I don't get these two sentences at all - do we really overload HTTP verbs?

   TWG: Drop lines 159 and 160.

Specifically, drop the paragraph: "The HTTP verbs overloaded by CDMI for each of these resources depends on resource type. Non-overloaded HTTP operations may also be allowed for certain resources."

2 line 182: kind of weird that of all of operation/features we call out this "move w/o a name" feature right here. why?

TWG: Concept could be better, but is as intended.

3 In diagram, replace:

PUT /name, ?move? : ?/cdmi_objectid/<OID>/

with

PUT /name, {?move? : ?/cdmi_objectid/<object ID>/"}

4 and, replace:

POST /cdmi_objectID/, ?move? : ?/name

with

POST /cdmi_objectID/, {?move? : ?/name"}

5 Change

"Figure 6 - Object Lifecycle"

to

"Figure 6 - Object Transitions between Named and ID-only"

6 Remove "OID" from 3.17.

7 line 185: I don't think this is right since this doesn't "drop the name" it creates a new object w/o a name. Let's just drop this paragraph and picture.

TWG: See above.

8 line 185 - figure 6: lable is wrong - its not the lifecycle of a dataobject

TWG: See above

9 line 346: s/All examples/All examples in this international standard/

TWG: Change approved.

10 line 378: remove the "and" and the commas on each line of the list

TWG: ISO requirement for lists. No change.

section 7:

line 23: s/then re-created/then a new one created/

TWG: Rewrite sentence:

Replace:

"To change to where a reference redirects a client, the reference shall first be deleted then re-created."

with

"To update the destination of a redirect, the client shall first delete the reference, then create a new reference to the desired destination."

section 8:

1 line 14: remove "The first example addresses the data object by name, and the second addresses the data object by object ID." this is just repeating what's already stated in the examples.

TWG: Approved

2 Remove:

"The first example addresses the data object by name, and the second addresses the data object by object ID."

3 line 79: shouldn't it also show how to create by OID? via POST? Same for all other types of objects - how do I create them by OID?

TWG: Add a reference to the clause where create by OID is defined:

4 In 8.2.1, above the "Where:", add the following paragraph:

"To create a new data object by ID, see 9.9."

5 In 11.2.1, above the "Where:", add the following paragraph:

"To create a new queue object by ID, see 9.11."

6 line 91: when creating by name and it also gets an OID (not sure how we specify this), which URL is returned on the response?

TWG: Up to the server. No change needed.

7 line 209: do we allow for creation of client-specified OID?

TWG: No, except when doing a deserialization, which shouldn't be client specified. No change needed.

8 line 216: why do we not have this line in the previous section? around line 79?

TWG: Make consistent:

Line 85 should not be removed.

"After it is created, the data object shall also be accessible at <root URI>/cdmi_objectid/<objectID>."

section 9:

1 line 14,15: same as section 8 line 14's comment - remove the sentence

TWG: Change approved.

2 Remove:

"The first example addresses the container object by name, and the second addresses the container object by CDMI object identifier (ID). "

3 line 90: how do I create a container w/o a name? And does that end with a / too?

TWG: Containers must have a name.

4 line 222: the URI doesn't end with a / - are we being inconsistent?

TWG: Should have a trailing slash:

"After it is created, the container object shall also be accessible at <root URI>/cdmi_objectid/<objectID>/."

5 Also add trailing slash on line 268, 452, and 597.

CHANGES For item 5, I did a global search for trailing slash and added the slash where it was missing. Made all other approved changes to 1.1c and 1.0.2.