Partial Upload Extension

Version 1.0d

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Working Draft

Revision History

Date	Version	By	Comments
2012-11-14	1.0a	CDMI TWG	Authored at San Diego TWG meeting, and based loosely on a proposal by Tong Li from IBM, Inc.
2013-01-28	1.0b	CDMI TWG	Updates from San Jose TWG meeting.
2013-01-30	1.0c	CDMI TWG	Updates to address comments from TWG reviewers.
2013-01-30	1.0d	CDMI TWG	Final clarification as part of voting discussion.

Partial Upload Extension

Overview

CDMI 1.0.2 provides limited support for partial uploads. The below extension to the X-CDMI-Partial header is proposed to support managing conflicting uploads, and specifying completion conditions for parallel uploads:

```
X-CDMI-Partial: [ true | false ] | [ upload-id=<upload-id> [ ; [
count=<integer> | range=<byte-range> ] ] [ ; replace= { true | false } ] ]
```

Partial uploads by multiple concurrent clients are accomodated by specifying a unique "upload-id" for each set of partial uploads.

A condition is associated with an upload id to indicate when the partial upload will be considered complete. The condition may be associated with an upload id at any time. Once a condition is associated with an upload id, specifying a different condition is considered an error.

A count condition handles the scenario when a partial upload is to be completed when a specific number of partial uploads are received by the server.

A range condition handles the scenario when a partial upload is to be completed when a specific byte range is received by the server.

Replace indicates if the partial uploads replace the entire object, or just replace the specified byte ranges.

When partial uploads associated with an upload id have not completed within a given time, the upload id will time out, and the partial uploads associated with that upload id will be discarded by the server.

Modifications to the CDMI 1.0.2 spec:

1) Add a new section 5.16 "CDMI Partial Header"

CDMI defines a custom "X-CDMI-Partial" header that indicates when a partial upload is being performed. The value of this header is formatted according to the below BNF:

```
[ true | false ] | [ upload-id=<upload-id> [ ; [ count=<integer> |
range=<byte-range> ] ] [ ; replace= { true | false } ] ]
```

- "true" – Indicates that the newly created object is part of a series of uploads and the value has not yet been fully populated. These uploads are considered to have a null upload-id.
- "false" (or header not present) – Indicates that the set of uploads associated with a null upload-id shall be considered complete, and the object shall be updated.
- "upload-id" – Indicates that requests with the same upload ID are part of the set of partial uploads.
- "count" – An integer value greater than zero that indicates that when exactly this many partial uploads with the same upload ID are received, the set of uploads is considered complete, and the object shall be updated. If the number of received uploads is larger than the specified count, a 400 Bad Request will be returned.

- "range" – A byte range as specified in section 14.35.1 of RFC 2616 that indicates that when a given byte range of partial uploads with the same upload ID are received, the set of uploads is considered complete, and the object shall be updated.
- "replace" – When multiple ranges are sent as part of a partial upload, if this flag has the value "true", this indicates that the entire object shall be replaced by the set of ranged uploads (with any range gaps zero-filled). If it has the value "false" or not present, the set of uploads shall be used to update the object, not replace it.

For a given upload-id, if a condition or replace flag is received that is different from a previously received condition or replace flag, a 400 Bad Request shall be returned.

For a given upload-id, if a partial upload is received with an content-range exactly the same as a previously received content-range, the value associated with that range shall be replaced with the newer value. This allows partial uploads to be retried without error. In this case the count shall not change.

For a given upload-id, if a partial upload is received with a content-range that overlaps a previously received content-range and is not exactly the same as a previously received content-range, a 400 Bad Request shall be returned.

If a set of uploads for a particular upload-id is not complete and no messages for that upload-id are received before the timeout value specified in the cdmi_partial_timeout expires, then the server shall terminate the set and discard all previously received messages for that upload-id.

If a new object is being created using the X-CDMI-Partial header, the completionStatus field in the Response Body shall be set to "Processing" and the value of the object shall not be returned to clients until the partial upload is considered complete.

If an existing object is being updated or replaced using the X-CDMI-Partial header, the object shall not be updated until the partial upload is considered complete.

2) Insert at end of table "Table 101 - System-Wide Capabilities"

Capability Name	Type	Description
cdmi_partial	JSON String	If present and "true", this capability indicates that the cloud storage system supports the X-CDMI-Partial header "true" and "false" values.
cdmi_partial_uploadid	JSON String	If present and "true", this capability indicates that the cloud storage system supports the X-CDMI-Partial header upload ID values.
cdmi_partial_count	JSON String	If present and "true", this capability indicates that the cloud storage system supports the X-CDMI-Partial header count completion condition.
cdmi_partial_range	JSON String	If present and "true", this capability indicates that the cloud storage system supports the X-CDMI-Partial header range completion condition.
cdmi_partial_replace	JSON String	If present and "true", this capability indicates that the cloud storage system supports the X-CDMI-Partial header replace flag.
cdmi_partial_timeout	JSON String	If present, this capability indicates the upload-id timeout duration in seconds.

3) Replace the "X-CDMI-Partial" Description in clause 8.2.4, "Table 7 - Request Headers for Creating a CDMI Data Object using CDMI Content Type"

4) Replace the "X-CDMI-Partial" Description in clause 8.3.3, "Table 12 - Request Headers - Create a CDMI Data Object using a Non-CDMI Content Type"

5) Replace the "X-CDMI-Partial" Description in clause 8.6.3, "Table 21 - Request Headers - Update a CDMI Data Object using CDMI Content Type"

6) Replace the "X-CDMI-Partial" Description in clause 8.7.3, "Table 25 - Request Headers - Update a CDMI Data Object using a Non-CDMI Content Type"

Indicates that a partial upload is being performed. See clause 5.16.