Enabler Test Specification for Download OTA

Candidate Version 2.0 – 19 Dec 2006

Open Mobile Alliance

OMA-ETS-DLOTA-V2_0-20061219-C

Contents

Tables

1. Scope

This document describes in detail available test cases for OMA Download OTA version 2.0.

The test cases are split in two categories, conformance and interoperability test cases.

The conformance test cases are aimed to verify the adherence to normative requirements described in the technical specifications.

The interoperability test cases are aimed to verify that implementations of the specifications work satisfactory.

2. References

2.1 Normative References

[IOPPROC] "OMA Interoperability Policy and Process", Version 1.3, Open Mobile Alliance™, OMA-ORG-IOP_Process-V1_3, URL:http://www.openmobilealliance.org/

[RFC2119] "Key words for use in RFCs to Indicate Requirement Levels", S. Bradner, March 1997, URL:http://www.ietf.org/rfc/rfc2119.txt

[DLOTAv2-TS] "Download Over the Air Specificaition", Open Mobile Alliance™, http://www.openmobilealliance.org/

[DLOTAv2-AD] "Download Over the Air Architecture", Open Mobile Alliance™, http://www.openmobilealliance.org/

[RFC2046] "Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types". N. Freed et al. November 1996. URL:http://www.ietf.org/rfc/rfc2046.txt

[RFC2119] "Key words for use in RFCs to Indicate Requirement Levels". S. Bradner. March 1997. http://www.ietf.org/rfc/rfc2119.txt

[WSP] " Wireless Session Protocol ", WAP-230-WSP, WAP Forum™, http://www.openmobilealliance.org/

[W-HTTP] " Wireless Profiled HTTP", WAP-229-HTTP, WAP Forum™, http://www.openmobilealliance.org/

[WTLS] "Wireless Transport Layer Security", WAP-261-WTLS, WAP Forum™, http://www.openmobilealliance.org/

[WAPTLS] "WAP TLS Profile and Tunneling", WAP-219-TLS, WAP Forum™, http://www.openmobilealliance.org/

2.2 Informative References

[MIDPOTA] "Over The Air User Initiated Provisioning Recommended Practice", version 1.0, 2001, SUN Microsystems. http://java.sun.com

[MIDP] "Mobile Information Device Profile", version 1.0, 2000, SUN Microsystems, http://java.sun.com/

3. Terminology and Conventions

3.1 Conventions

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

All sections and appendixes, except “Scope”, are normative, unless they are explicitly indicated to be informative.

The following numbering scheme is used:

xxx-y.z-con-number where:

xxx	Name of enabler, DL-OTA
y.z	Version of enabler release, 2.0
’con’	Indicating this test is a conformance test case
number	Leap number for the test case

Each section uses its own number series, e.g. 100, 200, etc.

Or

xxx-y.z-int-number where:

xxx	Name of enabler, DL-OTA
y.z	Version of enabler release, 2.0
’int’	Indicating this test is a interoperability test case
number	Leap number for the test case

Each section uses its own number series, e.g. 100, 200, etc.

3.2 Definitions

Content Delivery	The actual delivery of the media object, for example by means of a HTTP GET, to the client device.
Content Download	The whole transaction including discovery, delivery of content and confirmation of download.
Content Handler	An entity in the mobile device responsible for the processing of a particular media type. The content handler typically handles issues related to installation of content, in addition to execution of content. The actual processing of retrieved content is outside the scope of this specification.
Content Storage	The physical location of the media object to be downloaded.
Discovery Application	A user agent in the device that discovers media on behalf of the user. The End User discovers content on the Web by using a Web browser or an application specifically created for a type of content. A picture editor may discover pictures, a melody composer may discover melodies, and an application manager may discover applications (e.g. games) on dedicated Web sites. Email and MMS messages may contain Web addresses to media objects available for downloading. These types of applications are collectively referred to as a *Discovery Application*.
Discovery Process	The process by which the user or device finds a resource (i.e. a Media Object) that he wants to load onto his device. The discovery can take place for example by means of a browser, a dedicated discovery application, a received message, or some offline means (like a newspaper).
Download Agent	An abbreviated form of Download User Agent.
Download Descriptor	Metadata about a *media object* and instructions to the *download agent* for how to download it. The object triggers the Download Agent in the client device. It describes the media object to be downloaded and allows the client device to decide if it has the capabilities to install and render/execute the Media Object.
Download Protocol	The actual delivery of an object is performed using the protocol specified in the Download Descriptor. The only mandatory protocol as defined in this specification is [W-HTTP] (or [WSP] if the environment is WAP 1.x). Other protocols, including full support for HTTP, may be used if supported by both parties.
Download Server	A Web server hosting *media objects* available for download. It is responsible for the download transaction from the server perspective. It handles download session management including actions triggered by the installation status

	report.
Download Service	The overall service that a client device is exposed to when it wants to select a media object and execute a download of it. A download service is typically constructed with the help of the abstract building blocks Presentation Server, Download Server and Content Storage.
Download User Agent	A user agent in the device responsible for downloading a *media object* described by a *downloaddescriptor*. Responsible for the download transaction from the client perspective. It is triggered by the reception or activation of a Download Descriptor.
Generic Content	The concept of Generic Content includes any MIME media type except the Java™ JAR media type. For this media type please see [MIDPOTA].
Installation Notification	A Status Report message from the client to the server. It indicates to the server that the Download Agent has successfully installed the Media Object, and that the content (to the best knowledge of the Download Agent) will be made available to the user.
Media Object	A resource on a Web server that can be downloaded. It may be a single object (often referred to as a file), or a container consisting of multiple objects. The mechanism for the latter may be MIME-multipart. There are no restrictions as to the characteristics of the media object, but the transfer encoding has to make it compatible with an HTTP (or WSP) transport. The download of a Media Object is the ultimate goal of each transaction undertaken with the protocol defined in this specification.
Media Object Installer	The Media Object Installer is responsible for the preparation for and execution of the installation of a particular media object. The Installer is often implemented as part of the Content Handler of the particular media type or as part of a file system manager.
Media Type	A MIME media type [RFC2046].
MIDP OTA Provisioning	The JAVA™ MIDP OTA Provisioning is defined in [MIDPOTA].
Presentation Server	A Web server presenting a download service to the user. It is one of the possible discovery mechanisms. The client device may browse a Web or WAP page at the presentation server and be redirected to the Download Server for the OMA Download transaction.
Server	All Servers in this specification are abstract, i.e. logical, entities. They are used in the specification only to help the reader to separate between different functional elements that may be implemented and deployed in any configuration.
Status Report	A message sent from the mobile device to a server to indicate the positive or negative outcome of a download transaction. In the context of Content Download the Status Report terminates the "download session" (or "download transaction").
Status Report Server	A WEB server accepting status reports from the download agent.
Well-intentioned attempt	A “well-intentioned attempt to send an Installation Status Report” means that the client device sends a Status Report under circumstances where the network connection is known (to the extent possible) to be present, and the Status Report is known to be properly formatted. If there is no network connection then an attempt to send a request should not be regarded as well-intentioned.

3.3 Abbreviations

CID	Content Identifier
DD	Download Descriptor
HTTP	HyperText Transfer Protocol
JAD	Java™ Application Descriptor
JAR	Java™ Archive
J2ME	Java™ 2 Micro Edition
MIDP	Mobile Information Device Profile
MMS	Multimedia Messaging Service
OMA	Open Mobile Alliance

OTA	Over The Air
RP	Recommended Practices
SCR	Static Conformance Requirement
URL	Universal Resource Locator
URI	Universal Resource Identifier
WAP	Wireless Application Protocol
XML	Extensible Markup Language

4. Introduction

The purpose of this document is to provide test cases for Download Enabler Release 2.0.

Broadly stated, the goals of the interoperability testing effort should be to validate client/server interactions and the readily apparent behaviours and normal working of the mobile device. For instance, it may not be feasible to set up scenarios to test the error conditions for a given specification. The following sections provide more detailed instructions how to test Download functionality.

Some features in the Download enabler may optionally be implemented in mobile devices. The tests associated with these optional features are marked as [Optional] in the test specification.

When not explicitly mentioned otherwise, the delivery mechanism used in testing is Separate Delivery. Combined delivery functionality is tested in test cases in section 6.1.3 and 6.2.1.

The following items are needed to adequately test the Download enabler:

- An origin server configured to support the download descriptor media type (application/vnd.oma.dd2+xml).
- A web page providing a link to the download descriptor (for separate delivery).
- [Optional] A web page providing a link to the combined download descriptor and media object (for co-delivery) using the MIME multipart/related content type.
- A download descriptor that can be used to test successful installation.
- A download descriptor that should generate an error condition (i.e. Attribute Mismatch).
- A download descriptor that does not contain an installNotify URL.
- For the download descriptors that contain an installNotify URL, the URL should use the “http” scheme.

The Download enabler tests are carried out using WSP and/or W-HTTP transfer protocols. Optionally also WAPTLS or WTLS may be used.

OMA DLOTA version 2.0 is an evolution of OMA DLOTA version 1.0. Backward compatibility can be achieved by also adding support for version 1.0 Download Descriptors to the Download User Agent.

5. Conformance Test Cases

5.1 Reference Content

For all test cases in this chapter a set of reference content is developed. This section describes a common structure for Download Descriptors and Media objects included in the reference content. Individual test cases may describe CHANGES to the content described here in order to have a specialized coentent for a particular test case.

5.1.1 Download Descriptors

In all conformance test cases, the tool contains a Download Ddescriptor. A basic content for the DD is assumed and for each test case, any changes to this DD are noted in the subsection “Test Content”. The basic content is the following:

DD1:

```
<media xmlns="urn:oma:xml:dl:dd:2.0" DDVersion =”2.0”>
        <product>
            <mediaObject>
                <size>2025863</size>
                <type>image/png</type>
                <objectURI>
                    <Server>../MO/Simpson.png<server>
                </objectURI>
            </mediaObject>
        </product>
</media>
```

Figure 1 Basic Download Descriptor.

Note that size, type and name of media object file mave be replaced by any of the media objects in the table below.

5.1.2 Media Object files

The following files are available:

Name	Type	Size
Blossoms.JPG	Image/jpg	1964 kB
blue_eyes_big.jpg	Image/jpg	4149 kB
Lava.GIF	Image/gif	331 kB
Malaga_bench.JPG	Image/jpg	137 kB
Malaga_park.JPG	Image/jpg	710 kB
Pelicans.bmp	Image/bmp	771 kB
Simpson.PNG	Image/png	1979 kB
SimpsonBW.bmp	Image/bmp	97 kB
sound.amr	Audio/amr	11 kB

5.2 Client

5.2.1 Download Process

5.2.1.1 Capability Checking

Test Case Id	DL-OTA-2.0-con-001
Test Object	Client
Test Case Description	To verify whether the Download Agent has enough available memory resource, is capable of using and rendering the Media Objects. This is done by including the attribute 'installSize' and verifying that a message can be downloaded successfully whe there is enough memory space available
Specification Reference	[DLOTAv2-TS] Chapter 5.2.2
SCR Reference	DLOTA-C-015 (M)
Tool	None
Test code	None
Preconditions	• Download Agent must be able to download the download descriptor. • Download Server MUST include installSize element in the DD. • Download Agent device has sufficient storage resources – at least installSize number of bytes free • Download Agent is capable of handling Media Object's type specified in type element
Test Procedure	1. User selects a URI that points to a Download Descriptor in a Download Server. 2. Download Server delivers the download descriptor to the client. 3. Download Agent verifies Download Descriptor (at minimum size, installSize and type elements) to check that is capable of handling the Media Object 4. Media Object is downloaded. 5. Download Agent installs the Media Object and sends the Installation Notification message to the server.
Pass-Criteria	1. User can choose to donwload the Media Object. 2. Download Agent notifies the User that the Media Object is stored. 3. A Installation Notification message is received in the server when the Media Object is downloaded.

Table 1: Capability Checking DL-OTA-2.0-con-001

5.2.1.1.1 Test Content

An 'installSize' attribute is present in the descriptor and is equal to size element value.

(eg <installSize>2025863</installSize>

5.2.1.2 Lack of capability

Test Case ID	DL-OTA-2.0-con-002
Test Object	Client device
Test Case Description	To test if the terminal notifies the user the lack of memory and gives the chance to free the enough memory to save the Media Object This is done by tying to download an object when there is not enough space available.
Specification Reference	[DLOTAv2-TS] Section 5.5.2 [DLOTAv2-TS] Section 6.1
SCR Reference	DLOTA-C-015 (M)
Tool	None
Test Code	None
Preconditions	• The user device is almost full, lack of capability. • The Dowload Descriptor and the Media Object are delivered separately. • InstallNotifyURI element is included in the Dowload Descriptor for sending the server the Install Notification. • DownloadNotifyURI is included in the Dowload Descriptor for sending the server the Download Notification. • The server MUST include both objectID and objectVersion elements in the mediaObject element of the DD.
Test Procedure	1. The user browses a new Media Object and decides to retrieve it. 2. The terminal (Download Agent) notifies that the memory is almost full. 3. The terminal gives the user the chance to freeing the enough memory needed for the Media Object. 4. If the memory is enough, the Media Object is downloaded.
Pass-Criteria	1. The user can choose to download the Media Object. 2. The terminal notifies the user that there is lack of capability and the user can free some memory to save the Media Object. 3. The terminal notifies the user that the Media Objects is stored. 4. A Download Completion Notification is received in the server when the Media Object is downloaded to the client.

Table 2: Lack of capability DL-OTA-2.0-con-002

5.2.1.2.1 Test Content

DownloadNotifyURI is included in the Dowload Descriptor

Both objectID and objectVersion elements are included the mediaObject element of the DD

5.2.1.3 User Confirmation

Test Case Id	DL-OTA-2.0-con-003
Test Object	Client
Test Case Description	Verify whether user confirmation is processed properly.
Specification Reference	[DLOTAv2-TS] Chapter 5.2.3
SCR Reference	DLOTA-C-016 (M)
Tool	none
Test code	none
Preconditions	• The Download Descriptor and the Media Object are delivered separately. • The Server MUST include both objectID and objectVersion elements in the mediaObject element of the Download Descriptor. • In the Download Descriptor suppressUserConfirmation element MUST BE equal to 'Never'.
Test Procedure	1. The User decides to retrieve a new Media Object. 2. After receiving the Download Descriptor, the Download Agent prompts a message to the User to confirm the download of the Media Object. 3. The User confirms the download of the Media Object.
Pass-Criteria	1. The Server receives the request and delivers the Download Descriptor. 2. The Download Agent request confirmation to the User and process it. 3. The Server receives the request and delivers the Media Object.

Table 3: User Confirmation DL-OTA-2.0-con-003

5.2.1.3.1 Test Content

Both objectID and objectVersion elements in the mediaObject element of the Download Descriptor

suppressUserConfirmation element is included andis equal to 'Never'

5.2.1.4 User Confirmation – Confirmation Not Needed

Test Case Id	DL-OTA-2.0-con-004
Test Object	Client
Test Case Description	Verify whether not using User confirmation (not requested) is processed properly.
Specification Reference	[DLOTAv2-TS] Chapter 5.2.3
SCR Reference	DLOTA-C-016 (M)
Tool	None
Test code	None
Preconditions	• The Download Descriptor and the Media Object are delivered separately. • The Server MUST include both objectID and objectVersion elements in the mediaObject element of the Download Descriptor. • In the Download Descriptor suppressUserConfirmation element MUST BE equal to 'Always'. • The Download Server MUST BE authorized by the Download Agent.
Test Procedure	1. The User decides to retrieve a new Media Object. 2. The Download Agent starts to retrieve the Media Object without prompting the User for confirmation. 3. The User can check that the Media Object is suitably downloaded.
Pass-Criteria	1. The User is NOT prompted for confirmation to download the Media Object. 2. The Server receives the request and delivers the Download Descriptor. 3. The Server receives the request and delivers the Media Object.

Table 4: User Confirmation DL-OTA-2.0-con-004

5.2.1.4.1 Test Content

suppressUserConfirmation element is included and is equal to 'Always'.

Both objectID and objectVersion elements in the mediaObject element of the Download Descriptor

5.2.1.5 User Confirmation – User Cancelled

Test Case Id	DL-OTA-2.0-con-005
Test Object	Client
Test Case Description	Verify whether User confirmation (not requested) is processed properly.
Specification Reference	[DLOTAv2-TS] Chapter 5.2.3
SCR Reference	DLOTA-C-016 (M)
Tool	None
Test code	None
Preconditions	• The Download Descriptor and the Media Object are delivered separately. • The Server MUST include both objectID and objectVersion elements in the mediaObject element of the Download Descriptor. • In the Download Descriptor suppressUserConfirmation element MUST BE equal to 'Never'
Test Procedure	1. The User decides to retrieve a new Media Object. 2. After receiving the Download Descriptor, the Download Agent prompts a message to the User to confirm the download of the Media Object. 3. The User cancels the download of the Media Object.
Pass-Criteria	1. The Server receives the request and delivers the Download Descriptor. 2. The Download Agent request confirmation to the User and process it. 3. The Server receives a "User Cancelled" status report.

Table 5: User Confirmation DL-OTA-2.0-con-005

5.2.1.5.1 Test Content

suppressUserConfirmation element MUST BE equal to 'Never'

Both objectID and objectVersion elements in the mediaObject element of the Download Descriptor

5.2.1.6 Media Object Installation

Test Case Id	DL-OTA-2.0-con-006
Test Object	Client
Test Case Description	Verify whether the Media Object is installed properly.
Specification Reference	[DLOTAv2-TS] Chapter 5.3.1
SCR Reference	DLOTA-C-027 (M)
Tool	None
Test code	None
Preconditions	• The Media Object MUST BE executable content (i.e., content that needs to be installed or rendered to be used). • InstallNotifyURI element is included in the Dowload Descriptor for sending the Server the Install Notification. • The Server MUST include both objectID and objectVersion elements in the mediaObject element of the Download Descriptor.
Test Procedure	1. The User decides to retrieve a new Media Object. 2. The Download Agent retrieves the Media Object if there is enough memory available. 3. User verifies that the Media Object is successfully retrieved. 4. User installs the new version of the Media Object.
Pass-Criteria	1. The User can choose to retrieve the Media Object. 2. An Installation Notification is received in the Server.

Table 6: Media Object Installation DL-OTA-2.0-con-006

5.2.1.6.1 Test Content

InstallNotifyURI element is included in the Dowload Descriptor

Both objectID and objectVersion elements in the mediaObject element of the Download Descriptor

5.2.1.7 Prevent access to Media Object until Status Report Succeeds (no reply)

Test Case Id	DL-OTA-2.0-con-007
Test Object	Client
Test Case Description	Verify status report mechanism in case there is no server reply (i.e. "Well-Intentioned Attempt"). This is done by configuring the server/tool to NOT respond to the Installation Notification message sent by the client.
Specification Reference	[DLOTAv2-TS] Chapter 5.3.2
SCR Reference	DLOTA-C-030 (M)
Tool	None
Test code	None
Preconditions	• The client device must be able to download the download descriptor.
Test Procedure	1. The User selects a URI that points to a download descriptor in a download server. 2. The Download server delivers the download descriptor to the client. The download descriptor includes an InstallNotifyURI attribute and an URI that references the media object. 3. The Client retrieves the media object file from the download server. 4. The Client installs the media object and sends the Installation Notification message to the server. 5. The Download server does NOT send any response to the Installation Notification.
Pass-Criteria	1. The download descriptor is delivered successfully. 2. The media object is delivered successfully. 3. As a result of a successful installation the client sends Installation Notification to the download server. 4. After timeout period the client releases the media object for use.

Table 7: Prevent access to Media Object until Status Report Succeeds (no reply) DL-OTA-2.0-con-007

5.2.1.7.1 Test Content

The download descriptor includes an InstallNotifyURI attribute

5.2.1.8 Prevent access to Media Object until Status Report Succeeds (non 200OK reply)

Test Case Id	DL-OTA-2.0-con-008
Test Object	Client
Test Case Description	Verify status report mechanism in case there is no server reply (i.e. "Well-Intentioned Attempt"). This is done by configuring the server/tool to respond with a message other than HTTP 200-series to the Installation Notification message sent by the client.
Specification Reference	[DLOTAv2-TS] Chapter 5.3.2
SCR Reference	DLOTA-C-030 (M)
Tool	None
Test code	None
Preconditions	• The client device must be able to download the download descriptor.
Test Procedure	1. The User selects a URI that points to a download descriptor on a download server. 2. The Download server delivers the download descriptor to the client. The download descriptor includes an InstallNotifyURI attribute and an URI that references the media object. 3. The Client retrieves the media object file from the download server. 4. The Client installs the media object and sends the Installation Notification message to the server. 5. The Download server acknowledges the Installation Notification with other than HTTP 200-series response code (i.e. with 300-, 400- or 500-series response code).
Pass-Criteria	1. The download descriptor is delivered successfully. 2. The media object is delivered successfully. 3. As a result of a successful installation the client sends Installation Notification to the download server. 4. The media object is not made available to the user.

Table 8: Prevent access to Media Object until Status Report Succeeds (non 200OK reply) DL-OTA-2.0-con-008

5.2.1.8.1 Test Content

The InstallationNotification URI points at a non-existing file, which should generate a server error.
(<installNotifyURI>nonexisting_file</installNotifyURI>

5.2.1.9 White List – no server configured

Test Case Id	DL-OTA-2.0-con-009
Test Object	Client
Test Case Description	Verify whether white list is processed properly when no server is configured. This is done by verifying that if no server is configured in the white list, the client will ask for user consent even when the 'supressUserNotification' field is present in the DD and has the value 'Always'.
Specification Reference	[DLOTAv2-TS] Chapter 8.3
SCR Reference	DLOTA-C-054 (M)
Tool	None
Test code	None
Preconditions	• There is NO server configured in the White List of the client
Test Procedure	1. The User selects a URI that points to a download descriptor in a download server. 2. The Download server delivers the download descriptor to the client. 3. The client asks for User Consent to download the media object 4. The User gives consent 5. The Client retrieves the media object file from the download server. 6. The Client installs the media object
Pass-Criteria	1. The client does ask for user consent before downloading the media object 2. The client downloads the media object after the User has given consent

Table 9: White List – no server configured DL-OTA-2.0-con-009

5.2.1.9.1 Test Content

The 'supressUserNotification' field is present in the DD and has the value 'Always'

5.2.1.10 White List – server is configured

Test Case Id	DL-OTA-2.0-con-010
Test Object	Client
Test Case Description	Verify whether white list is processed properly when the used server is configured. This is done by verifying that if the used server is configured in the white list, the client will NOT ask for user consent when the 'supressUserNotification' field is present in the DD and has the value 'Always'.
Specification Reference	[DLOTAv2-TS] Chapter 8.3
SCR Reference	DLOTA-C-054 (M)
Tool	None
Test code	None
Preconditions	• The used server IS configured in the White List of the client
Test Procedure	1. The User selects a URI that points to a download descriptor in a download server. 2. The Download server delivers the download descriptor to the client. 3. The client downloads the media object without asking for User Consent 4. The Client installs the media object
Pass-Criteria	1. The client does NOT ask for user consent before downloading the media object 2. The client downloads the media object

Table 10: White List – server is configured DL-OTA-2.0-con-010

5.2.1.10.1 Test Content

The 'supressUserNotification' field is present in the DD and has the value 'Always'

5.2.1.11 Use of MMS to fetch DD

Test Case Id	DL-OTA-2.0-con-011
Test Object	Client
Test Case Description	Verify whether Download Descriptors can be fetched by using MMS This is done by sending a DD using MMS to the client, invoking this DD and let client retrieve the media object.
Specification Reference	[DLOTAv2-TS] Chapter 5.1
SCR Reference	DLOTA-C-005 (O)
Tool	None
Test code	None
Preconditions	• The Client supports handling DDs that comes in an MMS
Test Procedure	1. The client receives an MMS that contains a DD. 2. The User opens the MMS and invokes the DD (e.g. double-clicking on it or chooses to download the object through an option menu). 3. The client downloads the media objects.
Pass-Criteria	1. The user can invoke the DD in order to initiate the media object retrieval. 2. The client downloads the correct media object.

Table 11: Use of MMS to fetch DD DL-OTA-2.0-con-011

5.2.1.11.1 Test Content

Separate DD to be sent as MMS.

Standard media object to be referenced.

5.2.1.12 Updating media objects using MMS mechanism of reception

Test Case ID	DL-OTA-2.0-con-012
Test Object	Client
Test Case Description	To verify that a Media Object already stored on the client device is correctly updated, when the DD is sent through MMS.
Specification Reference	[DLOTAv2-TS] Section 5.1 [DLOTAv2-AD] Section 6.4
SCR Reference	DLOTA-C-005 (O)
Tool	None
Test Code	None
Preconditions	• A newer version of the Media Object than the version present in the client is available on to the server. • • The InstallNotifyURI element is included in the Download Descriptor • The server MUST include both objectID and objectVersion elements in the mediaObject element of the DD.
Test Procedure	1. The client receives an MMS that contains a DD. 2. The User opens the MMS and invokes the DD (e.g. double-clicking on it or chooses to download the object through an option menu). 3. The client downloads the media object 4. The new version of the Media Object is installed, replacing the older version.
Pass-Criteria	1. The usercan invoke the DD in order to initiate the media object retrieval. 2. The client downloads the correct media object. 3. The Media Object is successfully installed, and the server receives a Installation Notification.

Table 12: Use of MMS to fetch DD DL-OTA-2.0-con-012

5.2.1.12.1 Test Content

InstallNotifyURI element is included in the Dowload Descriptor

both objectID and objectVersion elements in the mediaObject element of the DD

5.2.1.13 Media Object Retrieval from Multiple Servers

Test Case ID	DL-OTA-2.0-con-013
Test Object	Client
Test Case Description	To test if a Media Object can be downloaded simultaneously in the same OTA session from different sources. This is done by storing the same Media Object on several servers and retrieving the same Media Objects from these servers in parallel. As soon as the first Media Object is successfully retrieved, the other retrievals are cancelled.
Specification Reference	[DLOTAv2-TS] Section 5.2.4.5 [DLOTAv2-AD] Section 6.6
SCR Reference	DLOTA-C-023 (O)
Tool	None
Test Code	None
Preconditions	• The Content Portal knows the servers where the Media Objects are hosted. • The Content Portal creates the Donwload Descriptor, with the same Media Objects located in different Donwload Servers. • The Dowload Descriptor and the Media Object are delivered separately. • InstallNotifyURI element is included in the Dowload Descriptor for sending the Content Portal the Install Notification. • DownloadNotifyURI is included in the Dowload Descriptor for sending to every server the Download Notification. • The content portal MUST include both objectID and object Version elements in the media Object element of the DD.
Test Procedure	1. The user browses a Media Object and decides to retrieve it. 2. The terminal (Download Agent) begins to retrieve the Media Object, if there is enough memory available, from all servers. 3. User verifies that the Media Object is successfully retrieved. 4. The download agent discards the downloading of the rest of Media Objects that are in process.
Pass-Criteria	1. The user can choose to download correctly the Media Object that exists in diferent servers. 2. The terminal retrieves correctly the Media Object and gives the user the option to perform an specific action with it. 3. A Download Completion Notification is received in the server when each Media Object is downloaded to the client. 4. Only one Media Object has been installed/downladed

Table 13: Media Object rwetrieval from Multiple Servers DL-OTA-2.0-con-013

5.2.1.13.1 Test Content

The DD contains the objectURI for several different servers, but referencing the same Media Object.

InstallNotifyURI element is included in the Dowload Descriptor

DownloadNotifyURI is included in the Dowload Descriptor

both objectID and object Version elements in the media Object element of the DD

5.2.1.14 Product Retrieval From Multiple Servers (Product composed by several different Media Object from different Servers).

Test Case Id	DL-OTA-2.0-con-014
Test Object	Client
Test Case Description	Verify whether a Product (composed by several different Media Object from different Servers) retrieval from multiple Servers is processed properly.
Specification Reference	[DLOTAv2-TS] Chapter 5.2.4.5
SCR Reference	DLOTA-C-023 (M)
Tool	None
Test code	None
Preconditions	• `objectURI` element is included in the Download Descriptor for the Download Agent to locate the Media Objects. • Multiple `server` elements are included in the `objectURI` element of the Download Descriptor. • Media Objects must be available in all specified Servers.
Test Procedure	1. The User decides to retrieve a new Product. 2. The Download Agent checks that there is enough memory available. 3. The Download Agent verifies that the Media Objects are available in the different Servers. 4. The Download Agent MUST use the Status Report mechanism (if requested in the Download Descriptor) for notifying download status to different Servers.
Pass-Criteria	1. The Media Objects composing the Product are successfuly installed in the Device. 2. Download Agent reconstructs Media Objects as soon as it receives data from a subset of the DLOTA Servers. 3. The Servers are notified (if necessary) through the Status Report.

Table 14: Product retrieval from Multiple Servers DL-OTA-2.0-con-014

5.2.1.14.1 Test Content

The DD contains the objectURIs for several different servers, and referencing different Media Objects

DownloadNotifyURI is included in the Dowload Descriptor

5.2.1.15 Post License

Test Case Id	DL-OTA-2.0-con-015
Test Object	Client
Test Case Description	Verify whether the download of Post License is processed properly.
Specification Reference	[DLOTAv2-TS] Chapter 5.3.2
SCR Reference	DLOTA-C-028 (O)
Tool	None
Test code	None
Preconditions	• Download Descriptor has a 'license' element for the Media Object. • Download Descriptor has an 'order' element equal to 'post'. • InstallNotifyURI element is included in the Download Descriptor for sending the Content Portal the Install Notification. • DownloadNotifyURI is included in the Download Descriptor for sending to the Server the Download Notification. • DRM Agent is present in the Terminal and it can successfully retrieve licenses. • DRM Agent communicates the status of the license retrieval to the Download Agent.
Test Procedure	1. The User browses a new Media Object and decides to retrieve it. 2. The Download Agent begins to retrieve the Media Object if there is enough memory available. 3. User verifies that the Media Object is successfully retrieved. 4. The User installs the Media Object.
Pass-Criteria	1. The User can choose to download a Media Object. 2. The Download Agent retrieves correctly the Media Object. 3. A Download Completion Notification is received in the Server. 4. The Download Agent passes the value of the 'license' element to the DRM Agent. 5. The Download Agent receives (from the DRM Agent) the status of the license retrieval. 6. After the successful installation of the Media Object, the Server receives an Installation Notification including the License retrieval status included.

Table 15: Post License DL-OTA-2.0-con-015

5.2.1.15.1 Test Content

Download Descriptor has a 'license' element for the Media Object

DownloadNotifyURI is included in the Dowload Descriptor

InstallNotifyURI element is included in the Download Descriptor

5.2.1.16 License Retrieval

Test Case Id	DL-OTA-2.0-con-016
Test Object	Client
Test Case Description	Verify whether the retrieval of a DRM license is processed properly.
Specification Reference	[DLOTAv2-TS] Chapter 5.2.5
SCR Reference	DLOTA-C-024 (O) (DLOTA-S-018 (O))
Tool	None
Test code	None
Preconditions	• Download Descriptor has a 'license' element for the Media Object. • Download Descriptor has an 'order' element equal to 'post'. • DownloadNotifyURI is included in the Download Descriptor for sending to the Server the Download Notification. • DRM Agent is present in the Terminal and it can successfully retrieve licenses. • DRM Agent communicates the status of the license retrieval to the Download Agent.
Test Procedure	1. The User browses a new Media Object and decides to retrieve it. 2. The Download Agent retrieves the Media Object. 3. User verifies that the Media Object is successfully retrieved.
Pass-Criteria	1. The User can choose to download a Media Object. 2. The Download Agent retrieves correctly the Media Object. 3. The Download Agent passes the value of the 'license' element to the DRM Agent. 4. The Download Agent receives (from the DRM Agent) the status of the license retrieval. 5. A Download Completion Notification is received in the Server. This report includes the license retrieval status.

Table 16: License Retrieval DL-OTA-2.0-con-016

5.2.1.16.1 Test Content

Download Descriptor has a 'license' element for the Media Object

Download Descriptor has an 'order' element equal to 'post'

DownloadNotifyURI is included in the Download Descriptor

5.2.1.17 License Retrieval (Sequential retrieval)

Test Case Id	DL-OTA-2.0-con-017
Test Object	Client
Test Case Description	Verify whether the Media Object is installed properlyLicense Retrieval is processed properly.
Specification Reference	[DLOTAv2-TS] Chapter 5.2.5
SCR Reference	DLOTA-C-024 (O) (DLOTA-S-018 (O))
Tool	None
Test code	None
Preconditions	• Media Object or Product includes `license` element. • Device supports OMA DRMv2 and functionality associated to `license` element. • Both License element and Media Object are retrieved in a sequential way.
Test Procedure	1. The User decides to retrieve a new Media Object. 2. The Download Agent checks that there is enough memory available. 3. The Download Agent MUST pass the contents of the `license` element transparently to the appropriate DRM Agent.
Pass-Criteria	1. License referenced by the first `license` element MUST be retrieved by the DRM Agent before downloading the Media Object. 2. The DRM Agent retrieves the appropriate License and reports to the Download Agent the result of License Retrieval. 3. The Download Agent MUST include the License retrieval status in any further report sent to the Server.

Table 17: License Retrieval (sequential retrieval) DL-OTA-2.0-con-017

5.2.1.17.1 Test Content

Media Object or Product includes `license` element

5.2.1.18 License Retrieval (Parallel retrieval)

Test Case Id	DL-OTA-2.0-con-018
Test Object	Client
Test Case Description	Verify whether the Media Object is installed properlyLicense Retrieval is processed properly.
Specification Reference	[DLOTAv2-TS] Chapter 5.2.5
SCR Reference	DLOTA-C-024 (O) (DLOTA-S-018 (O))
Tool	None
Test code	None
Preconditions	• Media Object or Product includes `license` element. • Device supports OMA DRMv2 and functionality associated to `license` element. • Both License element and Media Object are retrieved in parallel.
Test Procedure	1. The User decides to retrieve a new Media Object. 2. The Download Agent checks that there is enough memory available. 3. The Download Agent MUST pass the contents of the `license` element transparently to the appropriate DRM Agent.
Pass-Criteria	1. Retrieval of the License referenced by the first `license` element MUST start before or at the same time as the downloading of the Media Object (or before the downloading of the first Media Object of a Product). 2. The DRM Agent retrieves the appropriate License and reports to the Download Agent the result of License Retrieval. 3. The Download Agent MUST include the License retrieval status in any further report sent to the Server.

Table 18: License Retrieval (parallel retrieval) DL-OTA-2.0-con-018

5.2.1.18.1 Test Content

Media Object or Product includes `license` element

5.2.1.19 Navigate Browser to NextURL

Test Case Id	DL-OTA-2.0-con-019
Test Object	Client
Test Case Description	Verify whether Navigate browser to nextURL is processed properly This is done by including a NextURL in the DD and attempting to use this from the client.
Specification Reference	[DLOTAv2-TS] Chapter 5.4.1
SCR Reference	DLOTA-C-032 (O)
Tool	None
Test code	None
Preconditions	• The client device must be able to download the download descriptor. • The client device supports NextURL functionality.
Test Procedure	1. The User selects a URI that points to a download descriptor in a download server. 2. The Download server delivers the download descriptor to the client. The download descriptor includes an URI that references the media object. 3. The Client retrieves the media object from the download server. 4. The Client installs the media object. 5. The User selects the NextURL in order to continue with browsing operation.
Pass-Criteria	1. The download descriptor is delivered to the client successfully. 2. The media object is delivered and installed to the client successfully. 3. The Download Agent invokes the URL defined by the NextURL attribute.

Table 19: Navigate Browser to NextURL DL-OTA-2.0-con-019

5.2.1.19.1 Test Content

nextURL element is present in the DD

5.2.1.20 Navigate Browser to Support URI

Test Case Id	DL-OTA-2.0-con-020
Test Object	Client
Test Case Description	Verify whether Navigate browser to support URI is processed properly This is done by including a SupportURI in the DD and attempting to use this from the client.
Specification Reference	[DLOTAv2-TS] Chapter 5.4.1
SCR Reference	DLOTA-C-033 (O)
Tool	None
Test code	None
Preconditions	• The client device must be able to download the download descriptor. • The client device supports SuportURI functionality.
Test Procedure	1. The User selects a URI that points to a download descriptor in a download server. 2. The Download server delivers the download descriptor to the client. The download descriptor includes an URI that references the media object. 3. The Client retrieves the media object from the download server. 4. The Client installs the media object. 5. The User selects the SupportURI in order to continue with browsing operation.
Pass-Criteria	1. The download descriptor is delivered to the client successfully. 2. The media object is delivered and installed to the client successfully. 3. The Download Agent invokes the URL defined by the SupportURI attribute.

Table 20: Navigate Browser to Support URI DL-OTA-2.0-con-020

5.2.1.20.1 Test Content

supportURI element is present in the DD

5.2.1.21 Progressive Download

Test Case ID	DL-OTA-2.0-con-021
Test Object	Client
Test Case Description	To check if the terminal can start the rendering of the Media Object while that is downloading, without completing the download process.
Specification Reference	[DLOTAv2-TS] Section 7.2.3.3.7 [DLOTAv2-AD] Section 6.15
SCR Reference	DLOTA-C-048 (O)
Tool	None
Test Code	None
Preconditions	• Progressive download is supported by the device, the terminal (Download Agent) can start rendering the content while the download is in progress. • The Dowload Descriptor and the Media Object are delivered separately. • The progressiveDownloadFlag is set to a true value. • InstallNotifyURI element is included in the Dowload Descriptor for sending the server the Install Notification. • DownloadNotifyURI is included in the Dowload Descriptor for sending the server the Download Notification. • The server MUST include both objectID and objectVersion elements in the mediaObject element of the DD.
Test Procedure	1. The user browses a new Media Object and decides to retrieve it. 2. The terminal (Donwload Agent) begins the downloading of the Media Objet, if there is enough memory. 3. A time later (when the terminal (Download Agent) has enough amount of data) the rendering application starts.
Pass-Criteria	1. The terminal (Donwload Agent) starts to fetch the Media Object. 2. The rendering application starts without problem and the download session continues without interruption. 3. The terminal notifies the user that the donwload process was succesful. 4. A Download Completion Notification is received in the server when the Media Object is downloaded to the client.

Table 21: Progressive Download DL-OTA-2.0-con-021

5.2.1.21.1 Test Content

The progressiveDownloadFlag is set to a true value.

InstallNotifyURI element is included in the Dowload Descriptor for sending the server the Install Notification.

DownloadNotifyURI is included in the Dowload Descriptor for sending the server the Download Notification.

Both objectID and objectVersion elements are included in the mediaObject element of the DD.

5.2.1.22 MIDP Extension

Test Case Id	DL-OTA-2.0-con-022
Test Object	Client
Test Case Description	Verify whether the MIDP JAD is wrapped and processed properly using the environment element.
Specification Reference	[DLOTAv2-TS] Chapter 10
SCR Reference	DLOTA-C-060 (O) (DLOTA-S-039 (O))
Tool	None
Test code	None
Preconditions	• `The environment` element is included in the Download Descriptor. • The `envtype` attribute of the environment element is supported by the Download Agent. • The `envtype` unambiguously identifies the information set that can be included inside the environment element and the content handler of the Media Object. • The possible values of `envtype,` syntax and semantics of the internal meta data structures depend on separate environment specific standards. • The retrieval of all associated licenses is already done. • `installNotifyURI` element is present in the Download Descriptor. • The Device supports MIDP Content, this is, it is capable of install and execute MIDP Java code.
Test Procedure	1. The Download Agent retrieves the Download Descriptor from the Download Server.
Pass-Criteria	1. The Download Agent MUST send installation notification. 2. Both the Download Agent and MIDP AMS MUST NOT request any User input. 3. The Download Agent MUST proceed as normal for retrieving the MIDlet.

Table 22: MIDP Extension DL-OTA-2.0-con-022

5.2.1.22.1 Test Content

The `environment` element is included in the Download descriptor

`installNotifyURI` element is present in the Download Descriptor

5.2.2 Status Reporting

5.2.2.1 Proper formatting of status report

Test Case Id	DL-OTA-2.0-con-101
Test Object	Client
Test Case Description	Verify whether status report is formatted properly advertised This is done by downloading a product, containing several Media Objects, at least one of which has an associated License. The resulting Status Report should contain several parts, reporting on these media Objects.
Specification Reference	[DLOTAv2-TS] Chapter 6.2
SCR Reference	DLOTA-C-044 (M)
Tool	none
Test code	none
Preconditions	• The Server contains a complex Product, containing several Media Objects, at least one of which has an associated License • The Download Descriptor used, includes the request for status report (installation notification requested)
Test Procedure	1. The User selects a URI that points to a download descriptor in a download server. 2. The Download server delivers the download descriptor to the client. 3. The Product is downloaded and the status report sent to the server.
Pass-Criteria	1. The Status report contains an OverallStatusReport, and one DetailStatusReport for each Media Object in the Product. There is also an OverallLicencseStatus present.

Table 23: Proper formatting of status report DL-OTA-2.0-con-101

5.2.2.1.1 Test Content

The DD point at a complex Product, containing several Media Objects, at least one of which has an associated License

installation notification is requested in the DD

5.2.2.2 Download Confirmation Without `nextURL` Element

Test Case Id	DL-OTA-2.0-con-102
Test Object	Client
Test Case Description	Verify whether the Download Confirmation to the user is processed properly.
Specification Reference	[DLOTAv2-TS] Chapter 5.4.1
SCR Reference	DLOTA-C-031 (O)
Tool	None
Test code	None
Preconditions	• The Download Descriptor does NOT contain a `supressUserConfirmation` element or it is NOT set to 'Always'. • `NextURL` element is NOT included in the Download Descriptor.
Test Procedure	1. The User decides to retrieve a new Media Object. 2. The Download Agent checks that there is enough memory available. 3. The Download Agent starts the download transaction. Download transaction may end successfully or fail. 4. Once the Download Agent downloads all post License elements and sends Status Report (if requested by including installNotifyURI element in the Download Descriptor).
Pass-Criteria	1. The Download Agent SHOULD indicates the result of the transaction to the User. 2. The Download Agent SHOULD presents the User the option to continue with a local context operation and MAY offer the user to continue with a browsing operation.

Table 24: Download Confirmation without nextURL DL-OTA-2.0-con-102

5.2.2.2.1 Test Content

- "`suppressUserConfirmation`" element is NOT present in the DD
- "`installNotifyURI`" element is NOT present in the DD
- "`nextURL`" element is NOT present.

5.2.2.3 Download Confirmation With `nextURL` Element

Test Case Id	DL-OTA-2.0-con-103
Test Object	Client
Test Case Description	Verify whether the Download Confirmation to the user is processed properly.
Specification Reference	[DLOTAv2-TS] Chapter 5.4.1
SCR Reference	DLOTA-C-031 (O)
Tool	None
Test code	None
Preconditions	• The Download Descriptor does NOT contain a `supressUserConfirmation` element or it is NOT set to 'Always'. • The Download Descriptor includes `nextURL` element.
Test Procedure	1. The User decides to retrieve a new Media Object. 2. The Download Agent checks that there is enough memory available. 3. The Download Agent starts download transaction. 4. Download transaction may end successfully or fail. 5. The Download Agent presents the User the option to either continue with a local context operation or to continue with a browsing operation. 6. The User decides to continue with a browsing operation.
Pass-Criteria	1. The Download Agent SHOULD present the User the option to either continue with a local context operation or to continue with a browsing operation. 2. The Download Agent SHOULD invoke the URL defined in the `nextURL` element.

Table 25: Download Confirmation with nextURL DL-OTA-2.0-con-103

5.2.2.3.1 Test Content

"`suppressUserConfirmation`" element is NOT present in the DD

"`installNotifyURI`" element is NOT present in the DD

"`nextURL`" element IS present

5.2.3 Download Descriptor

5.2.3.1 Download Descriptor Processing Rules

Test Case Id	DL-OTA-2.0-con-201
Test Object	Client
Test Case Description	Verify whether the Download Descriptor is properly parsed and properly processed.
Specification Reference	[DLOTAv2-TS] Chapter 5.2.1.1, 7
SCR Reference	DLOTA-C-014 (M) DLOTA-C-045 (M),
Tool	None
Test code	None
Preconditions	• The client device must be able to download the Download Descriptor. There are seven Download Descriptor files available. Theycontain many of the attributes specified in [DLOTAv2-TS] . • The DDs are taken from the examples in Appendix D of [DLOTAv2-TS] and are slightly modified/corrected
Test Procedure	1. The User selects a URI that points to one of the download descriptors on the download server. 2. The Download server delivers the download descriptor to the client. 3. The User verifies the attributes (if possible). The user does NOT attempt to download the media object. 4. The User selects a URI that points to the next download descriptor , etc. 5. All seven download descriptors shall be tried
Pass-Criteria	1. All download descriptors are delivered to the client successfully. 2. The Download Descriptors are processed so that optional attributes are ignored if not supported. 3. For attributes that occurs more that once, all but the first occurrence must be ignored. Exceptions are attribute that may occur multiple times, e.g. **Type, media object, product, server, text. Etc.** for these, multiple instances must be supported. 4. Where Download Descriptors reference content which is not supported by the client, the client may reject the complete DD.

Table 26: Download Descriptor Processing Rules DL-OTA-2.0-con-201

5.2.3.1.1 Test Content

The Download Descriptors from Appendix D of [DLOTAv2-TS], D.3 through D.9 are used.

5.2.3.2 Client advertise support of DD Media Type

Test Case Id	DL-OTA-2.0-con-202
Test Object	Client
Test Case Description	Verify whether the Download Descriptor media type is properly advertised by the client This is done by checking the HTTP headers, when using HTTP as the transport protocol.
Specification Reference	[DLOTAv2-TS] Chapter 5.5.1, 5.5.1.1
SCR Reference	DLOTA-C-036 (M)
Tool	**protocol analysis tool**
Test code	none
Preconditions	• The Server uses HTTP as a transport protocol when communicating with the Client. • A protocol analysis tool is available and it is possible to analyse the traffic between server and client.
Test Procedure	1. A protocol analysis tool is set up to trace the communication between server and client. 2. The User selects a URI that points to a download descriptor in a download server. 3. The Download server delivers the download descriptor to the client. 4. The client offers the user a choice to download the Media Object or starts to download media Object 5. The headers of the request message (from client to server) is analysed
Pass-Criteria	1. The HTTP Accept header is present and contains the value: `application/vnd.oma.dd2+xml` 2. The Client enters the Download application and allows the User to start download media object or automatically starts to download media object.

Table 27: Client advertise support of DD Media Type DL-OTA-2.0-con-202

5.2.3.2.1 Test Content

None.

5.2.4 Error flow

5.2.4.1 Capabilities check (Insufficient memory)

Test Case Id	DL-OTA-2.0-con-401
Test Object	Client
Test Case Description	To verify that Download Agent aborts download of a Media Object when it's size exceeds available memory resources in case Download Server suppresses user confirmation. This is done by checking the Download Descriptor elements: size, installSize, suppressUserConfirmation and checking the Agent's white list
Specification Reference	[DLOTAv2-TS] Chapter 5.2.2
SCR Reference	DLOTA-C-015 (M)
Tool	None
Test code	None
Preconditions	• installSize element is included in the Download Descriptor. • suppressUserConfirmation element is included in the Download Descriptor and is set to 'Always' • Download Agent device has insufficient storage resources to install the Media Object – storage available is less than installSize number of bytes free. • Download Server name is present in Download Agent's white list (Download Server can be authorized).
Test Procedure	1. User selects a URI that points to a Download Descriptor in a Download Server. 2. Download Server delivers the download descriptor to the client. 3. Download Agent verifies Download Descriptor and discovers that installSize element is greater than amount of storage available. 4. As suppressUserConfirmation element is set to 'Always' and Download Server can be authorized Download Agent terminates download session and sends 901 "Insufficient memory" status report.
Pass-Criteria	1. Media Object was not downloaded and installed. 2. 901 "Insufficient memory" status report is received in the server.

Table 28: Capability Checking DL-OTA-2.0-con-401

5.2.4.1.1 Test Content

installSize element is present in the descriptor and is equal to size element value.

(eg <installSize>2025863</installSize>)

suppressUserConfirmation element is present in the descriptor and is set to 'Always'.

(<suppressUserConfirmation>Always</suppressUserConfirmation>)

5.2.4.2 Download Descriptor version validation (Invalid DD Version)

Test Case Id	DL-OTA-2.0-con-402
Test Object	Client
Test Case Description	Verify whether the version of the Download Descriptor is supported by the Download Agent This is done by checking the Status Report delivery when the device is not compatible with the "major" version of the download descriptor.
Specification Reference	[DLOTAv2-TS] Chapter 5.2.1
SCR Reference	DLOTA-C-013 (O)
Tool	None
Test code	None
Preconditions	• The client device must be able to download the download descriptor. • The client device is not compatible with the "major" version of the download descriptor, as indicated in the attribute Version (that is a parameter to the attribute Media).
Test Procedure	1. User selects a URI that points to a download descriptor in a download server. 2. Download server delivers the download descriptor to the client. The download descriptor includes an InstallNotifyURI attribute and an URI that references the media object. 3. (Client retrieves the media object file from the download server).
Pass-Criteria	1. The download descriptor is delivered successfully. 2. The client sends Installation Notification with errors status "951 Invalid DDVersion" to the download server. This event may occur before or after retrieval of the media object. The media object is not made available to the user.

Table 29: Download Descriptor version validation (Invalid DD Version) DL-OTA-2.0-con-402

5.2.4.2.1 Test Content

DD version is set to 3.0

5.2.4.3 Status report mechanism (Unsuccessful Notification – Insufficient Memory)

Test Case Id	DL-OTA-2.0-con-403
Test Object	Client
Test Case Description	Verify whether status report mechanism is processed properly in case of an unsuccessful installation This is done by attemting to download a media object which does not fit in existing memory space of the client.
Specification Reference	[DLOTAv2-TS] Chapter 5.3
SCR Reference	DLOTA-C-026 (M)
Tool	none
Test code	none
Preconditions	• The client device must be able to download the download descriptor. • There is not enough storage space in the client device for the media object i.e. the media object file is bigger than the size of the available memory.
Test Procedure	1. The User selects a URI that points to a download descriptor in a download server. 2. The Download server deliveres the download descriptor to the client. The download descriptor includes an InstallNotifyURI attribute and an URI that references the media object. 3. (Client retrieves the media object file from the download server.)
Pass-Criteria	1. The download descriptor is delivered successfully. 2. The client sends Installation Notification with errors status “901 Insufficient memory” to the download server. This event may occur before or after retrieval of the media object. The media object is not made available to the user.

Table 30: Status report mechanism (Unsuccessful Notification – Insufficient Memory) DL-OTA-2.0-con-403

5.2.4.3.1 Test Content

Installation Notification is requested

Content referenced is too large for client.

5.2.4.4 Status report mechanism (Unsuccessful Notification – Device Aborted)

Test Case Id	DL-OTA-2.0-con-404
Test Object	Client
Test Case Description	Verify whether status report mechanism is processed properly in case of an unsuccessful installation when the Device aborts the operation.
Specification Reference	[DLOTAv2-TS] Chapter 5.3
SCR Reference	DLOTA-C-026 (M)
Tool	None
Test code	None
Preconditions	• InstallNotifyURI element is included in the Download Descriptor for sending the Content Portal the Install Notification. • DownloadNotifyURI is included in the Download Descriptor for sending to the Server the Download Notification. • The Media Object is a corrupted content making the Terminal to abort the installation process.
Test Procedure	1. The User browses a new Media Object and decides to retrieve it. 2. The Download Agent begins to retrieve the Media Object if there is enough memory available. 3. User verifies that the Media Object is successfully retrieved. 4. The User tries to install the Media Object.
Pass-Criteria	1. The User can choose to download a Media Object. 2. The Download Agent retrieves correctly the Media Object. 3. A Download Completion Notification is received in the Server. 4. The Server receives a “Device Aborted” status report.

Table 31: Status report mechanism (Unsuccessful Notification – Device Aborted) DL-OTA-2.0-con-404

5.2.4.4.1 Test Content

InstallNotifyURI element is included in the Download Descriptor

DownloadNotifyURI is included in the Download Descriptor

Media Object is a corrupted content

5.2.4.5 Updating Media Object is aborted by the user

Test Case ID	DL-OTA-2.0-con-405
Test Object	Client
Test Case Description	To test that the server is notified in case of a failure during the update process
Specification Reference	[DLOTAv2-TS] Section 5.2.4 [DLOTAv2-AD] Section 6.1
SCR Reference	DLOTA-C-017 (M)
Tool	None
Test Code	None
Preconditions	• A new version of the Media Object has to be available in to the server. • The Dowload Descriptor and the Media Object are delivered separately. • InstallNotifyURI element is included in the Dowload Descriptor for sending the server the Install Notification. • DownloadNotifyURI is included in the Dowload Descriptor for sending the server the Download Notification. • The server MUST include both objectID and objectVersion elements in the mediaObject element of the DD.
Test Procedure	1. The terminal has to know (left to implementation) that a new version of the Media Object is available into the server. 2. The terminal notifies the user that the version available is newer than the version installed. 3. User confirms donwload/update. 4. The terminal (Download Agent) begins to retrieve the Media Object if there is enough memory available. 5. The download process is aborted by the user (i.e. pressing a cancel button).
Pass-Criteria	1. The terminal notifies the user the newer version of the Media Object. 2. The client can choose to retrieve the Media Object. 3. The user aborts the downloading and the server must be notified with a “device aborted” message.

Table 32: Updating Media Object is aborted by the user DL-OTA-2.0-con-405

5.2.4.5.1 Test Content

InstallNotifyURI element is included in the Dowload Descriptor

DownloadNotifyURI is included in the Dowload Descriptor

Both objectID and objectVersion elements in the mediaObject element of the DD

5.2.4.6 Updating Media Object from a different source than the old one

Test Case ID	DL-OTA-2.0-con-406
Test Object	Client
Test Case Description	To test if a Media Object coming from a diferent source that the old Media Object causes Stop.
Specification Reference	[DLOTAv2-TS] Section 5.2.4 [DLOTAv2-AD] Section 6.1
SCR Reference	DLOTA-C-017 (M)
Tool	None
Test Code	None
Preconditions	• The media object is available in a different Download Server. • The Dowload Descriptor and the Media Object are delivered separately. • InstallNotifyURI element is included in the Dowload Descriptor for sending the server the Install Notification • DownloadNotifyURI is included in the Dowload Descriptor for sending the server the Download Notification • The server MUST include both objectID and objectVersion elements in the mediaObject element of the DD.
Test Procedure	1. The terminal has to know (left to implementation) that a new version of the Media Object is available into the server. 2. The terminal notifies the user that the version available is newer than the version installed, but it is located in a different server than the oldest version. 3. The terminal notifies the user that the download process must be interrupted.
Pass-Criteria	1. The terminal notifies the user the newer version of the Media Object. 2. The terminal notifies the Media Objects is not allow. 3. The server receives a Failure Notification from the terminal.

Table 33: Updating Media Object from a different source than the old one DL-OTA-2.0-con-406

5.2.4.6.1 Test Content

InstallNotifyURI element is included in the Dowload Descriptor

DownloadNotifyURI is included in the Dowload Descriptor

Both objectID and objectVersion elements in the mediaObject element of the DD

5.2.4.7 Updating Media Object fails

Test Case ID	DL-OTA-2.0-con-407
Test Object	Client
Test Case Description	To test that the server is notified in case of a failure during the update process.
Specification Reference	[DLOTAv2-TS] Section 5.2.4 [DLOTAv2-AD] Section 6.1
SCR Reference	DLOTA-C-017 (M)
Tool	None
Test Code	None
Preconditions	• A new version of the Media Object has to be available in to the server. • The Dowload Descriptor and the Media Object are delivered separately. • InstallNotifyURI element is included in the Dowload Descriptor for sending the server the Install Notification. • DownloadNotifyURI is included in the Dowload Descriptor for sending the server the Download Notification. • The server MUST include both objectID and objectVersion elements in the mediaObject element of the DD.
Test Procedure	1. The terminal has to know (left to implementation) that a new version of the Media Object is available into the server. 2. The terminal notifies the user that the version available is newer than the version installed. 3. User confirms donwload/update. 4. The terminal (Download Agent) begins to retrieve the Media Object if there is enough memory available. 5. The download fails (i.e., lack of coverage).
Pass-Criteria	1. The terminal notifies the user the newer version of the Media Object. 2. The client can choose to retrieve the Media Object. 3. There is no updating of the Media Object because of a failure in the downloading process. 4. The server must be notified with a “Loss of Service” message.

Table 34: Updating Media Object fails DL-OTA-2.0-con-407

5.2.4.7.1 Test Content

InstallNotifyURI element is included in the Dowload Descriptor

DownloadNotifyURI is included in the Dowload Descriptor

Both objectID and objectVersion elements in the mediaObject element of the DD

5.2.4.8 Status report mechanism (Unsuccessful Notification – Non-Acceptable Content)

Test Case Id	DL-OTA-2.0-con-408
Test Object	Client
Test Case Description	Verify whether status report mechanism is processed properly in case of an unsuccessful installation This is done by checking Status Report delivery in case of unknown media object type.
Specification Reference	[DLOTAv2-TS] Chapter 5.3
SCR Reference	DLOTA-C-026 (M)
Tool	none
Test code	none
Preconditions	• The client device must be able to download the download descriptor. • The TYPE field in the download descriptor indicates an unknown media object type (e.g. something gibberish).
Test Procedure	1. The User selects a URI that points to a download descriptor in a download server. 2. The Download server delivers the download descriptor to the client. The download descriptor includes an InstallNotifyURI attribute and an URI that references the media object. 3. The Client retrieves the media object file from the download server
Pass-Criteria	1. The download descriptor is delivered successfully. 2. The Download Agent understands that the upcoming media object is not supported aborts the download and sends error code “(952) Device Aborted”. OR 3. The download agent downloads the media object. The download agent fails to install the media object and send the error code "(953) Non-Acceptable content".

Table 35: Status report mechanism (Unsuccessful Notification – Non-Acceptable Content) DL-OTA-2.0-con-408

5.2.4.8.1 Test Content

DD contains: <type>gibberish</type>

5.2.4.9 Status report mechanism (Unsuccessful Notification – Attribute Mismatch)

Test Case Id	DL-OTA-2.0-con-409
Test Object	Client
Test Case Description	Verify whether the Download Agent is able to reject a downloaded Media Object with non-compatible format or extension.
Specification Reference	[DLOTAv2-TS] Chapter 5.3.1
SCR Reference	DLOTA-C-026 (M)
Tool	None
Test code	None
Preconditions	• The Media Object MUST BE executable content (ie., content that needs to be installed or rendered to be used). • The advertised content-type of the Media Object MUST be supported by the Device. • The format of the Media Object MUST BE non-usable with the application in the Device that MUST execute the Media Object. • For example, a given Media Object claims to be a JPEG file (“file.jpg”) and claims to use the proper content-type (“image/jpeg”) so it is accepted by the Device because it has the proper codecs. But that same Media Object is in fact a GIF file (i.e. it uses the encoding used in GIF files) so it will not be usable by the application trying to render a JPEG file from GIF content. • InstallNotifyURI element is included in the Download Descriptor for sending the Server the Install Notification. • The Server MUST include both objectID and objectVersion elements in the mediaObject element of the Download Descriptor.
Test Procedure	1. The User decides to retrieve a new Media Object. 2. The Download Agent retrieves the Media Object if there is enough memory available. 3. User verifies that the Media Object is successfully retrieved. 4. User tries to install the new version of the Media Object.
Pass-Criteria	1. The User can choose to retrieve the Media Object. 2. An Installation Notification is received in the Server with the status “Attribute Mismatch”.

Table 36: Status report mechanism (Unsuccessful Notification – Attribute Mismatch) DL-OTA-2.0-con-409

5.2.4.9.1 Test Content

- E.g GIF file named as a JPG file.
- InstallNotifyURI element is included in the Download Descriptor
- both objectID and objectVersion elements in the mediaObject element of the Download Descriptor

5.2.4.10 Proper formatting of Download Descriptor (Invalid Descriptor)

Test Case Id	DL-OTA-2.0-con-410
Test Object	Client
Test Case Description	Verify whether Download Descriptor is formatted properly
Specification Reference	[DLOTAv2-TS] Chapter 7, 7.2
SCR Reference	DLOTA-C-045 (M), DLOTA-C-046 (M)
Tool	none
Test code	none
Preconditions	• The client device must be able to download the download descriptor. • The download descriptor contains syntactic errors e.g. o Some of the mandatory attributes are missing (e.g. Type). o The DD file does not comply with the XML Schema (e.g. there are end tags without start tags)
Test Procedure	1. The User selects a URI that points to a download descriptor in a download server. 2. The Download server delivers the download descriptor to the client. The download descriptor includes an InstallNotifyURI attribute and an URI that references the media object. 3. The Client may attempt to retrieve the media object file from the download server.
Pass-Criteria	1. The download descriptor is delivered successfully. 2. The client sends Installation Notification with errors status “906 Invalid descriptor” to the download server. This event may occur before or after retrieval of the media object. The media object is not made available to the user.

Table 37: Proper formatting of Download Descriptor (Invalid Descriptor) DL-OTA-2.0-con-410

5.2.4.10.1 Test Content

The DD is invalid (“Type” tag is missing and the start tag missing)

5.2.4.11 Progressive download is not available or supported

Test Case ID	DL-OTA-2.0-con-411
Test Object	Client
Test Case Description	To check if the terminal can not start the rendering of the Media Object while the Media Objects is not completed
Specification Reference	[DLOTAv2-TS] Section 7.2.3.3.7 [DLOTAv2-AD] Section 6.15
SCR Reference	DLOTA-C-048 (O)
Tool	None
Test Code	None
Preconditions	• Progressive download is not supported by the device. • The Media Object has to be completly downloaded to render. • The progressiveDownloadFlag is set to a true value. • The Dowload Descriptor and the Media Object are delivered separately. • InstallNotifyURI element is included in the Dowload Descriptor for sending the server the Install Notification. • DownloadNotifyURI is included in the Dowload Descriptor for sending the server the Download Notification. • The server MUST include both objectID and objectVersion elements in the mediaObject element of the DD.
Test Procedure	1. The user browses a new Media Object and decides to retrieve it. 2. The terminal (Donwload Agent) begins the downloading of the Media Objet. 3. The terminal does not start to render the Media Object. 4. The terminal notifies the user that the Media Object is succesfully stored. 5. (optional) Client installs the Media Object.
Pass-Criteria	1. The terminal (Donwload Agent) starts to fetch the Media Object. 2. The terminal does NOT start to render the Media Object (before it is fully downloaded). 3. The terminal notifies the user that the donwload process was succesful. 4. A Download Completion Notification is received in the server when the Media Object is downloaded to the client.

Table 38: Progressive download is not available or supported DL-OTA-2.0-con-411

5.2.4.11.1 Test Content

The progressiveDownloadFlag is set to a true value

InstallNotifyURI element is included in the Dowload Descriptor

DownloadNotifyURI is included in the Dowload Descriptor

Both objectID and objectVersion elements in the mediaObject element of the DD

5.2.4.12 Environment Element

Test Case Id	DL-OTA-2.0-con-412
Test Object	Client
Test Case Description	Verify whether the Environment element to the User is processed properly.
Specification Reference	[DLOTAv2-TS] Chapter 7.2.3.2.10
SCR Reference	DLOTA-C-047 (O) (DLOTA-S-031 (O))
Tool	None
Test code	None
Preconditions	• The `environment` element is included in the Download Descriptor. • The `envtype` unambiguously identifies the information set that can be included inside the `environment` element and the content handler of the Media Object. • The possible values of `envtype`, syntax and semantics of the internal meta data structures depend on separate environment specific standards • The content handler is unknown for the Client, this is, the Client is not able to use the specified environment. • `installNotifyURI` element is present is the Download Descriptor)
Test Procedure	2. The Download Agent retrieves the Download Descriptor from the Download Server. 3. The Download Agent checks whether the `environment` element is included or not.
Pass-Criteria	1. As the content handler is unknown for the Client, it SHOULD abort the download transaction and post an "Envtype not supported" status report to the Server.

Table 39: Environment Element DL-OTA-2.0-con-412

5.2.4.12.1 Test Content

The environment element is included in the Download Descriptor.

The `envtype` unambiguously identifies the information set that can be included inside the `environment` element and the content handler of the Media Object.

`installNotifyURI` element is present is the Download Descriptor

5.2.4.13 MIDP Extension – Installation not possible

Test Case Id	DL-OTA-2.0-con-413
Test Object	Client
Test Case Description	Verify whether the MIDP JAD is wrapped and processed properly using the environment element.
Specification Reference	[DLOTAv2-TS] Chapter 10
SCR Reference	DLOTA-C-060 (O) (DLOTA-S-039 (O))
Tool	None
Test code	None
Preconditions	• `The environment` element is included in the Download Descriptor. • The `envtype` attribute of the environment element is supported by the Download Agent. • The `envtype` unambiguously identifies the information set that can be included inside the environment element and the content handler of the Media Object. • The possible values of `envtype`, syntax and semantics of the internal meta data structures depend on separate environment specific standards. • The retrieval of all associated licenses is already done. • `installNotifyURI` element is present in the Download Descriptor. • The Device supports the use of the `environment` element but it does NOT support the installation of MIDP Content.
Test Procedure	1. The Download Agent retrieves the Download Descriptor from the Download Server.
Pass-Criteria	1. As the MIDP AMS is not capable to install the MIDlet, the Download Agent MUST terminate the download session and it MUST post an "Environment Internal Status" report with the status report received from the MIDP AMS. 2. Both the Download Agent and MIDP AMS MUST NOT request any User input.

Table 40: MIDP Extension – Installation not possible DL-OTA-2.0-con-413

5.2.4.13.1 Test Content

The environment element is included in the Download Descriptor

`installNotifyURI` element is present in the Download Descriptor

5.3 Server

5.3.1 Client advertises support for DD1 only

Test Case Id	DL-OTA-2.0-con-501
Test Object	Server
Test Case Description	Verify that the Server will use the highest version advertised by Client when the server supports a higher version than the client.
Specification Reference	[DLOTAv2-TS] Chapter 11
SCR Reference	DLOTA-S-040 (O)
Tool	None
Test code	None
Preconditions	• The Server supports both DLOTA v1 and DLOTAv2 • The server supports the feature to adjust to the version of DLOTA advertised by the client • The test Client supports only DLOTA v1 • The test Client advertises support for only DLOTA v1
Test Procedure	1. The test client advertises DLOTAv1 and tries to download a DD from the Server. 2. The Download Server delivers a v1 DD 3. The User confirms the download of the Media Object.
Pass-Criteria	1. The Server receives the request and delivers a Download Descriptor for DLOTAv1. 2. The test client requests the Media Object. 3. The Server receives the request and delivers the Media Object.

Table 41: Client advertises support for DD1 only DL-OTA-2.0-con-501

5.3.1.1 Test Content

Client request advertises DLOTA 1.0 only (NOT DLOTA 2.0)

5.3.2 Transport Content Type parameter notifies the DD Media Type

Test Case Id	DL-OTA-2.0-con-502
Test Object	Server
Test Case Description	Verify whether the Download Descriptor media type is properly advertised by the server as a Content Type in the transport protocol. This is done by checking the HTTP headers, when using HTTP as the transport protocol.
Specification Reference	[DLOTAv2-TS] Chapter 5.1.1
SCR Reference	DLOTA-S-009 (M)
Tool	**protocol analysis tool**
Test code	none
Preconditions	• The Server uses HTTP as a transport protocol when communicating with the Client. • A protocol analysis tool is available and it is possible to analyse the traffic between server and client.
Test Procedure	1. The User selects a URI that points to a download descriptor in a download server. 2. A protocol analysis tool is set up to trace the communication between server and client. 3. The Download server delivers the download descriptor to the client. 4. The headers of the response message (from server to client) is analysed
Pass-Criteria	1. The HTTP header: “Content-Type” is present and has the value: `application/vnd.oma.dd2+xml`

Table 42: Transport Content Type parameter notifies the DD Media Type DL-OTA-2.0-con-502

5.3.2.1 Test Content

None

5.3.3 Proper formatting of Download Descriptor

Test Case Id	DL-OTA-2.0-con-503
Test Object	Server
Test Case Description	Verify whether Download Descriptor is formatted properly This is done by analyzing the XML code and verifying that all mandatory fields are present.
Specification Reference	[DLOTAv2-TS] Chapter 7, 7.2
SCR Reference	DLOTA-S-029 (M), DLOTA-S-030 (M)
Tool	Tool to verify the DD against the XML Schema ("Download Descriptor Schema", Open Mobile Alliance™, OMA-SUP-XSD_dd-V2_0. http://www.openmobilealliance.org/)
Test code	none
Preconditions	None
Test Procedure	1. The server is stimulated to send a Download Descriptor for a simple Media Object 2. The Download descriptor is analyzed
Pass-Criteria	1. The Download Descriptor is valid according to the XML schema 2. All mandatory elements are present. These are: 2.1 `DDVersion` 2.2 `Product` 2.3 `Size` 2.4 `Type` 2.5 `objectURI` 2.6 `server`

Table 43: Proper formatting of Download Descriptor DL-OTA-2.0-con-503

5.3.3.1 Test Content

None

6. Interoperability Test Cases

6.1 Backwards Compatibility

6.1.1 Separate Delivery with v1.0 DD without Status Report

Test Case Id	DL-OTA-2.0-int-001
Test Object	Client and Server
Test Case Description	Verify support for DLOTA v1.0 for backwards compatibility. This is done by attemting to access a DD with version 1.0 on the server and retrieving the corresponding media object. The DD is downloaded separately from the media and does NOT contain a request for Installation Notification.
Specification Reference	[DLOTAv2-TS] Chapter 11
SCR Reference	DLOTA-C-061 (M) DLOTA-S-040 (O)
Tool	none
Test code	none
Preconditions	The Server contains a Download Descriptor for DLOTA v1.0
Test Procedure	1. The user selects a URI that points to a download descriptor (DD) on a download server. 2. The Client tries to retrieve the v1.0 DD. 3. The Download Server delivers v1.0 DD 4. The Client parses the DD. The download descriptor includes an URI that references the media object. The download descriptor does not include InstallNotifyURI 5. The Client retrieves the corresponding Media file 6. The Download Server delivers the media file 7. The Client receives the media file and installs the media object
Pass-Criteria	1. The Client does not send Installation Notification as a result of the installation. The client releases the media object for use. 2. The Server reports no error

Table 44: Separate Delivery with v1.0 DD without Status Report DL-OTA-2.0-int-001

6.1.2 Separate Delivery with v1.0 DD with Status Report

Test Case Id	DL-OTA-2.0-int-002
Test Object	Client and Server
Test Case Description	Verify support for DLOTA v1.0 for backwards compatibility. This is done by attemting to access a DD with version 1.0 on the server and retrieving the corresponding media object. The DD is downloaded separately from the media and contains a request for Installation Notification.
Specification Reference	[DLOTAv2-TS] Chapter 11
SCR Reference	DLOTA-C-061 (M) DLOTA-S-040 (O)
Tool	none
Test code	none
Preconditions	The Server contains a Download Descriptor for DLOTA v1.0
Test Procedure	1. The user selects a URI that points to a download descriptor (DD) on a download server. 2. The Client tries to retrieve the v1.0 DD. 3. The Download Server delivers v1.0 DD 4. The Client parses the DD. The download descriptor includes an URI that references the media object. The download descriptor includes InstallNotifyURI 5. The Client retrieves the corresponding Media file 6. The Download Server delivers the media file 7. Client receives the media file and installs the media object 8. The Client sends the Installation notification 9. Server receives the Installation Notification 10. Download server acknowledges the Installation Notification with HTTP 200 series response code
Pass-Criteria	1. The Client is able to retrieve the media and makes it available to the user 2. The Server reports no error

Table 45: Separate Delivery with v1.0 DD with Status Report DL-OTA-2.0-int-002

6.1.3 Combined Delivery with v1.0 DD with Status report

Test Case Id	DL-OTA-2.0-int-003
Test Object	Client and Server
Test Case Description	Verify support for DLOTA v1.0 for backwards compatibility. This is done by attemting to access a DD with version 1.0 on the server and retrieving the corresponding media object. The DD and the media are downloaded in a combined delivery. The DD contains a request for Installation Notification.
Specification Reference	[DLOTAv2-TS] Chapter 11
SCR Reference	DLOTA-C-061 (M) DLOTA-S-040 (O)
Tool	none
Test code	none
Preconditions	The Server contains a Download Descriptor for DLOTA v1.0
Test Procedure	1. The user selects a URI that points to a download descriptor (DD) on a download server. 2. The Client tries to retrieve the v1.0 DD/Media file. 3. The Server delivers the combined file with a DD with v1.0 and the orresponding Media file 4. The Client parses the file and sends an Installation notification 5. The Server receives the Installation Notification 6. Download server acknowledges the Installation Notification with HTTP 200 series response code
Pass-Criteria	1. The Client is able to retrieve the media and makes it available to the user 2. The Server reports no error

Table 46: Separate Delivery with v1.0 DD with Status Report DL-OTA-2.0-int-003

6.1.4 Client advertises support for DD1 and DD2

Test Case Id	DL-OTA-2.0-int-004
Test Object	Client and Server
Test Case Description	Verify that the Server will use the highest version advertised by Client.
Specification Reference	[DLOTAv2-TS] Chapter 11
SCR Reference	DLOTA-C-061 (M) DLOTA-S-040 (O)
Tool	None
Test code	None
Preconditions	• The Server supports both DLOTA v1 and DLOTAv2 • The Client supports both DLOTA v1 and DLOTAv2 • The Client advertises support for both DLOTA v1 and DLOTAv2
Test Procedure	1. The User decides to retrieve a new Media Object. 2. The Download Server delivers a v2 DD 3. The User confirms the download of the Media Object.
Pass-Criteria	1. The Server receives the request and delivers a Download Descriptor for DLOTAv2. 2. The Download Agent requests the Media Object. 3. The Server receives the request and delivers the Media Object.

Table 47: Client advertises support for DD1 and DD2 DL-OTA-2.0-int-004

6.2 Download Process

6.2.1 Separate Delivery with Status Report (Install Notify)

Test Case Id	DL-OTA-2.0-int-101
Test Object	Client and Server
Test Case Description	Verify "normal" download of single media Object, with status report. This is done by attempting to access a DD on the server and retrieving the corresponding media object. The DD is downloaded separately from the media and contains a request for Installation Notification.
Specification Reference	[DLOTAv2-TS] Chapter 5
SCR Reference	DLOTA-C-001 (M) DLOTA-S-001 (M)
Tool	none
Test code	none
Preconditions	• The download descriptor includes InstallNotifyURI
Test Procedure	1. The user selects a URI that points to a download descriptor (DD) on a download server. 2. The Client tries to retrieve the DD. 3. The Download Server delivers DD 4. The Client parses the DD. The download descriptor includes an URI that references the media object. 5. The Client retrieves the corresponding Media file 6. The Download Server delivers the media file 7. Client receives the media file and installs the media object 8. The Client sends the Installation notification
Pass-Criteria	1. The Client is able to retrieve the media and makes it available to the user 2. The Download server receives the Installation Notification and acknowledges it with HTTP 200 series response code 3. The Server reports no error

Table 48: Separate Delivery with Status Report DL-OTA-2.0-int-101

6.2.2 Co-Delivery of DD and Media Objects

Test Case Id	DL-OTA-2.0-int-102
Test Object	Client and Server
Test Case Description	Verify whether co-delivery of Download Descriptor and Media Objects is processed properly
Specification Reference	[DLOTAv2-TS] Chapter 5.1.1.1
SCR Reference	DLOTA-C-012 (O) DLOTA-S-011 (O)
Tool	None
Test code	None
Preconditions	• The Dowload Descriptor and the Media Object are co-delivered. • InstallNotifyURI element is included in the Download Descriptor for sending the Server the Install Notification. • DownloadNotifyURI is included in the Download Descriptor for sending the Server the Download Notification. • The Server MUST include both objectID and objectVersion elements in the mediaObject element of the DD.
Test Procedure	1. The User browses a Media Object using a Browser (left to the implementation). 2. User confirms the download of the Media Object. 3. The Download Descriptor and the Media Object are sent at the same time. 4. The Download Agent checks the capabilities of the device. 5. The User is offered the option of installing the Media Object. 6. The User accepts to install the Media Object. 7. The Download Agent sends an Install-Notification to the Server.
Pass-Criteria	1. The Download Descriptor and the Media Object are receveived successfully at the same time. 2. A Download Completion Notification is received in the Server. 3. The Download Agent successfully checks the capabilities of the device to install the Media Object. 4. The Media Object is succesfully installed in the device. 5. The Server receives a Installation-Notification.

Table 49: Co-Delivery of DD and Media Objects DL-OTA-2.0-int-102

6.2.3 Separate Delivery without Status Report

Test Case Id	DL-OTA-2.0-int-103
Test Object	Client and Server
Test Case Description	Verify whether the Download Descriptor and the Media Objects are downloaded separately. This is done by attemting to access a DD on the server and retrieving the corresponding media object. The DD is downloaded separately from the media and does NOT contain a request for Installation Notification.
Specification Reference	[DLOTAv2-TS] Chapter 5
SCR Reference	DLOTA-C-001 (M) DLOTA-S-001 (M)
Tool	none
Test code	none
Preconditions	none
Test Procedure	1. The user selects a URI that points to a download descriptor (DD) on a download server. 2. The Client tries to retrieve the DD. 3. The Download Server delivers DD 4. The Client parses the DD. The download descriptor includes an URI that references the media object. The download descriptor does not include InstallNotifyURI 5. The Client retrieves the corresponding Media file 6. The Download Server delivers the media file 7. The Client receives the media file and installs the media object
Pass-Criteria	1. The Client does not send Installation Notification as a result of the installation. The client releases the media object for use. 2. The Server reports no error

Table 50: Separate Delivery without Status Report DL-OTA-2.0-int-103

6.2.4 Separate Delivery with Status Report (Download Notify)

Test Case Id	DL-OTA-2.0-int-104
Test Object	Client and Server
Test Case Description	Verify whether the Download Descriptor and the Media Objects are downloaded separately. This is done by attemting to access a DD on the server and retrieving the corresponding media object. The DD is downloaded separately from the media and contains a request for Download Notification.
Specification Reference	[DLOTAv2-TS] Chapter 5
SCR Reference	DLOTA-C-001 (M) DLOTA-S-001 (M)
Tool	none
Test code	none
Preconditions	The download descriptor includes DownloadNotifyURI
Test Procedure	1. The user selects a URI that points to a download descriptor (DD) on a download server. 2. The Client tries to retrieve the DD. 3. The Download Server delivers DD 4. The Client parses the DD. The download descriptor includes an URI that references the media object. The download descriptor includes InstallNotifyURI 5. The Client retrieves the corresponding Media file 6. The Download Server delivers the media file 7. Client receives the media file 8. The Client sends the Download notification
Pass-Criteria	1. The Client is able to retrieve the media and makes it available to the user 2. The Download server receives the Download Notification and acknowledges it with HTTP 200 series response code 3. The Server reports no error

Table 51: Separate Delivery with v1.0 DD with Status Report DL-OTA-2.0-int-104

6.2.5 Dowload a Media Object using (objectID, objectVersion in the DD)

Test Case ID	DL-OTA-2.0-int-105
Test Object	Client and Server
Test Case Description	To test if a Media Object browsed by the user is correctly downloaded.
Specification Reference	[DLOTAv2-TS] Section 5.2.4.2 [DLOTAv2-AD] Section 6.1
SCR Reference	DLOTA-C-019 (O), DLOTA-S-014 (O)
Tool	None
Test Code	None
Preconditions	• The Dowload Descriptor and the Media Object are delivered separately. • InstallNotifyURI element is included in the Dowload Descriptor for sending the server the Install Notification. • DownloadNotifyURI is included in the Dowload Descriptor for sending the server the Download Notification. • The server MUST include both objectID and objectVersion elements in the mediaObject element of the DD.
Test Procedure	1. The user browses a Media Object using a Browser (left to the implementation). 2. User confirms donwload the Media Object. 3. The terminal (Download Agent) retrieves the Media Object if there is enough memory available. 4. User verifies that the Media Object is successfully retrieved. 5. (optional) User installs the new version of the Media Object.
Pass-Criteria	1. The user can select to download the Media Object. 2. A Download Completion Notification is received in the server. 3. If client select to install the Media Object, it is successfully installed, and the server receives a Installation Notification.

Table 52: Dowload a Media Object using (objectID, objectVersion in the DD) DL-OTA-2.0-int-105

6.2.6 Timing Reservation

Test Case ID	DL-OTA-2.0-int-106
Test Object	Client and Server
Test Case Description	To test if the user can make reservations (i.e. the time) for downloading a Media Object and perform the downloading afterwards.
Specification Reference	[DLOTAv2-TS] Section 5.2.4.1 [DLOTAv2-AD] Section 6.13
SCR Reference	DLOTA-C-018 (O), DLOTA-S-013 (O)
Tool	None
Test Code	None
Preconditions	• The Download Server has capability of time management functionality, and it gives a list of candidate time for downloading. • The Dowload Descriptor and the Media Object are delivered separately. • InstallNotifyURI element is included in the Dowload Descriptor for sending the Content Portal the Install Notification. • DownloadNotifyURI is included in the Dowload Descriptor for sending to every server the Download Notification. • The server MUST include both objectID and objectVersion elements in the mediaObject element of the DD. • The server includes the donwloadTime element in the DD.
Test Procedure	1. The user browses a Media Objects and decides to retrieve it. 2. The User may select the candidate time from a list giving by the server. 3. The terminal (Download Agent) initiates downloading automatically when the reserved time passes. 4. User verifies that the Media Object is successfully retrieved. 5. (optional) User installs the new version of the Media Object.
Pass-Criteria	1. The terminal gives the user the candidate time list. 2. The User can choose any candidate time from a list. 3. The time that the download starts is the time that was set by the user. 4. A Download Completion Notification is received in the server when the Media Object is downloaded to the client.

Table 53: Timing Reservation DL-OTA-2.0-int-106

6.2.7 Download Agent sets the time automatically

Test Case ID	DL-OTA-2.0-int-107
Test Object	Client and Server
Test Case Description	To test if the Media Objects is downloaded if the terminal (Download Agent) sets the time automatically.
Specification Reference	[DLOTAv2-TS] Section 5.2.4.1 [DLOTAv2-AD] Section 6.13
SCR Reference	DLOTA-C-018 (O), DLOTA-S-013 (O),
Tool	None
Test Code	None
Preconditions	• The Download Server has capability of time management functionality, and it gives a list of candidate time for downloading. • The Dowload Descriptor and the Media Object are delivered separately. • InstallNotifyURI element is included in the Dowload Descriptor for sending the Content Portal the Install Notification. • DownloadNotifyURI is included in the Dowload Descriptor for sending to every server the Download Notification. • The server MUST include both objectID and objectVersion elements in the mediaObject element of the DD. • The server includes the donwloadTime element in the DD.
Test Procedure	1. The user browses a Media Objects and decides to retrieve it. 2. The Donwload Agent receives the candidate time list from the Server and set automatically any time, without request to the user. 3. The Download Agent initiates downloading automatically when the reserved time passes. 4. User verifies that the Media Object is successfully retrieved. 5. (optional) User installs the new version of the Media Object.
Pass-Criteria	1. The terminal does not give the user the candidate time list. 2. The download starts without the user selection at the time set by the Donwload Agent. 3. The terminal notifies the user that the donwload process was succesful. 4. A Download Completion Notification is received in the server when the Media Object is downloaded to the client.

Table 54: Download Agent sets the time automatically DL-OTA-2.0-int-107

6.2.8 Download Agent is not able to execute Transaction at designated time

Test Case ID	DL-OTA-2.0-int-108
Test Object	Client and Server
Test Case Description	To test if the Media Objects is not downloaded if the terminal (Download Agent) is switched off and the server is reported with the status.
Specification Reference	[DLOTAv2-TS] Section 5.2.4.1 [DLOTAv2-AD] Section 6.13
SCR Reference	DLOTA-C-018 (O) DLOTA-S-013 (O),
Tool	None
Test Code	None
Preconditions	• The Download Server has capability of time management functionality, and it gives a list of candidate time for downloading. • The Dowload Descriptor and the Media Object are delivered separately. • InstallNotifyURI element is included in the Dowload Descriptor for sending the Content Portal the Install Notification. • DownloadNotifyURI is included in the Dowload Descriptor for sending to every server the Download Notification. • The server MUST include both objectID and objectVersion elements in the mediaObject element of the DD. • The server includes the donwloadTime element in the DD and the reservationNotifyURI.
Test Procedure	1. The user browses a Media Objects and decides to retrieve it. 2. The Donwload Agent receives the candidate time list from the Server and the user may select the candidate time from the list. 3. The user swithces off the terminal before the time that was set up.
Pass-Criteria	1. The terminal gives the user the candidate time list. 2. Tue user may choose any time from the list. 3. A “Loss of Service” Notification is received in the server when the atumatic downlaoding sould start. 4. A “Reservation Error” value must be posted in the reservationNotifyURI.

Table 55 Download Agent is not able to execute Download at designated time DL-OTA-2.0-int-108

6.2.9 Media Object has been replaced before download in time reservation

.

Test Case ID	DL-OTA-2.0-int-109
Test Object	Client and Server
Test Case Description	To test if the user if can choose to download the Media Object even it has been replaced.
Specification Reference	[DLOTAv2-TS] Section 5.2.4.1 [DLOTAv2-AD] Section 6.13
SCR Reference	DLOTA-C-018 (O) DLOTA-S-013 (O)
Tool	None
Test Code	None
Preconditions	• The Download Server has capability of time management functionality, and it gives a list of candidate time for downloading. • The Media Object is updated in the server between the user request and the time selected to downlaod.
Test Procedure	1. The user browses a Media Objects and decides to retrieve it. 2. The User may select the candidate time from a list giving by the server. 3. The Download Agent initiates downloading automatically when the reserved time passes. 4. The Terminal gives the user the option to download the Media Object which has been updated after the early request. 5. User selects to retrieve the Media Object. 6. User verifies that the Media Object is successfully retrieved. 7. (optional) User installs the new version of the Media Object.
Pass-Criteria	1. The terminal gives the user the candidate time list. 2. The download starts at the time set by the Donwload Agent. 3. The terminal gives the user the option to retrieve the new version of the Media Object selected. 4. The terminal notifies the user that the donwload process was succesful. 5. A Download Completion Notification is received in the server when the Media Object is downloaded to the client.

Table 56: Media Object has been replaced before download in time reservation DL-OTA-2.0-int-109

6.2.10 Media Object Update using object ID and object Version

Test Case ID	DL-OTA-2.0-int-110
Test Object	Client and Server
Test Case Description	To test if a Media Object already stored on the client device is correctly updated.
Specification Reference	[DLOTAv2-TS] Section 5.2.4 [DLOTAv2-AD] Section 6.4
SCR Reference	DLOTA-C-019 (O), DLOTA-S-014 (O)
Tool	None
Test Code	None
Preconditions	• A new version of the Media Object has to be available in to the server. • The Dowload Descriptor and the Media Object are delivered separately. • InstallNotifyURI element is included in the Dowload Descriptor for sending the server the Install Notification. • DownloadNotifyURI is included in the Dowload Descriptor for sending the server the Download Notification. • The server MUST include both objectID and objectVersion elements in the mediaObject element of the DD.
Test Procedure	1. The terminal has to know (left to implementation) that a new version of the Media Object is available into the server. 2. The terminal notifies the user that the version available is newer than the version installed. 3. User confirms donwload/update. 4. The terminal (Download Agent) retrieves the Media Object if there is enough memory available. 5. User verifies that the Media Object is successfully retrieved. 6. (optional) User installs the new version of the Media Object.
Pass-Criteria	1. The terminal notifies the user the newer version of the Media Object. 2. The client can choose to retrieve the Media Object. 3. A Download Completion Notification is received in the server. 4. If client select to install the Media Object, it is successfully installed, and the server receives a Installation Notification.

Table 57: Media Object update using objectID and objectVersion DL-OTA-2.0-int-110

6.2.11 Updating media object with co-delivery of DD and Media Obejct

Test Case ID	DL-OTA-2.0-int-111
Test Object	Client and Server
Test Case Description	To test if a Media Object already stored on the client device is correctly updated, in a co-delivery manner.
Specification Reference	[DLOTAv2-TS] Section 5.1.1.1 [DLOTAv2-AD] Section 6.3
SCR Reference	DLOTA-C-012 (O), DLOTA-S-011 (O)
Tool	None
Test Code	None
Preconditions	• A new version of the Media Object has to be available in to the server. • The Dowload Descriptor and the Media Object are deliveried in a combined manner. • InstallNotifyURI element is included in the Dowload Descriptor for sending the server the Install Notification. • DownloadNotifyURI is included in the Dowload Descriptor for sending the server the Download Notification. • The server SHOULD include the ETag element in DD and the client agent MAY support this perform.
Test Procedure	1. The terminal has to know (left to implementation) that a new version of the Media Object is available into the server. 2. The terminal notifies the user that the version available is newer than the version installed. 3. User confirms donwload/update. 4. The terminal (Download Agent) retrieves the Media Object if there is enough memory available. 5. User verifies that the Media Object is successfully retrieved. 6. (optional) User installs the new version of the Media Object.
Pass-Criteria	1. The terminal notifies the user the newer version of the Media Object. 2. The client can choose to retrieve the Media Object. 3. A Download Completion Notification is received in the server. 4. If client select to install the Media Object, it is successfully installed, and the server receives a Installation Notification.

Table 58: Updating media object with co-delivery of DD and Media Obejct DL-OTA-2.0-int-111

6.2.12 Multiple Media Objects grouped as a Product

Test Case Id	DL-OTA-2.0-int-112
Test Object	Client and Server
Test Case Description	Verify whether multiple Media Objects grouped as a Product are processed properly This is done by attempting to retrieve a set of 10 Media Objects that are referenced as a Product in one DD.
Specification Reference	[DLOTAv2-TS] Chapter 5
SCR Reference	DLOTA-C002 (O) DLOTA-S-002 (M)
Tool	None
Test code	None
Preconditions	• The Content Portal creates the Download Descriptor for the Product Object, with 10 Media Objects • The Download Descriptor and the Media Object are delivered separately. • InstallNotifyURI element is included in the Download Descriptor • the installNotifyURI has been defined for the whole Product and not for one of the Media Objects
Test Procedure	1. The User selects a URI that points to a download descriptor in a download server. 2. The Download server delivers the download descriptor to the client. 3. The Product is downloaded and the device should try to install all Media Objects within the Product 4. The status report for the Product is sent to the server.
Pass-Criteria	1. A single Installation Notification is sent to the server 2. The installation notification is not sent before all Media Objects are processed

Table 59: Multiple Media Objects grouped as a Product DL-OTA-2.0-int-112

6.2.13 Multiple Media Objects grouped as a Compound Product

Test Case ID	DL-OTA-2.0-int-113
Test Object	Client and Server
Test Case Description	To test the downloading of some Media Objects in the same OTA session from different sources.
Specification Reference	[DLOTAv2-TS] Section 5 [DLOTAv2-AD] Section 6.8
SCR Reference	DLOTA-C-003 (O), DLOTA-S-003 (M)
Tool	None
Test Code	None
Preconditions	• The Content Portal creates the Donwload Descriptor for the Compound Object, with several Media Objects of different types. • The user does not mind that the object is compound. • The Dowload Descriptor and the Media Object are delivered separately. • InstallNotifyURI element is included in the Dowload Descriptor for sending the Content Portal the Install Notification. • DownloadNotifyURI is included in the Dowload Descriptor for sending to every server the Download Notification. • The conent portal MUST include both objectID and objectVersion elements in the mediaObject element of the DD.
Test Procedure	1. The user browses a new Media Object (Compound Object) and decides to retrieve it. 2. The terminal (Download Agent) begins to retrieve the Media Object if there is enough memory available. 3. User verifies that the Media Object is successfully retrieved. 4. The terminal (Download Agent) performs specific actions based upon the nature of the components of the Compound Object (install if it is an application, play if it is a media file, etc).
Pass-Criteria	1. The user can choose to download a Media Object that is a Compound Object. 2. The terminal retrieves correctly the Media Object and gives the user the option to perform an specific action with it. 3. A Download Completion Notification is received in each server.

Table 60: Multiple Media Objects grouped as a Compound Product DL-OTA-2.0-int-113

6.2.14 Multiple Products

Test Case Id	DL-OTA-2.0-int-114
Test Object	Client and Server
Test Case Description	Verify whether multiple Products are processed properly This is done by attempting to retrieve several Products, each containing a set of Media Objects that are referenced as a Product in a single DD.
Specification Reference	[DLOTAv2-TS] Chapter 5
SCR Reference	DLOTA-C004 (O) DLOTA-S-004(M)
Tool	None
Test code	None
Preconditions	• The Server contains a Download Descriptor with at least 2 Products, each containing several Media Objects • The Download Descriptor and the Media Object are delivered separately. • InstallNotifyURI element is included in the Download Descriptor, for each Product • the installNotifyURI has been defined for the whole Products and not for one of the Media Objects within the Products
Test Procedure	1. The User selects a URI that points to a download descriptor in a download server. 2. The Download server delivers the download descriptor to the client. 3. The Product is downloaded and the device should try to install all Media Objects within each Product 4. The status reports for the Products are sent to the server.
Pass-Criteria	1. An Installation Notification is sent to the server for each Product.(i.e. at least 2 notifications should be sent by the client) 2. The installation notification for each Product is not sent before all Media Objects of that Product are processed

Table 61: Multiple Products DL-OTA-2.0-int-114

6.2.15 Multiple Objects

Test Case ID	DL-OTA-2.0-int-115
Test Object	Client device
Test Case Description	To test if multiple Media Objects can be downloaded in the same OTA session from different sources.
Specification Reference	[DLOTAv2-TS] Section 5 [DLOTAv2-AD] Section 6.7
SCR Reference	DLOTA-C-002 (O) DLOTA-S-002 (M),
Tool	None
Test Code	None
Preconditions	• The Content Portal knows where are hosted each Media Object. • The Content Portal creates the Donwload Descriptor for the Compound Object, with several Media Objects from different Donwload Servers. • The Dowload Descriptor and the Media Object are delivered separately. • InstallNotifyURI element is included in the Dowload Descriptor for sending the Content Portal the Install Notification. • DownloadNotifyURI is included in the Dowload Descriptor for sending to every server the Download Notification. • The conent portal MUST include both objectID and objectVersion elements in the mediaObject element of the DD.
Test Procedure	1. The user browses some Media Objects (Multiple Object) and decides to retrieve them. 2. The terminal (Download Agent) begins to retrieve each Media Objects separately, if there is enough memory available. 3. The Download Agent performs specific actions based upon the nature of the component of each Media Object (i.e. giving the user the chance to install some of the Media Objects). 4. The process continues until the last Media Object is retrieved.
Pass-Criteria	1. The user can choose to download correctly some Multiple Media Objects that exist in diferent servers. 2. The terminal retrieves correctly each Media Object and gives the user the option to perform an specific action with each.. 3. A Download Completion Notification is received in the server when each Media Object is downloaded to the client.

Table 62: Multiple Objects DL-OTA-2.0-int-115

6.2.16 Media object update using Etag

Test Case ID	DL-OTA-2.0-int-116
Test Object	Client and Server
Test Case Description	To test if a Media Object already stored on the client device is correctly updated.
Specification Reference	[DLOTAv2-TS] Section 5.2.4.2 [DLOTAv2-AD] Section 6.4
SCR Reference	DLOTA-C-020 (O), DLOTA-S-015 (O)
Tool	None
Test Code	None
Preconditions	• A new version of the Media Object has to be available in to the server. • The Dowload Descriptor and the Media Object are delivered separately. • InstallNotifyURI element is included in the Dowload Descriptor for sending the server the Install Notification. • DownloadNotifyURI is included in the Dowload Descriptor for sending the server the Download Notification. • The server SHOULD include the ETag element in DD and the client agent MAY support this perform.
Test Procedure	1. The terminal has to know (left to implementation) that a new version of the Media Object is available into the server. 2. The terminal notifies the user that the version available is newer than the version installed. 3. User confirms donwload/update. 4. The terminal (Download Agent) retrieves the Media Object if there is enough memory available. 5. User verifies that the Media Object is successfully retrieved. 6. (optional) User installs the new version of the Media Object.
Pass-Criteria	1. The terminal notifies the user the newer version of the Media Object. 2. The client can choose to retrieve the Media Object. 3. A Download Completion Notification is received in the server. 4. If client select to install the Media Object, it is successfully installed, and the server receives a Installation Notification.

Table 63: Media object update using Etag DL-OTA-2.0-int-116

6.2.17 Chunked Media object retrieval

Test Case Id	DL-OTA-2.0-int-117
Test Object	Client and Server
Test Case Description	Verify whether Chunked Media Object retrieval is processed properly This is done by enabling chunked delivery on a server and verify that the download process is unaffected by this.
Specification Reference	[DLOTAv2-TS] Chapter 5.2.4.4
SCR Reference	DLOTA-C-022 (O) DLOTA-S-017 (O)
Tool	None
Test code	None
Preconditions	• The Server supports (HTTP) Chunked delivery and it is enabled on the server. • InstallNotifyURI element is included in the Download Descriptor, • The Media Object is large enough to warrant the use of Chunked Delivery
Test Procedure	1. The User selects a URI that points to a download descriptor in a download server. 2. The Download server delivers the download descriptor to the client. 3. The Media Object is downloaded and installed 4. The status report is sent to the server.
Pass-Criteria	1. The Media Object is made available to the User 2. An Installation Notification is sent to the server

Table 64: Chunked Media object retrieval DL-OTA-2.0-int-117

6.2.18 Pause and Resume Media Object retrieval - PAUSE

Test Case ID	DL-OTA-2.0-int-118
Test Object	Client and Server
Test Case Description	To test if the user can pause the downloading of the Media Object or if the transaction is interrupted (i.e.lack of coverage).
Specification Reference	[DLOTAv2-TS] Section 5.2.4.3 [DLOTAv2-AD] Section 6.11
SCR Reference	DLOTA-C-021 (O), DLOTA-S-016 (O),
Tool	None
Test Code	None
Preconditions	• The Download Server allows the continuation of an interrupted donwload session. • The Donwload Agent supports resume of a download transaction from the point it was interrupted. • The Dowload Descriptor and the Media Object are delivered separately. • InstallNotifyURI element is included in the Dowload Descriptor for sending the server the Install Notification. • DownloadNotifyURI is included in the Dowload Descriptor for sending the server the Download Notification. • The server MUST include both objectID and objectVersion elements in the mediaObject element of the DD.
Test Procedure	1. The user browses a new Media Object and decides to retrieve it. 2. The terminal (donwload Agent) begins to donwload the media object, if there is enough memory. 3. The user PAUSE the donwload transaction
Pass-Criteria	1. The terminal (Donwload Agent) starts to fetch the Media Object. 2. The downloading is paused when the user selected this option.

Table 65: Resumable Session, Pause and Resume functionality- PAUSE DL-OTA-2.0-int-118

6.2.19 Pause and Resume Media Object retrieval – RESUME

Test Case ID	DL-OTA-2.0-int-119
Test Object	Client and Server
Test Case Description	To test if the user can resume the paused downloading of the Media Object.
Specification Reference	[DLOTAv2-TS] Section 5.2.4.3 [DLOTAv2-AD] Section 6.11
SCR Reference	DLOTA-C-021 (O), DLOTA-S-016 (O),
Tool	None
Test Code	None
Preconditions	• The Download Server allows the continuation of an interrupted donwload session. • The Donwload Agent supports resume of a download transaction from the point it was interrupted. • The Dowload Descriptor and the Media Object are delivered separately. • InstallNotifyURI element is included in the Dowload Descriptor for sending the server the Install Notification. • DownloadNotifyURI is included in the Dowload Descriptor for sending the server the Download Notification. • The server MUST include both objectID and objectVersion elements in the mediaObject element of the DD.
Test Procedure	1. The donwload trasaction was interrupted, and the user decided to RESUME the session.
Pass-Criteria	1. The terminal (Donwload Agent) starts to fetch the Media Object again. 2. The terminal notifies the user that the donwload process was succesful. 3. A Download Completion Notification is received in the server when the Media Object is downloaded to the client.

Table 66: Resumable Session, Pause and Resume functionality- RESUME DL-OTA-2.0-int-119

6.2.20 Server Initiated Automatic Download

Test Case ID	DL-OTA-2.0-int-120
Test Object	Client and Server
Test Case Description	To test if the Download Agent is able to atumatically download the Media Object.
Specification Reference	[DLOTAv2-TS] Section 5.6 [DLOTAv2-AD] Section 6.14
SCR Reference	DLOTA-C-038 (O), DLOTA-S-023 (O),
Tool	None
Test Code	None
Preconditions	• The server device must be able to push the download descriptor through a Push Gateway/Proxy. • The user must subscribe the service that push Media Objects to the terminal. • The Dowload Descriptor and the Media Object are delivered separately. • InstallNotifyURI element is included in the Dowload Descriptor for sending the Content Portal the Install Notification. • DownloadNotifyURI is included in the Dowload Descriptor for sending to the server the Download Notification. • The server MUST include both objectID and objectVersion elements in the mediaObject element of the DD.
Test Procedure	1. The terminal (Download Agent) could notify the user the automatic downloading of a Media Object. 2. If user was notified, can verify that the Media Object is successfully retrieved. 3. (optional) User installs the new version of the Media Object.
Pass-Criteria	1. The user could know that a new Media Object is being downloaded. 2. The terminal notifies the user that the donwload process was succesful. 3. A Download Completion Notification is received in the server when the Media Object is downloaded to the client.

Table 67: Server Initiated Automatic Download DL-OTA-2.0-int-120

6.2.21 Separate Delivery with Status Report over WSP

Test Case Id	DL-OTA-2.0-int-121
Test Object	Client and Server
Test Case Description	Verify "normal" download of single media Object, with status report via WSP. This is done by connecting from the client to the server via WSP and performing a "normal" download.
Specification Reference	[DLOTAv2-TS] Chapter 5.1.1
SCR Reference	DLOTA-C-008 (O) DLOTA-S-007 (O)
Tool	none
Test code	none
Preconditions	• The Server contains a Download Descriptor • The download descriptor includes InstallNotifyURI • The client supports WSP • The client is configured to use a WAP Gateway
Test Procedure	1. The user selects a URI that points to a download descriptor (DD) on a download server. 2. The Client tries to retrieve the DD. 3. The Download Server delivers DD 4. The Client parses the DD. The download descriptor includes an URI that references the media object. 5. The Client retrieves the corresponding Media file 6. The Download Server delivers the media file 7. Client receives the media file and installs the media object 8. The Client sends the Installation notification
Pass-Criteria	1. The Client is able to retrieve the media and makes it available to the user 2. The Download server receives the Installation Notification and acknowledges it with HTTP 200 series response code 3. The Server reports no error

Table 68: Separate Delivery with Status Report over WSP DL-OTA-2.0-int-121

6.2.22 Separate Delivery with Status Report over WTLS

Test Case Id	DL-OTA-2.0-int-122
Test Object	Client and Server
Test Case Description	Verify "normal" download of single media Object, with status report via WTLS. This is done by connecting from the client to the server via WTLS (class 1) and performing a "normal" download.
Specification Reference	[DLOTAv2-TS] Chapter 5.1.1
SCR Reference	DLOTA-C-009 (O) DLOTA-S-008 (O)
Tool	none
Test code	none
Preconditions	• The Server contains a Download Descriptor • The download descriptor includes InstallNotifyURI • The client supports WTLS, class 1 • The client is configured to use a WAP Gateway
Test Procedure	1. The client connects to the server via WTLS class 1 2. The user selects a URI that points to a download descriptor (DD) on a download server. 3. The Client tries to retrieve the DD. 4. The Download Server delivers DD 5. The Client parses the DD. The download descriptor includes an URI that references the media object. 6. The Client retrieves the corresponding Media file 7. The Download Server delivers the media file 8. Client receives the media file and installs the media object 9. The Client sends the Installation notification
Pass-Criteria	1. The Client is able to retrieve the media and makes it available to the user 2. The Download server receives the Installation Notification and acknowledges it with HTTP 200 series response code 3. The Server reports no error

Table 69: Separate Delivery with Status Report over WTLS DL-OTA-2.0-int-122

6.2.23 Multiple DDs in one transport entity

Test Case Id	DL-OTA-2.0-int-123
Test Object	Client and Server
Test Case Description	Verify handling of multiple DDs in one transport entity. This is done by connecting from the client to the server performing a "normal" download of two media objects each downloaded through its own download descriptor, but both DDs are retrieved in the same transport entity.
Specification Reference	[DLOTAv2-TS] Chapter 5.1.1
SCR Reference	DLOTA-C-011 (O) DLOTA-S-010 (O)
Tool	none
Test code	none
Preconditions	• The Server contains two Download Descriptors that can be sent together • Both download descriptors includes InstallNotifyURI
Test Procedure	1. The user selects a URI that points to an entity representing two download descriptors (DDs) on a download server. 2. The Client tries to retrieve the DDs. 3. The Download Server delivers DD together in the same transport entity (e.g. as multipart/mixed) 4. The Client parses the DDs. The download descriptors include an URI that references the media object. 5. The Client retrieves the corresponding Media files 6. The Download Server delivers the media files 7. Client receives the media files and installs the media objects 8. The Client sends two Installation notification
Pass-Criteria	1. The Client is able to retrieve the media and makes it available to the user 2. The Download server receives the two Installation Notifications and acknowledges them with HTTP 200 series response code 3. The Server reports no error

Table 70: Multiple DDs in one transport entity DL-OTA-2.0-int-123

6.2.24 Use WAP Push to deliver DD

Test Case Id	DL-OTA-2.0-int-124
Test Object	Client and Server
Test Case Description	Verify whether a DD can be sent to client using WAP Push. This is done by sending a DD using WAP Push from the server to the client, invoking this DD and letting client retrieve the corresponding media object.
Specification Reference	[DLOTAv2-TS] Chapter 5.6
SCR Reference	DLOTA-C-039 (O) DLOTA-S-024 (O)
Tool	None
Test code	None
Preconditions	• The Client supports handling DDs that comes in an WAP Push • The Server can send DDs in WAP Push messages
Test Procedure	1. The client receives a WAP Push that contains a DD. 2. The User opens the WAP Push and invokes the DD (e.g. double-clicking on it or chooses to download the object through an option menu). 3. The client downloads the media objects.
Pass-Criteria	1. The user can invoke the DD in order to initiate the media object retrieval. 2. The client downloads the correct media object successfully.

Table 71: Use WAP Push to deliver DD DL-OTA-2.0-int-124

6.3 Status Reporting

6.3.1 Status report Mechanism (Successful Notification)

Test Case Id	DL-OTA-2.0-int-201
Test Object	Client and Server
Test Case Description	Verify whether status report mechanism is processed properly in case of a success installation. This is done by letting a DDs request the 2 mandatory of the 4 types of notifications from the client.
Specification Reference	[DLOTAv2-TS] Chapter 5.3
SCR Reference	DLOTA-C-040 (M) DLOTA-C-041 (M) DLOTA-C-042 (M) DLOTA-S-020 (M) DLOTA-S-025 (O) DLOTA-S-027 (M)
Tool	none
Test code	none
Preconditions	• The Download Descriptor used, includes the request for status reports: o `reservationNotiryURI` element ▪ "DownloadTime" is set to 5 minutes into the future. o `installNotifyURI` element
Test Procedure	1. The User selects a URI that points to a download descriptor in a download server. 2. The Download server delivers the download descriptor to the client. 3. The reservation related Nofification is sent to the server 4. The user waits (5 minutes) for the Media Object to be downloaded and the installation Notification is sent to the server
Pass-Criteria	1. 2 types of notifications are sent by the client and are received by the server.

Table 72: Status report Mechanism (Successful Notification) DL-OTA-2.0-int-201

6.3.2 Deletion of Media Object in the terminal (Deletion Notification)

Test Case ID	DL-OTA-2.0-int-202
Test Object	Client and Server
Test Case Description	To test that the server is notified in case the Media Object was remove from the terminal. This is done by downloading a DD where the deleteNotifyURI element is included. When the media object is later removed, the client should send a deletion notification to the server.
Specification Reference	[DLOTAv2-TS] Section 5.4.2 [DLOTAv2-AD] Section 6.5
SCR Reference	DLOTA-C-034 (O), DLOTA-S-021 (O),
Tool	None
Test Code	None
Preconditions	• The Download Descriptor used, includes the request for status reports: • `deleteNotifyURI` element
Test Procedure	1. The User selects a URI that points to a download descriptor in a download server. 2. The Download server delivers the download descriptor to the client. 3. The Media Object is downloaded 4. The user selects the Media Object to be removed. 5. The terminal (Download Agent) begins to remove the Media Object from the file system. 6. The Client sends the DeletionNotification to the server
Pass-Criteria	1. The server is notified with a Deletion Notification message.

Table 73: Deletion of Media Object in the terminal DL-OTA-2.0-int-202

6.3.3 Download Completion Notification

Test Case Id	DL-OTA-2.0-int-203
Test Object	Client and Server
Test Case Description	Verify whether Download completion notification is sent and processed properly.
Specification Reference	[DLOTAv2-TS] Chapter 5.2.6 [DLOTAv2-TS] Chapter 6.1
SCR Reference	DLOTA-C-041 (O) DLOTA-S-026 (O)
Tool	None
Test code	None
Preconditions	• DownloadNotifyURI is included in the Download Descriptor for sending the Server the Download Notification.
Test Procedure	1. The User browses a Media Object using a Browser (left to the implementation). 2. If the User is prompted to confirm the downloading of the Media Object, the User MUST confirms it. 3. The Download Agent retrieves the Media Object if there is enough memory available. 4. User verifies that the Media Object is successfully retrieved.
Pass-Criteria	1. A Download Completion Notification is received in the Server

Table 74: Download Completion Notification DL-OTA-2.0-int-203

6.4 Misc.

6.4.1 HTTP Digest authentication

Test Case Id	DL-OTA-2.0-int-301
Test Object	Client
Test Case Description	Verify whether HTTP digest authentication is processed properly in the Download Agent.
Specification Reference	[DL-OTA] Section 8.1
SCR Reference	DLOTA-C-051 (M) DLOTA-S-032 (M)
Tool	None
Test code	None
Preconditions	• The Dowload Descriptor and the Media Object are co-delivered. • InstallNotifyURI element is included in the Dowload Descriptor for sending the Server the Install Notification. • DownloadNotifyURI is included in the Dowload Descriptor for sending the Server the Download Notification. • The Server MUST include both objectID and objectVersion elements in the mediaObject element of the DD. • The Download Server initiates authentication within a HTTP session by sending a HTTP Unauthorized message.
Test Procedure	1. The User browses a Media Object using a Browser (left to the implementation). 2. User confirms download the Media Object. 3. User is requested to introduce a login and a password. 4. If login and password are correct (and there is enough memory available) the downloading of the Media Object starts. 5. User verifies that the Media Object is successfully retrieved. 6. (optional) User installs the new version of the Media Object.
Pass-Criteria	1. The Download Agent asks the User for a login and a password. 2. The Server receives the login and password introduced by the User and checks their validity. 3. A Download Completion Notification is received in the Server. 4. If User selects to install the Media Object, it is successfully installed, and the Server receives an Installation Notification.

Table 75: HTTP Digest authentication DL-OTA-2.0-int-301

6.4.2 Server authentication

Test Case Id	DL-OTA-2.0-int-302
Test Object	Client and Server
Test Case Description	Verify whether Server Authentication is executed properly This is done by first adding the server Certificate in the client, then connecting to the server using HTTPS in the URI used, in order to indicate that TLS should be used for the connection.
Specification Reference	[DLOTAv2-TS] Chapter 8.2
SCR Reference	DLOTA-C-053 (M) DLOTA-S-034 (M)
Tool	none
Test code	none
Preconditions	• The Server must accept the https:// prefix as a means to set up a TLS connection • The Server certificate is downloaded into the client before the test case is executed.
Test Procedure	1. The User selects a URI that points to a download descriptor in a download server and uses https:// as a prefix in order to use TLS 2. The Download server sets up a TLS connection and delivers the download descriptor to the client. 3. The Media Object is downloaded
Pass-Criteria	1. The server sets up a TLS connection 2. The Download transaction is performed in full over this connection

Table 76: Server authentication DL-OTA-2.0-int-302

6.4.3 WAP TLS Profile (Mandatory Cipher Suites)

Test Case Id	DL-OTA-2.0-int-303
Test Object	Client and Server
Test Case Description	Verify whether the Download Descriptors and Media Object ciphered by the Server (using WAP TLS Profile mandatory cipher suites) are downloaded and installed (optional) properly.
Specification Reference	[DLOTAv2-TS] Chapter 8.4
SCR Reference	DLOTA-C-056 (M) DLOTA-C-057 (M), DLOTA-C-058 (M) DLOTA-S-036 (M), DLOTA-S-037 (M), DLOTA-S-038 (M)
Tool	
Test code	
Preconditions	• DownloadNotifyURI is included in the Download Descriptor for sending the Server the Download Notification. • The Client and Server MUST support Server authentication. • A TLS tunnel MUST be established by the Client using a HTTP CONNECT method. • A TLS connection MUST be established with a TLS message exchange prior the Media Object is requested. • The Download Server MUST implement the following cipher suites in coding the Download Descriptor and the Media Object: TLS_RSA_WITH_3DES_EDE_CBC_SHA. • The Download Agent MUST implement the following cipher suites: TLS_RSA_WITH_3DES_EDE_CBC_SHA. Note: As a TLS connection is used for Server Authentication, the authenticated download must also be confidentiality and integrity protected.
Test Procedure	1. The User decides to retrieve a Media Object using the Download Agent. 2. The Download Agent begins to retrieve the Media Object, if there is enough memory available. 3. User verifies that the Media Object is successfully retrieved.
Pass-Criteria	1. The Server receives the request and sends the Download Descriptor and afterwards the Media Object. 2. The Download Completion Notification is recevied in the Server. 3. The Download Agent is able to run and/or install the Media Object downloaded ciphered by the Server using the TLS profile configured.

Table 77: WAP TLS Profile (Mandatory Cipher Suites) DL-OTA-2.0-int-303

6.4.4 WAP TLS Profile (Optional Cipher Suites)

Test Case Id	DL-OTA-2.0-int-304
Test Object	Client and Server
Test Case Description	Verify whether the Download Descriptors and Media Object ciphered by the Server (using WAP TLS Profile optional cipher suites) are downloaded and installed (optional) properly
Specification Reference	[DLOTAv2-TS] Chapter 8.4
SCR Reference	DLOTA-C-059 (O) DLOTA-S-038 (M)
Tool	
Test code	
Preconditions	• DownloadNotifyURI is included in the Download Descriptor for sending the Server the Download Notification. • The Download Descriptor and the Media Object are co-delivered. • The Client and Server MUST support Server authentication. • A TLS tunnel MUST be established by the client using a HTTP CONNECT method. • A TLS connection MUST be established with a TLS message exchange prior the Media Object was requested. • The Download Server MUST implement the following cipher suites in coding the Download Descriptor and the Media Object: TLS_RSA_WITH_AES_128_CBC_SHA [RFC3268]. • The Download Server SHOULD implement the following cipher suites: TLS_RSA_WITH_AES_128_CBC_SHA [RFC3268]. Note: As a TLS connection is used for Server Authentication, the authenticated download must also be confidentiality and integrity protected.
Test Procedure	1. The User decides to retrieve a Media Object using the Download Agent. 2. The Download Agent begins to retrieve the Media Object, if there is enough memory available. 3. User verifies that the Media Object is successfully retrieved.
Pass-Criteria	1. The Server receives the request and sends the Download Descriptor and afterwards the Media Object. 2. The Download Completion Notification is recevied in the Server. 3. The Download Agent is able to run and/or install the Media Object downloaded ciphered by the Server using the configured TLS profile.

Table 78: WAP TLS Profile (Optional Cipher Suites) DL-OTA-2.0-int-304

6.4.5 GAA

Test Case Id	DL-OTA-2.0-int-305
Test Object	Client and Server
Test Case Description	Verify whether Download Agent authentication using GAA is processed properly in the 3GPP Download Agent implementation.
Specification Reference	[DL-OTA] Chapter 8.1
SCR Reference	DLOTA-C-052 (O) DLOTA-S-033 (O)
Tool	None
Test code	None
Preconditions	• The Download Descriptor and the Media Object are co-delivered. • InstallNotifyURI element is included in the Download Descriptor for sending the Server the Install Notification. • The Server MUST include both objectID and objectVersion elements in the mediaObject element of the Download Descriptor. • The Download Agent MUST send an HTTP request with a constant string “3gpp-gba” in the HTTP header. • The Download Server MUST send the HTTP WWW-Authenticate message with a constant string “3gpp-bootstraping” in the HTTP header.
Test Procedure	1. The User browses a Media Object using a Browser (left to the implementation). 2. If the User is prompted to confirm the download of the Media Object, the User MUST confirm it.. 3. The Download Agent asks the user for a login and a password. 4. If the login and password are correct, the Download Agent retrieves the Media Object if there is enough memory available. 5. User verifies that the Media Object is successfully retrieved. 6. (optional) User installs the new version of the Media Object.
Pass-Criteria	1. The User can choose (thorugh the Browser) to retrieve the Media Object. 2. The Server receives the string “3gpp-gba” within the HTTP request from the Download Agent. 3. The Server receives the login and password that was typed in the terminal by the User and checks their validity. 4. If User selects to install the Media Object, it is successfully installed, and the Server receives an Installation Notification.

Table 79: Test Information GAA DL-OTA-2.0-int-305

6.4.6 Updating media objects using HTTP as a Transfer Protocol

Test Case ID	DL-OTA-2.0-int-306
Test Object	Client and Server
Test Case Description	To test if a Media Object already stored on the client device is correctly updated, selecting previously the transfer protocol (HTTP).
Specification Reference	[DLOTAv2-TS] Section 5.1.1 [DLOTAv2-AD] Section 6.4
SCR Reference	DLOTA-C-006 (M), DLOTA-S-005 (M)
Tool	None
Test Code	None
Preconditions	• A new version of the Media Object has to be available in to the server. • The server MUST include both objectID and objectVersion elements in the mediaObject element of the DD. • Download Agent and Download Server MUST support HTTP and TLS protocols. • The Dowload Descriptor and the Media Object are delivered separately. • InstallNotifyURI element is included in the Dowload Descriptor for sending the server the Install Notification. • DownloadNotifyURI is included in the Dowload Descriptor for sending the server the Download Notification.
Test Procedure	1. The terminal has to know (left to implementation) that a new version of the Media Object is available into the server. 2. The terminal notifies the user that the version available is newer than the version installed. 3. User confirms donwload/update. 4. The terminal (Download Agent) retrieves the Media Object if there is enough memory available. 5. User verifies that the Media Object is successfully retrieved. 6. (optional) User installs the new version of the Media Object.
Pass-Criteria	1. The terminal notifies the user the newer version of the Media Object. 2. The client can choose to retrieve the Media Object. 3. A Download Completion Notification is received in the server. 4. If client select to install the Media Object, it is successfully installed, and the server receives a Installation Notification.

Table 80: Updating media objects using HTTP as a Transfer Protocol DL-OTA-2.0-int-306

6.4.7 Updating media objects using TLS as a Transfer Protocol

Test Case ID	DL-OTA-2.0-int-307
Test Object	Client device
Test Case Description	To test if a Media Object already stored on the client device is correctly updated, selecting previously the transfer protocol (TLS).
Specification Reference	[DLOTAv2-TS] Section 5.1.1 [DLOTAv2-AD] Section 6.4
SCR Reference	DLOTA-C-007 (M), DLOTA-S-006 (M),
Tool	None
Test Code	None
Preconditions	• A new version of the Media Object has to be available in to the server. • The Dowload Descriptor and the Media Object are delivered separately. • Download Agent and Download Server MUST support HTTP and TLS protocols. • InstallNotifyURI element is included in the Dowload Descriptor for sending the server the Install Notification. • DownloadNotifyURI is included in the Dowload Descriptor for sending the server the Download Notification. • The server MUST include both objectID and objectVersion elements in the mediaObject element of the DD.
Test Procedure	1. The terminal has to know (left to implementation) that a new version of the Media Object is available into the server. 2. The terminal notifies the user that the version available is newer than the version installed. 3. User confirms donwload/update. 4. The terminal (Download Agent) retrieves the Media Object if there is enough memory available. 5. User verifies that the Media Object is successfully retrieved. 6. (optional) User installs the new version of the Media Object.
Pass-Criteria	1. The terminal notifies the user the newer version of the Media Object. 2. The client can choose to retrieve the Media Object. 3. A Download Completion Notification is received in the server. 4. If client select to install the Media Object, it is successfully installed, and the server receives a Installation Notification.

Table 81:Updating media objects using TLS as a Transfer Protocol DL-OTA-2.0-int-307

6.5 Error Flow

6.5.1 Status report mechanism (Unsuccessful Notification – User Cancel)

Test Case Id	DL-OTA-2.0-int-401
Test Object	Client and Server
Test Case Description	Verify whether status report mechanism is processed properly in case of an unsuccessful installation This is done by attemting to download a media object (separate delivery) and cancel the operation during the download.
Specification Reference	[DLOTAv2-TS] Chapter 5.3
SCR Reference	DLOTA-C-026 (M) DLOTA-S-020 (M)
Tool	none
Test code	none
Preconditions	• The client device must be able to download the download descriptor.
Test Procedure	1. The User selects a URI that points to a download descriptor in a download server. 2. The Download server delivers the download descriptor to the client. The download descriptor includes an InstallNotifyURI attribute and an URI that references the media object. 3. Client request the media object file from the download server. 4. During the download the user cancels the operation
Pass-Criteria	1. The download descriptor is delivered successfully. 2. The download operation is cancelled. The client sends Installation Notification with errors status “902 User Cancelled” to the download server. The media object is not made available to the user.

Table 82: Status report mechanism (Unsuccessful Notification – User Cancel) DL-OTA-2.0-int-401

6.5.2 The user chooses not to initiate the media object update

Test Case ID	DL-OTA-2.0-int-402
Test Object	Client device
Test Case Description	To test if the user can stop the updating of the Media Object already stored even it is older then the Media Object into the server.
Specification Reference	[DLOTAv2-TS] Section 5.2.4 [DLOTAv2-AD] Section 6.1
SCR Reference	DLOTA-C-019 (O), DLOTA-S-014 (O),
Tool	None
Test Code	None
Preconditions	• A new version of the Media Object has to be available in to the server. • The Dowload Descriptor and the Media Object are delivered separately. • InstallNotifyURI element is included in the Dowload Descriptor for sending the server the Install Notification • DownloadNotifyURI is included in the Dowload Descriptor for sending the server the Download Notification • The server MUST include both objectID and objectVersion elements in the mediaObject element of the DD.
Test Procedure	1. The terminal has to know (left to implementation) that a new version of the Media Object is available into the server. 2. The terminal notifies the user that the version available is newer than the version installed. 3. The user chooses not to initiate the updating process. 4. The Media Object updating process cancels at all.
Pass-Criteria	1. The terminal notifies the user the newer version of the Media Object. 2. There is no updating of the Media Object in the terminal. 3. A “User Cancelled” is received by the Server.

Table 83: The user chooses not to initiate the media object update DL-OTA-2.0-int-402

6.5.3 The Media Object is not available on Donwload Server

Test Case ID	DL-OTA-2.0-int-403
Test Object	Client and Server
Test Case Description	To test if the terminal (Donwload Agent) aborts the downloading if the Media Object is not available on the Download Server.
Specification Reference	[DLOTAv2-TS] Section 5.2.4 [DLOTAv2-AD] Section 6.14
SCR Reference	DLOTA-C-017 (M), DLOTA-S-012 (M),
Tool	None
Test Code	None
Preconditions	• The user must subscribe the service that push Media Objects to the terminal. • The server device must be able to push the Download Descriptor through a Push Gateway/Proxy. • The Media Object is not available on the Donwload Server, but the Download Descriptor MUST send to the terminal. • The Dowload Descriptor and the Media Object are delivered separately. • InstallNotifyURI element is included in the Dowload Descriptor for sending the server the Install Notification. • DownloadNotifyURI is included in the Dowload Descriptor for sending the server the Download Notification. • The server MUST include both objectID and objectVersion elements in the mediaObject element of the DD.
Test Procedure	1. The terminal (Download Agent) could notify the user the automatic downloading of a Media Object. 2. The terminal (Download Agent) try to fetch the Media Objet automatically. 3. The downloading is not completed.
Pass-Criteria	1. The user could know that a new Media Object is being downloaded. 2. The terminal notifies the user that the donwload process was canceled by the terminal. 3. A Cancel Notification is received in the server.

Table 84: The Media Objet is not available on Donwload Server DL-OTA-2.0-int-403

6.5.4 A Single Object of the Compound Object is not available

Test Case ID	DL-OTA-2.0-int-404
Test Object	Client and Server
Test Case Description	To test if the terminal aborts the transaction if a single object of the Compound Object is not completed.
Specification Reference	[DLOTAv2-TS] Section 5 [DLOTAv2-AD] Section 6.8
SCR Reference	DLOTA-C-003 (O), DLOTA-S-003 (M)
Tool	None
Test Code	None
Preconditions	• The Content Portal creates the Donwload Descriptor for the Compound Object, with several Media Objects from different Donwload Servers. • One Single Object is missed in one of the Servers. • The user do not mind that the object is compound. • The Dowload Descriptor and the Media Object are delivered separately. • InstallNotifyURI element is included in the Dowload Descriptor for sending the Content Portal the Install Notification. • DownloadNotifyURI is included in the Dowload Descriptor for sending to every server the Download Notification. • The conent portal MUST include both objectID and objectVersion elements in the mediaObject element of the DD.
Test Procedure	1. The user browses a new Media Object (Compound Object) and decides to retrieve it. 2. The terminal (Download Agent) begins to retrieve the Media Object if there is enough memory available. 3. Terminal notifies the user that, at least, one object of the Compound Objetc is not available. 4. The terminal (Download Agent) discards all previously downloaded objects related with the compound Object.
Pass-Criteria	1. The user can choose to download correctly a Media Object that is a Compound Object. 2. The Download Agent aborts the OTA transaction of the Compound Object and dicards all previous dowloaded objects related. 3. The server receives a Failure Notification from the terminal.

Table 85: A Single Object of the Compound Object is not available DL-OTA-2.0-int-404

6.5.5 Download Descriptor Content-Type not included

Test Case Id	DL-OTA-2.0-int-405
Test Object	Client and Server
Test Case Description	Verify the behaviour of the Download Agent if the Download Descriptor Content-Type is not properly advised.
Specification Reference	[DLOTAv2-TS] Chapter 5.1.1
SCR Reference	DLOTA-C-010 (M) DLOTA-S-009 (M)
Tool	None
Test code	None
Preconditions	• The Dowload Descriptor and the Media Object are delivered separately. • InstallNotifyURI element is included in the Download Descriptor for sending the Server the Install Notification. • DownloadNotifyURI is included in the Download Descriptor for sending the Server the Download Notification. • The Server MUST include both objectID and objectVersion elements in the mediaObject element of the DD. • The Content-Type parameter in the transport protocol MUST NOT be included.
Test Procedure	1. The User browses a Media Object using a Browser (left to the implementation). 2. User confirms the download of the Media Object. 3. The Download Agent receives the Download Descriptor.
Pass-Criteria	1. As the Content-Type of the Download Descriptor is not received by the Download Agent, the Download Descriptor is discarded and the process stops.

Table 86: Download Descriptor Content-Type not included DL-OTA-2.0-int-405

6.5.6 HTTP Digest authentication – Download Agent Authentication Fails

Test Case Id	DL-OTA-2.0-int-406
Test Object	Client and Server
Test Case Description	Verify whether HTTP digest authentication is processed properly in the Download Agent but fails because of the incorrect login or password.
Specification Reference	[DL-OTA] Section 8.1
SCR Reference	DLOTA-C-051 (M) DLOTA-S-032 (M)
Tool	None
Test code	None
Preconditions	• The Dowload Descriptor and the Media Object are co-delivered. • InstallNotifyURI element is included in the Dowload Descriptor for sending the Server the Install Notification. • DownloadNotifyURI is included in the Dowload Descriptor for sending the Server the Download Notification. • The Server MUST include both objectID and objectVersion elements in the mediaObject element of the DD. • The Download Server initiates authentication with in a HTTP session by sending a HTTP Unauthorized message.
Test Procedure	1. The User browses a Media Object using a Browser (left to the implementation). 2. User confirms donwload the Media Object. 3. User is requested to introduce a login and a password (One of the introduced values (login or password) is incorrect). 4. Download Agent does not retrieve the Media Object. 5. Depending of the Server configuration the Download Agent can ask the User for login/password a configured amount of times. 6. If the login and/or the password are incorrect the maximum allowed times configured in the Server, Download Agent does not retrieve the Media Object and prompts an unauthorized message.
Pass-Criteria	1. The Server receives the incorrect login and/or password introduced in by the user . 2. If the Server receives incorrect login or password the maximum allowed configured times the Media Object is not delivered and the Download Agent is notified with an Unauthorized message.

Table 87: HTTP Digest Authentication – Download Agent Authentication Fails DL-OTA-2.0-int-406

Appendix A. Change History (Informative)

A.1 Approved Version History

Reference	Date	Description
n/a	n/a	No prior version –or- No previous version within OMA

A.2 Draft/Candidate Version History

Document Identifier	Date	Sections	Description
Draft Versions OMA-ETS-DLOTA-V2_0	08 May 2006	All	First version
	05 June 2006	6,2 and 6.5	Incorporated CRs: OMA-IOP-BRO-2006-0084 OMA-IOP-BRO-2006-0085
	13 June 2006	All	Updated SCR references. Remuved duplicates.
	01 Sept 2006	6.4.1, 6.5.6 6.4.4-5 6.3.5 6.4.6 5.2.2.3-5 5.2.2.15 5.2.2.14 5.2.6.4	Incorporates input to committee: OMA-IOP-BRO-2006-0115 OMA-IOP-BRO-2006-0119R01 OMA-IOP-BRO-2006-0123R01 OMA-IOP-BRO-2006-0124R01 OMA-IOP-BRO-2006-0133R01 OMA-IOP-BRO-2006-0134 OMA-IOP-BRO-2006-0135 OMA-IOP-BRO-2006-0137
	26 Sept 2006	5.3.1, 6.1 5.2.3.1 5.2.2.9, 5.2.2.10 5.2.2.11	Incorporated CRs: OMA-IOP-BRO-2006-0142R01 OMA-IOP-BRO-2006-0148R01 OMA-IOP-BRO-2006-0154 OMA-IOP-BRO-2006-0155
	04 Oct 2006	5,2,1, 5,2,2,12, 5.2.5.1, 5.2.5.2, 6.2.5, 6.3.3 All	Incorporated CR: OMA-IOP-BRO-2006-0166
	11 Oct 2006	5.2.1.6, 5.2.659 5.2.1.16, 5.2.1.17 5.2.1.14 5.2.2.2, 5.2.2.3 5.3.2, 5.2.3.2 5.2.2.1, 6.3.1, 6.3.2, 6.3.3 6.2.12, 6.2.13, 6.2.16 6.4.2, 6.4.3, 6.4.4., 6.4.5 5.3.3	Incorporated CRs: OMA-IOP-BRO-2006-0136R03 OMA-IOP-BRO-2006-0183R01 OMA-IOP-BRO-2006-0167R01 OMA-IOP-BRO-2006-0172 OMA-IOP-BRO-2006-0168R01 OMA-IOP-BRO-2006-0169R01 OMA-IOP-BRO-2006-0177R01 OMA-IOP-BRO-2006-0178 OMA-IOP-BRO-2006-0179
	12 Oct 2006	All	Assigning numbers to test cases, cleaning

Document Identifier	Date	Sections	Description
	26 Oct 2006	5.2.5.12 5.2.1.22 5.2.5.13 App B	Incorporates input to committee: OMA-IOP-BRO-2006-0185R01 OMA-IOP-BRO-2006-0187R03 Added Appendix B with SCR coverage
	15 Nov 2006	5.2.1.12, 5.2.4.1, 5.3.1, 6.1.1-4, 5.2.3.1, 6.2.21-24	Incorporated CRs: OMA-IOP-BRO-2006-0205R01 OMA-IOP-BRO-2006-0206R01
	30 Nov 2006	n/a	IOP WG agreed
Candidate Version OMA-ETS-DLOTA-V2_0	19 Dec 2006	n/a	Status changed to Candidate, TP R&A from 2006-12-06 to 2006-12-19 OMA-TP-2006-0445-INP_OMA_ETS_DLOTA_V2_0_for_Approval_as_Candidate

Appendix B. Static Conformance Requirements Coverage

B.1 Client

The table below shows which SCRs are being covered by which Test Case.

In Summary:

26 out of 28 Mandatory SCRs are covered by test cases, i.e. 93%.

27 out of 33 Optional SCRs are covered by test cases, i.e. 82%.

Item	Status	Test Case
DLOTA-C-001	M	DL-OTA-2.0-int-101, DL-OTA-2.0-int-103, DL-OTA-2.0-int-104
DLOTA-C-002	O	DL-OTA-2.0-int-112, DL-OTA-2.0-int-115
DLOTA-C-003	O	DL-OTA-2.0-int-113, DL-OTA-2.0-int-404
DLOTA-C-004	O	DL-OTA-2.0-int-114
DLOTA-C-005	O	DL-OTA-2.0-con-011, DL-OTA-2.0-con-012
DLOTA-C-006	M	DL-OTA-2.0-int-306
DLOTA-C-007	M	DL-OTA-2.0-int-307
DLOTA-C-008	O	DL-OTA-2.0-int-121
DLOTA-C-009	O	DL-OTA-2.0-int-122
DLOTA-C-010	M	DL-OTA-2.0-int-405
DLOTA-C-011	O	DL-OTA-2.0-int-123
DLOTA-C-012	O	DL-OTA-2.0-int-102, DL-OTA-2.0-int-111
DLOTA-C-013	M	DL-OTA-2.0-con-402
DLOTA-C-014	M	DL-OTA-2.0-con-201
DLOTA-C-015	M	DL-OTA-2.0-con-001, DL-OTA-2.0-con-002, DL-OTA-2.0-con-401
DLOTA-C-016	M	DL-OTA-2.0-con-003, DL-OTA-2.0-con-004, DL-OTA-2.0-con-005
DLOTA-C-017	M	DL-OTA-2.0-con-405, DL-OTA-2.0-con-406, DL-OTA-2.0-con-407, DL-OTA-2.0-int-403
DLOTA-C-018	O	DL-OTA-2.0-int-106, DL-OTA-2.0-int-107, DL-OTA-2.0-int-108, DL-OTA-2.0-int-109
DLOTA-C-019	O	DL-OTA-2.0-int-105, DL-OTA-2.0-int-110, DL-OTA-2.0-int-402
DLOTA-C-020	O	DL-OTA-2.0-int-116
DLOTA-C-021	O	DL-OTA-2.0-int-118, DL-OTA-2.0-int-119
DLOTA-C-022	O	DL-OTA-2.0-int-117
DLOTA-C-023	O	DL-OTA-2.0-con-013, DL-OTA-2.0-con-014
DLOTA-C-024	O	DL-OTA-2.0-con-016, DL-OTA-2.0-con-017, DL-OTA-2.0-con-018
DLOTA-C-025	O	
DLOTA-C-026	M	DL-OTA-2.0-con-403, DL-OTA-2.0-con-404, DL-OTA-2.0-con-408, DL-OTA-2.0-con-409, DL-OTA-2.0-int-401
DLOTA-C-027	M	DL-OTA-2.0-con-006,
DLOTA-C-028	O	DL-OTA-2.0-con-015
DLOTA-C-029	O	
DLOTA-C-030	M	DL-OTA-2.0-con-007, DL-OTA-2.0-con-008
DLOTA-C-031	O	DL-OTA-2.0-con-102, DL-OTA-2.0-con-103
DLOTA-C-032	M	DL-OTA-2.0-con-019
DLOTA-C-033	O	DL-OTA-2.0-con-020

Item	Status	Test Case
DLOTA-C-034	O	DL-OTA-2.0-int-202
DLOTA-C-035	M	
DLOTA-C-036	M	DL-OTA-2.0-con-202
DLOTA-C-037	O	
DLOTA-C-038	O	DL-OTA-2.0-int-120
DLOTA-C-039	O	DL-OTA-2.0-int-124
DLOTA-C-040	M	DL-OTA-2.0-int-201
DLOTA-C-041	O	DL-OTA-2.0-int-201, DL-OTA-2.0-int-203
DLOTA-C-042	M	DL-OTA-2.0-int-201
DLOTA-C-043	O	
DLOTA-C-044	M	DL-OTA-2.0-con-101
DLOTA-C-045	M	DL-OTA-2.0-con-201, DL-OTA-2.0-con-410
DLOTA-C-046	M	DL-OTA-2.0-con-410
DLOTA-C-047	O	DL-OTA-2.0-con-412
DLOTA-C-048	O	DL-OTA-2.0-con-021, DL-OTA-2.0-con-411
DLOTA-C-049	O	
DLOTA-C-050	M	
DLOTA-C-051	M	DL-OTA-2.0-int-301, DL-OTA-2.0-int-406
DLOTA-C-052	O	DL-OTA-2.0-int-305
DLOTA-C-053	M	DL-OTA-2.0-int-302
DLOTA-C-054	M	DL-OTA-2.0-con-009, DL-OTA-2.0-con-010
DLOTA-C-055	O	
DLOTA-C-056	M	DL-OTA-2.0-int-303
DLOTA-C-057	M	DL-OTA-2.0-int-303
DLOTA-C-058	M	DL-OTA-2.0-int-303
DLOTA-C-059	O	DL-OTA-2.0-int-304
DLOTA-C-060	O	DL-OTA-2.0-con-022, DL-OTA-2.0-con-413
DLOTA-C-061	M	DL-OTA-2.0-int-001, DL-OTA-2.0-int-002, DL-OTA-2.0-int-003, DL-OTA-2.0-int-004

B.2 Server

In Summary:

17 out of 18 Mandatory SCRs are covered by test cases, i.e. 94%.

16 out of 22 Optional SCRs are covered by test cases, i.e. 73%.

Item	Status	Test Case
DLOTA-S-001	M	DL-OTA-2.0-int-101, DL-OTA-2.0-int-103, DL-OTA-2.0-int-104
DLOTA-S-002	M	DL-OTA-2.0-int-112, DL-OTA-2.0-int-115
DLOTA-S-003	M	DL-OTA-2.0-int-113, DL-OTA-2.0-int-404
DLOTA-S-004	M	DL-OTA-2.0-int-114
DLOTA-S-005	M	DL-OTA-2.0-int-306
DLOTA-S-006	M	DL-OTA-2.0-int-307
DLOTA-S-007	O	DL-OTA-2.0-int-121

Item	Status	Test Case
DLOTA-S-008	O	DL-OTA-2.0-int-122
DLOTA-S-009	M	DL-OTA-2.0-con-502, DL-OTA-2.0-int-405
DLOTA-S-010	O	DL-OTA-2.0-int-123
DLOTA-S-011	O	DL-OTA-2.0-int-102, DL-OTA-2.0-int-111
DLOTA-S-012	M	DL-OTA-2.0-int-403
DLOTA-S-013	O	DL-OTA-2.0-int-106, DL-OTA-2.0-int-107, DL-OTA-2.0-int-108, DL-OTA-2.0-int-109
DLOTA-S-014	O	DL-OTA-2.0-int-105, DL-OTA-2.0-int-110, DL-OTA-2.0-int-402
DLOTA-S-015	O	DL-OTA-2.0-int-116
DLOTA-S-016	O	DL-OTA-2.0-int-118, DL-OTA-2.0-int-119
DLOTA-S-017	O	DL-OTA-2.0-int-117
DLOTA-S-018	O	
DLOTA-S-019	O	
DLOTA-S-020	M	DL-OTA-2.0-int-201, DL-OTA-2.0-int-401
DLOTA-S-021	O	DL-OTA-2.0-int-202
DLOTA-S-022	M	
DLOTA-S-023	O	DL-OTA-2.0-int-120
DLOTA-S-024	O	DL-OTA-2.0-int-124
DLOTA-S-025	O	DL-OTA-2.0-int-201
DLOTA-S-026	O	DL-OTA-2.0-int-203
DLOTA-S-027	M	DL-OTA-2.0-int-201
DLOTA-S-028	O	
DLOTA-S-029	M	DL-OTA-2.0-con-503
DLOTA-S-030	M	DL-OTA-2.0-con-503
DLOTA-S-031	O	
DLOTA-S-032	M	DL-OTA-2.0-int-301, DL-OTA-2.0-int-406
DLOTA-S-033	O	DL-OTA-2.0-int-305
DLOTA-S-034	M	DL-OTA-2.0-int-302
DLOTA-S-035	O	
DLOTA-S-036	M	DL-OTA-2.0-int-303
DLOTA-S-037	M	DL-OTA-2.0-int-303
DLOTA-S-038	M	DL-OTA-2.0-int-303, DL-OTA-2.0-int-304
DLOTA-S-039	O	
DLOTA-S-040	O	DL-OTA-2.0-con-501, DL-OTA-2.0-int-001, DL-OTA-2.0-int-002, DL-OTA-2.0-int-003, DL-OTA-2.0-int-004