Enabler Validation Plan for Dynamic Content Delivery

Candidate Version 1.0 – 14 Jul 2009

Open Mobile Alliance

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1. Scope

This document details the Validation plan for the Dynamic Content Delivery Enabler Release. The successful accomplishment of the validation activities will be required for the Enabler to be considered for Approved status.

The validation plan for the Dynamic Content Delivery Enabler Release specifications is based on testing expectations in the Enabler Test Requirements (ETR). While the specific test activities to be performed are described in the Enabler Test Specification (ETS) the test environment is described in this plan. This test environment details infrastructure, operational and participation requirements identified for the needed testing activities.

1.1   Assumptions

None so far.

1.2   Exclusions

None so far.

2. References

2.1 Normative References

[IOPPROC]	"OMA Interoperability Policy and Process", Version 1.8, Open Mobile Alliance™, OMA-ORG-IOP_Process-V1_8, 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
[OMA-DCD-TS-Semantics]	"Dynamic Content Delivery Technical Specification – Session and Transactions", Version 1.0, Open Mobile Alliance™, OMA-TS-DCD_Semantics-V1_0, URL:http://www.openmobilealliance.org/
[DCD-TS-BCAST]	"OMA Dynamic Content Delivery Technical Specification – BCAST Adaptation", Version 1.0, Open Mobile Alliance™, OMA-TS-DCD_Call_Flows-V1_0
[DCD-TS-CBS]	"OMA Dynamic Content Delivery Technical Specification – CBS Adaptation", Version 1.0, Open Mobile Alliance™, OMA-TS-DCD_CBS_Adaptation-V1_0, URL:http://www.openmobilealliance.org/
[DCD-TS-Charging]	"OMA Dynamic Content Delivery Technical Specification – Charging ", Version 1.0, Open Mobile Alliance™, OMA-TS-DCD_Charging-V1_0, URL:http://www.openmobilealliance.org/
[IOPETR]	"Enabler Test Requirements for Dynamic Content Delivery", Version 1.0, Open Mobile Alliance™, OMA-DCD-ETR-V1_0, URL:http://www.openmobilealliance.org/
[IOPETS]	"IOP Enabler Test Specifications for Dynamic Content Delivery", Version 1.0, Open Mobile Alliance™, OMA-DCD-ETS-V1_0, URL:http://www.openmobilealliance.org/
[DCD-EICS-Client]	"Client Enabler Implementation Conformance Statement for Dynamic Content Delivery", Version 1.0, Open Mobile Alliance™, OMA-EICS-DCD-Client-V1_0, URL:http://www.openmobilealliance.org/
[DCD-EICS-Server]	"Server Enabler Implementation Conformance Statement for Dynamic Content Delivery", Version 1.0, Open Mobile Alliance™, OMA-EICS-DCD-Server-V1_0, URL:http://www.openmobilealliance.org/

2.2 Informative References

[OMADICT]	"Dictionary for OMA Specifications", Version 2.7, Open Mobile Alliance™, OMA-ORG-Dictionary-V2_7, URL:http://www.openmobilealliance.org/

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.

3.2 Definitions

DCD Client	A client (see [OMA-DICT]) that acts as the receiver of a DCD service (e.g. the reception, personalization, customization, charging, notification and storage of DCD Content as well as authentication of the DCD Server). The DCD Client does not render (e.g. display, play etc) DCD Content, but provide DCD Service management and delivery functions for the DCD-Enabled Client Applications
DCD Server	A Server (see [OMA-DICT]) capable of communicating with any DCD Client for the purpose of delivery of DCD Content and control information over various of mobile networks and bearers (e.g. Point-To-Point and Point-To-MultiPoint).
Test Fest	Interoperability event organised by OMA where can exercise interconnection between early implementations.

3.3 Abbreviations

OMA	Open Mobile Alliance
DCD	Dynamic Content Delivery
ETR	Enabler Test Requirements
OSI	Open Systems Interconnection

4. Enabler Validation Description

DCD is an enabler providing a service that can be considered at the level of the Presentation and Session layers as defined by the OSI model. The validation of DCD with market ready implementations will require some test applications that perform the Application layer functions at both the client and server. On this enabler validation it will be as much as possible minimised the dependency of the application layer by trying to anticipate the typical application functionalities, however it will be tried to supply a test application executable for the maximum number of varieties of clients and servers that will allow a consistent and homogeneous execution of the test cases.

The validation of this enabler will be above all focused on the functionalities where there is enough complexity on the operations between clients and servers.

A conformance testing program for clients and servers is by all means encouraged but will not be a requirement for the validation of the enabler specifications.

5. TestFest Activities

5.1   Enabler Test Guidelines

5.1.1   Minimal Test Configuration

For the testing of this enabler the minimum configuration is:

- A DCD Server

- A DCD Test Content Provider with some static test content

- A DCD Client

- A DCD Enabled Client Application or a DCD Test Client Application

- One or several transport technologies like on protocol stack below.
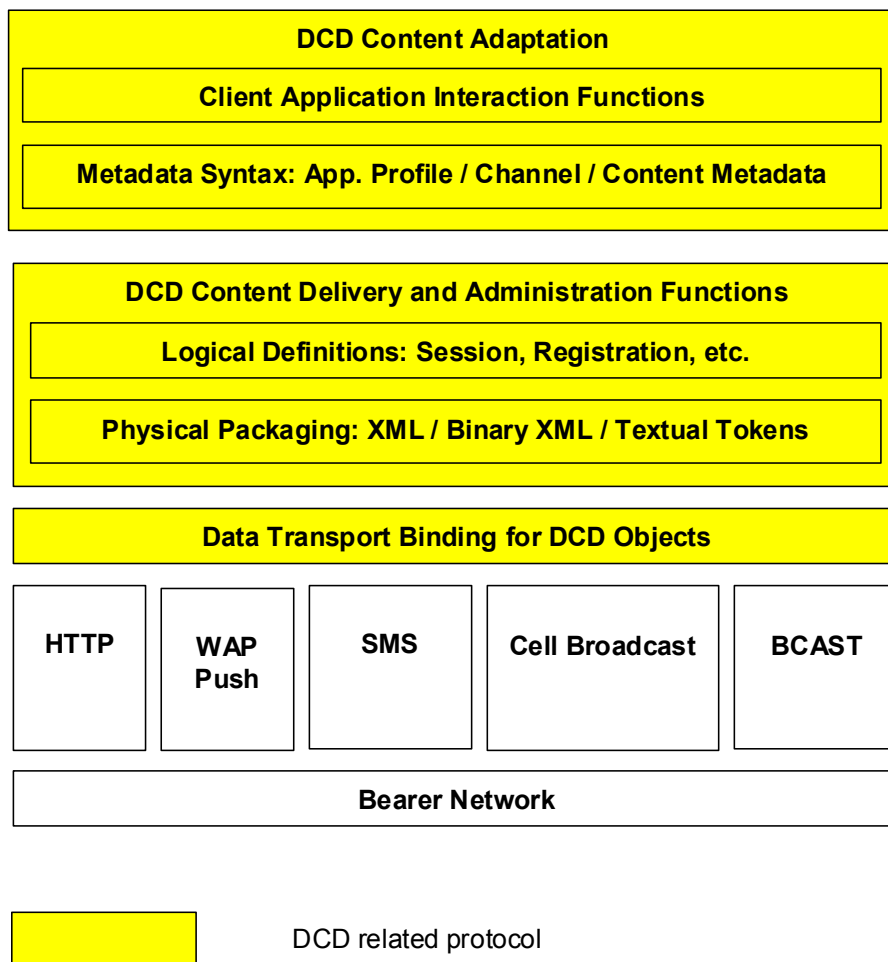
Figure 1: DCD Enabler Protocol Stack

5.1.2 Minimal Participation Guidelines

The minimum number of participants for a test fest session is:

- 2 DCD clients

- 1 DCD servers

5.1.3 Optimal TestFest Achievement Guidelines

The ETS Test Cases listed below represent a subset of all the Test Cases for the Enabler that it is thought can be executed in a test session at an OMA TestFest. This list is intended to facilitate maximum test coverage of the functionality of the enabler within a test session. It is not intended to be the only tests executed at a TestFest, and teams are encouraged to execute more tests if they are able to do in the time allowed.

Description	Test Case Id	Priority
Client Activation	DCD-1.0-int-001	**High**
Client Deactivation	DCD-1.0-int-002	**High**
Application Registration	DCD-1.0-int-010	**High**
Internal Subscription	DCD-1.0-int-020	**High**
Internal Unsubscription	DCD-1.0-int-021	**High**
Scheduled Content Update Request	DCD-1.0-int-030	**High**
On-Demand Content Update Request	DCD-1.0-int-031	**High**
Confirmed Content Update Request	DCD-1.0-int-032	**High**
Content Item Retrieval by Content Id	DCD-1.0-int-033	**High**
Content Item Retrieval by Content Address	DCD-1.0-int-034	**High**
Aux Content Item Retrieval	DCD-1.0-int-035	**High**
Content Item Replacement	DCD-1.0-int-036	**High**
Content Update Notification	DCD-1.0-int-040	**High**
Content Update Push	DCD-1.0-int-041	**High**
Content Submission With Content Response	DCD-1.0-int-050	**High**
Content Submission With Confirmation	DCD-1.0-int-051	**High**
Channel Discovery Notification	DCD-1.0-int-060	**High**
Channel Discovery Push	DCD-1.0-int-061	**High**
Charging-Related Channel Metadata Handling in Channel Discovery	DCD-1.0-int-070	**High**
Charging-Related Channel Metadata Handling in Internal Subscription	DCD-1.0-int-071	**High**
Charging-Related Content Metadata Handling	DCD-1.0-int-073	**High**
DCD-Provided Storage	DCD-1.0-int-130	**High**

Table 1: Listing of Tests Case priorities

5.2 Enabler Test Requirements

5.2.1 Test Infrastructure Requirements

The diagram below details the test infrastructure required to test the enabler.
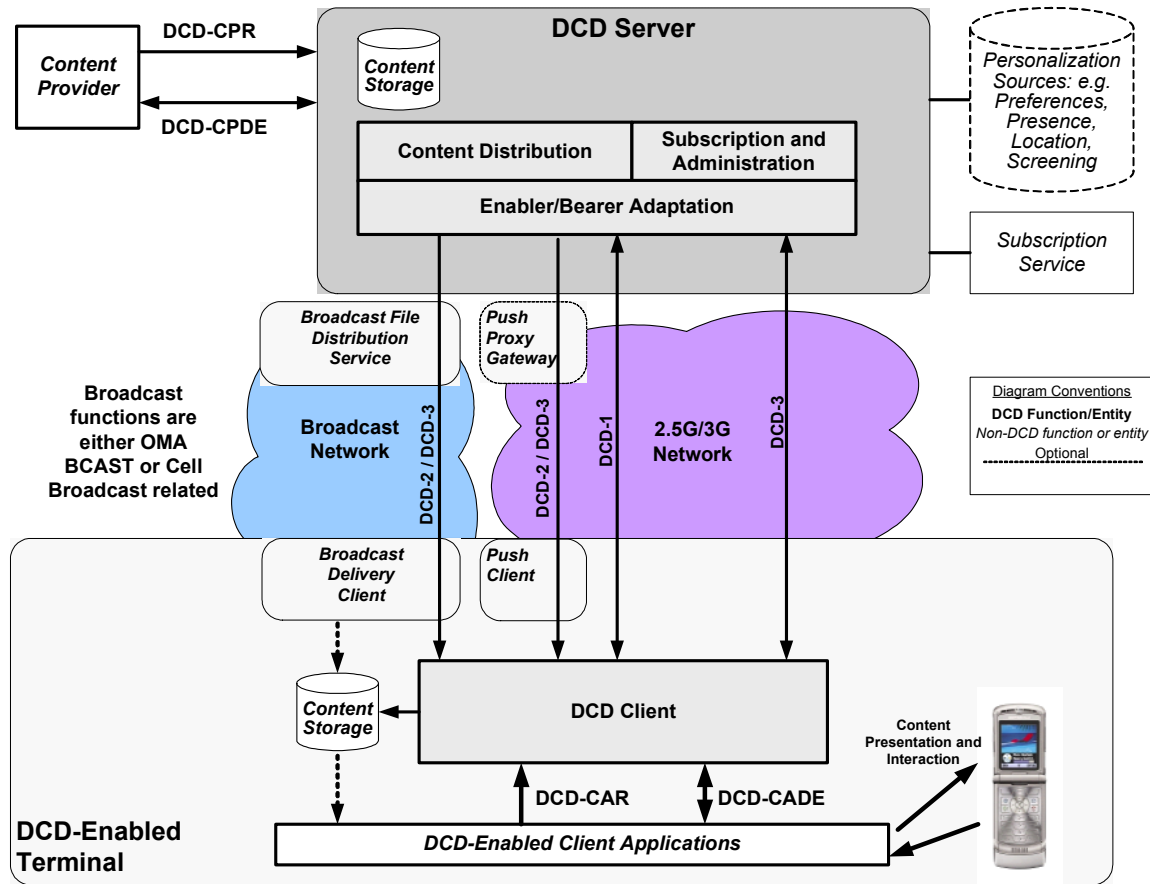
Figure 2: DCD Test environment

Fundamental equipment is:

- A HTTP capable infrastructure with IP connectivity via Ethernet, Wi-Fi or UMTS/GPRS;

- A WAP Push Server with DCD support, for DCD Servers without native OMA Push-OTA protocol support

-

Optional equipment is:

- A Cell Broadcast Server with DCD support, for testing of DCD Servers or DCD Clients supporting DCD over Cell Broadcast

- A BCAST transport infrastructure with DCD support, for testing of DCD Servers or DCD Clients supporting DCD over Cell Broadcast

5.2.2   Enabler Execution Flow

The DCD service lifecycle is is illustrated below. Note this is a non-normative diagram, intended to illustrate typical entity relationships and operations over the duration of an arbitrary DCD-enabled service.
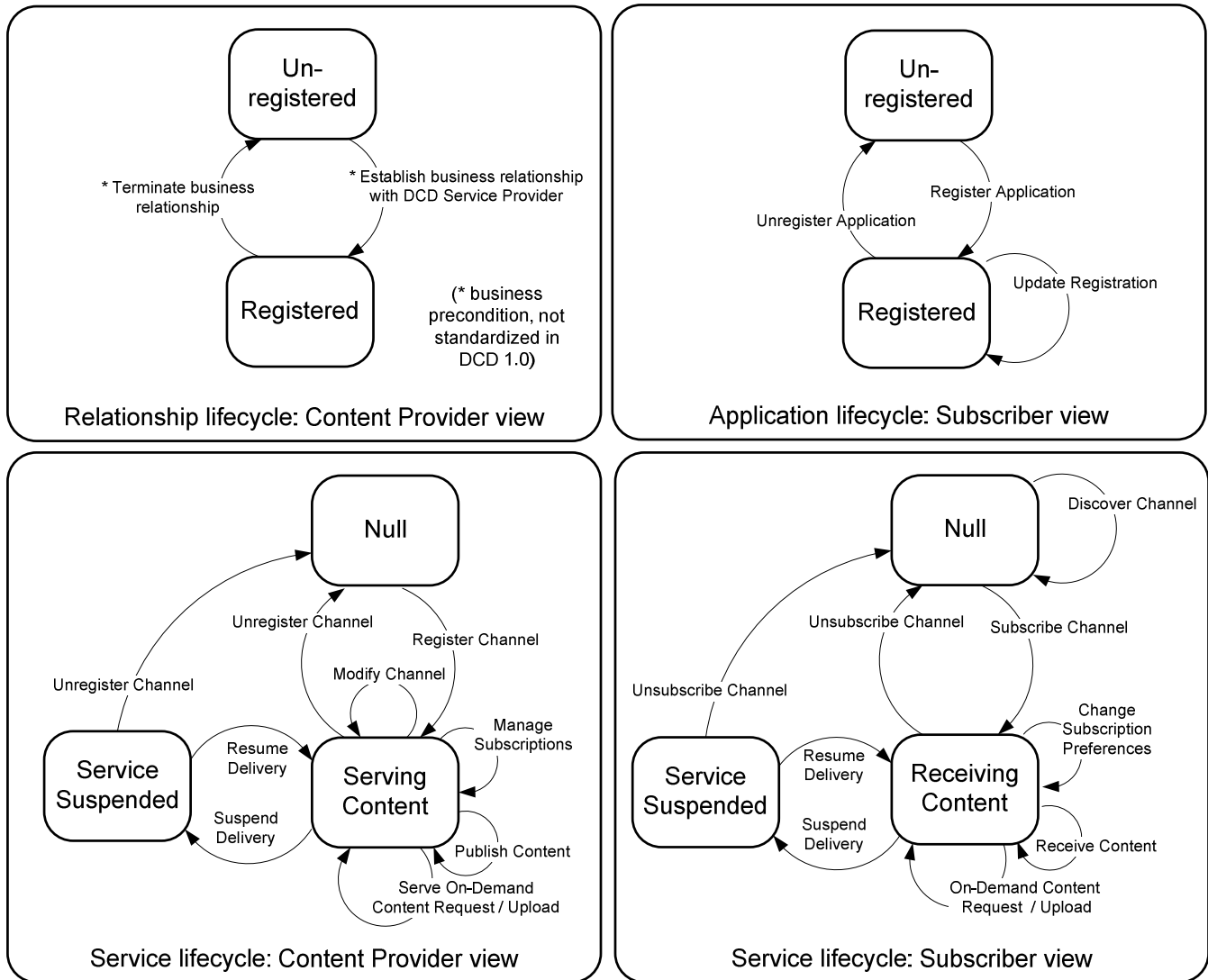
Figure 3: DCD Service Lifecycle

The following table identifies the messages flows between the DCD enabler internal entities (DCD Client, DCD Server) and external entities (Content Provider, DCD Enabled Client Application) as related to the interfaces exposed/used by the entities.

	CAR/CADE		DCD-1/DCD-2/DCD-3						CPR/CPDE	
Operation	Pull	Push	Pull	Push			Notification		Pull	Push
			PTP	PTP	Broadcast		PTP	Broadcast		
DCD Client Activation	-	-	X	X	X		-	-	-	-
DCD Client Deactivation	-	-	X	X	X		-	-	-	-
Application Registration	X	-	X	-	-		-	-	-	-
Application Deregistration	X	-	X	-	-		-	-	-	-

Channel Discovery	X	X	X	X	X	X	X	-	-
Channel Subscription	X	X	X	-	-	X	X	X	X
Channel Un-subscription	X	X	X	-	-	X	X	X	-
Subscription Update	X	-	-	-	-	-	-	-	X
Channel Suspend	X	X	X	-	-	X	X	X	X
Channel Resume	X	X	X	-	-	X	X	X	X
Content Delivery	X	X	X	X	X	X	X	X	X
Content Submission	X	-	X	-	-	-	-	X	-
Content Repair	-	-	X	-	-	-	-	-	-
Usage Tracking Report	-	-	X	-	-	X	X	X	X
Contextual Information Upload	-	-	X	-	-	X	X	-	-
Channel Registration	-	-	-	-	-	-	-	X	X
Channel Metadata Update	-	X	-	X	X	-	-	-	-
Channel Deregistration								X	X
Connection Profile Update				X	X				

Table 2 DCD Operation-Interface mapping

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5.2.3   Test Content Requirements

It will be made the best effort in order to provide test content for a consistent execution of the available test cases. On the event of not having the content, the test fest participants will have to agree the test content to use.

5.2.4   Test Limitations

5.2.4.1   Physical

As long as the infrastructure resources identified above are available at least remotely, no physical limitations are known.

5.2.4.2   Resources

The lack of any of the transport infrastructures referred in 5.2.1 will avoid the applicable test cases to be executed. It can happen that some test cases will never have the necessary conditions to be executed.

5.2.5   Test Restrictions

None to the knowledge of the authors.

5.2.6   Test Tools

If possible the following tools will be provided as test tools required for the Test Fest:

- A DCD Test Content Provider

- A DCD Test Client Application

Although not predicted initially to have a conformance program it might be made available:

- Client Conformance Test Tool

- Server Conformance Test Tool

5.2.6.1   Existing Tools to be used

Optionally and in case of communication problems it is recommended to use a network analyzer like Wireshark (formerly called Ethereal) to create traces for trouble shooting.

5.2.6.2   Test Tool Requirements

DCD defines a set of interfaces via which the DCD Client and DCD Server interact to support DCD-enabled services. The DCD-enabled services and content are as defined by Content Providers (CP), and consumed by DCD Enabled Client Applications (DECA). In order to exercise the DCD functions as they are intended to operate, test drivers/support will be needed on both the CP and DECA sides. The main purpose of a test driver is to be the trigger for execution of specific test scenarios that validate DCD Client and DCD Server functions and DCD-internal interfaces. The test drivers would not need to be a full implementation of an example CP application or DECA, or necessarily use the specific external interfaces defined in DCD. The requirements for these test drivers should be further analyzed in the IOP phase, e.g. considering these approaches:

- Internal vs external test drivers: either or both of the following could be used in an IOP test

    o External: Test drivers are developed for both the CP and DECA sides, to execute specific test scenarios using pre-defined DCD external interface messages (or a functionally equivalent abstraction of the interfaces/messages), including channel/content metadata and content. In this case, such test drivers may be collaboratively developed by OMA in the IOP process, using submissions by supporting companies. This would enable product vendors to focus on implementation rather than test drivers.

    o Internal: IOP-submitted DCD Clients and DCD Servers include test drivers provided by the submitting vendor, in compliance with pre-defined test scenarios based upon specific channel/content metadata and content.

- On the CP side, test drivers can be developed as server applications, e.g. using Javascript.

- On the device side, external test drivers may need to be adapted to the specific execution environment supported by the vendor, so the test driver development should probably use a language that is easy to port between environments.

5.3   Resources Required

For the test fest the minimum number of resources is one for the client and one for the server.

5.4   Tests to be performed

The following sections describe the tests related to the formal TestFest validation activities.

5.4.1   Entry Criteria for TestFest

The following tests need to be performed and passed by implementations by members wishing to participate in the TestFest. This ensures minimal requisite capability of the implementations. The tests are defined in the ETS [IOPETS] and any special comments are noted.

Test Case Id	Test Description	Special Conditions
DCD-1.0-int-001	Client Activation	
DCD-1.0-int-010	Application Registration	
DCD-1.0-int-020	Internal Subscription	
DCD-1.0-int-030	Scheduled Content Update Request	
DCD-1.0-int-040	Content Update Notification	
DCD-1.0-int-041	Content Update Push	
DCD-1.0-int-050	Content Submission With Content Response	
DCD-1.0-int-060	Channel Discovery Notification	
DCD-1.0-int-061	Channel Discovery Push	
DCD-1.0-int-130	DCD-Provided Storage	

Table 3: Listing of Tests for Entry Criteria for TestFest

5.4.2   Testing to be performed at TestFest

The following tests need to be performed to fully cover the range of capabilities of the enabler and defined protocols. These tests are to be covered in the TestFest. The tests are defined in the ETS [IOPETS] and any special comments are noted.

Test Case Id	Test Description	Special Conditions
DCD-1.0-int-001	Client Activation	
DCD-1.0-int-002	Client Deactivation	
DCD-1.0-int-010	Application Registration	
DCD-1.0-int-020	Internal Subscription	
DCD-1.0-int-021	Internal Unsubscription	
DCD-1.0-int-030	Scheduled Content Update Request	
DCD-1.0-int-031	On-Demand Content Update Request	
DCD-1.0-int-032	Confirmed Content Update Request	
DCD-1.0-int-033	Content Item Retrieval by Content Id	
DCD-1.0-int-034	Content Item Retrieval by Content Address	
DCD-1.0-int-035	Aux Content Item Retrieval	
DCD-1.0-int-036	Content Item Replacement	
DCD-1.0-int-040	Content Update Notification	
DCD-1.0-int-041	Content Update Push	
DCD-1.0-int-050	Content Submission With Content Response	
DCD-1.0-int-051	Content Submission With Confirmation	
DCD-1.0-int-060	Channel Discovery Notification	
DCD-1.0-int-061	Channel Discovery Push	
DCD-1.0-int-062	Channel Metadata Addition	
DCD-1.0-int-063	Channel Metadata Removal	
DCD-1.0-int-064	Channel Guide Replacement	

Test Case Id	Test Description	Special Conditions
DCD-1.0-int-065	Channel Metadata Replacement	
DCD-1.0-int-066	Channel Metadata Update	
DCD-1.0-int-070	Charging-Related Channel Metadata Handling in Channel Discovery	
DCD-1.0-int-071	Charging-Related Channel Metadata Handling in Internal Subscription	
DCD-1.0-int-072	Charging-Related Channel Metadata Handling in External Subscription	
DCD-1.0-int-073	Charging-Related Content Metadata Handling	
DCD-1.0-int-100	Connection Profile Update	
DCD-1.0-int-110	External Subscription	
DCD-1.0-int-111	External Unsubscription	
DCD-1.0-int-130	DCD-Provided Storage	
DCD-1.0-int-131	Content Decoding	
DCD-1.0-int-132	Content Expiration	
DCD-1.0-int-140	DC-initiated Suspension	
DCD-1.0-int-141	DC-initiated Resumption	
DCD-1.0-int-142	DECA-initiated Suspension	
DCD-1.0-int-143	DECA-initiated Resumption	
DCD-1.0-int-150	Usage Tracking Policy Establishment	
DCD-1.0-int-151	Usage Tracking Policy Replacement	
DCD-1.0-int-153	On-Demand Usage Tracking Report	
DCD-1.0-int-154	Policy-Based Usage Tracking Report	
DCD-1.0-int-160	On-Demand Contextual Information Upload	
DCD-1.0-int-161	Contextual Information Upload Policy Establishment	
DCD-1.0-int-162	Contextual Information Upload Policy Replacement	
DCD-1.0-int-163	Contextual Information Upload Policy Removal	
DCD-1.0-int-164	Policy-Based Contextual Information Upload	
DCD-1.0-int-170	Content Repair	Data corruption / transmission failure
DCD-1.0-int-201	Client Activation	CBS
DCD-1.0-int-210	Application Registration	CBS
DCD-1.0-int-220	Internal Subscription to CBS based 'Channel'	CBS
DCD-1.0-int-221	Internal Unsubscription from CBS based Channel	CBS
DCD-1.0-int-241	Content Update Push over CBS	CBS
DCD-1.0-int-242	DCD Concatenated Content Update Push over CBS	CBS
DCD-1.0-int-252	Channel Discovery Push over CBS	CBS
DCD-1.0-int-310	Application Registration with BCAST Access Parameters	BCAST
DCD-1.0-int-320	Internal Subscription to BCAST Delivered Channel	BCAST
DCD-1.0-int-321	Internal Unsubscription from BCAST Delivered Channel	BCAST
DCD-1.0-int-341	Content Update Push over BCAST	BCAST
DCD-1.0-int-361	Channel Discovery Push over BCAST	BCAST

Table 4: Listing of Tests to be Performed at TestFest

5.5 Enabler Test Reporting

5.5.1 Problem Reporting Requirements

Normal Reporting, no special reporting required.

5.5.2 Enabler Test Requirements

Normal Reporting, no special reporting required.

6. Alternative Validation Activities

The enabler might be validated through some bilateral test sessions or several virtual test fests. In total the number of sessions should not be smaller than the ones required to validate the enabler through normal Test Fest.

No special requirements or restrictions are applicable to these methods of validation other than the one said above.

7. Approval Criteria

The DCD 1.0 Enabler can be put in the Approved state when:

- The Enabler has been tested successfully at 3 Test Fests

- No open PRs exist.

7.1 Enabler Validation Test Cases

The following table should list the set of tests that are used for enabler validation.

Test Case Id	ETR Requirement Id	ETR Status	Notes
<Test Case Id>	<ETR Id>	<M> or <O>	
<Test Case Id>	<ETR Id>		

Table 5: Enabler Validation Test Cases

7.2 Non-Covered ETR Requirements

Any restrictions, limitations and/or infeasibility of testing of the ETR requirements should be stated in this section.

If new information about limitations and/or infeasibility of testing of any of the ETR requirements is discovered, this section should be updated accordingly.

ETR Requirement Id	ETR Status	Notes
<ETR Id>	<M> or <O>	

Table 6: Non-Covered ETR Requirements

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 1.0 History

Document Identifier	Date	Sections	Description
Draft Versions OMA-EVP-DCD-V1_0	17 Nov 2008	All	First draft
	09 Jan 2009	All	Incorporated CRs: OMA-IOP-BRO-2008-0002 OMA-IOP-BRO-2008-0003 OMA-IOP-BRO-2008-0004
	24 Jun 2009	All	Incorporated CR: OMA-IOP-BRO-2009-0075
Candidate Versions OMA-EVP-DCD-V1_0	14 Jul 2009	n/a	TP approval: OMA-TP-2009-0308-INP_DCD_1.0_EVP_for_Candidate_approval