Enabler Test Specification for DRM Enabler

Candidate Version 2.2 – 06 Dec 2011

Open Mobile Alliance

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1. Scope

This document describes in detail available test cases for OMA DRM v2.2.

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.

If either conformance or interoperability tests do not exists at the creation of the test specification this part should be marked not available.

2. References

2.1 Normative References

[DRM-v2.2]	"OMA DRM V2.2". Open Mobile Alliance[TM], OMA-DRM-DRM-V2_2, http://www.openmobilealliance.org/
[DRMCF-v2.2]	"OMA DRM Content Format V2.2", Open Mobile Alliance[TM], OMA-DRM-DCF-V2_2, http://www.openmobilealliance.org/
[DRMREL-v2.2]	"OMA DRM Rights Expression Language V2.2", Open Mobile Alliance[TM], OMA-DRM-REL-V2_2, 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

2.2 Informative References

None

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, e.g. MMS or Browsing
y.z	Version of enabler release, e.g. 1.2 or 1.2.1
'con'	Indicating this test is a conformance test case
number	Leap number for the test case

Or

xxx-y.z-int-number where:
xxx	Name of enabler, e.g. MMS or Browsing
y.z	Version of enabler release, e.g. 1.2 or 1.2.1
'int'	Indicating this test is a interoperability test case
number	Leap number for the test case

3.2 Definitions

Content	One or more Media Objects
Content Issuer	The entity that makes Content available to the DRM Agent in a Device.
Device	The entity within a user-equipment that implements a DRM Agent. The Device is also conformant to OMA DRM specifications.
DRM Agent	The entity in the Device that manages Permissions for Media Objects on the Device.
Media Object	A digital work e.g. a ringing tone, a screen saver, a Java game or a Composite Object.
Permission	Actual usages or activities allowed (by the Rights Issuer) over Protected Content
Protected Content	Media Objects that are consumed according to a set of Permissions in a Rights Object.
Rights Issuer	An entity that issues Rights Objects to OMA DRM Conformant Devices.
Rights Object	A collection of Permissions and other attributes which are linked to Protected Content.
ROAP Trigger	An XML document including a URL that, then received by the Device, initiates the ROAP.

3.3 Abbreviations

CEK	Content Encryption Key
DCF	DRM Content Format
DRM	Digital Rights Management
OMA	Open Mobile Alliance
MPEG2DCF	MPEG-2 transport stream profile of DRM Content Format
REL	Rights Expression Language
RI	Rights Issuer
RO	Rights Object

ROAP   Rights Object Acquisition Protocol

SCR   Static Conformance Requirement

4. Introduction

The purpose of this document is to provide test cases for DRM Enabler Release 2.2.

The implementation of some features is optional for the Clients and/or the Servers in the DRM Enabler. The tests associated with these optional features are marked as "(Includes Optional Features)" in the test specification.

The following items on an overall level are needed to adequately test the DRM Enabler:

- o A Content Issuer configured to support:

  - application/vdn.oma.drm.dcf (DRM Content Format)

  - application/spd (Session Description Protocol)

- o A Rights Issuer configured to support:

  - application/vnd.oma.drm.ro+xml (DRM Rights Object)

  - application/vdn.oma.drm.roap-pdu+xml (DRM ROAP PDUs)

  - application/vdn.oma.drm.roap-trigger+xml (DRM ROAP Trigger)

- o An object-packaging tool capable of packaging content to DCF and MPEG2DCF

  - A streaming server and client to support MPEG-2 streaming of MPEG2DCF files

  - A push proxy gateway for delivering ROAP Triggers and Rights Objects to the mobile device

It is expected that server vendors attending OMA DRM 2.2 Test Fests are capable of acting as both Content Issuers and Rights Issuers and their product will contain an appropriate portal to fulfil these tasks. If the pre-requisite for a test case is that there is a DCF stored on the terminal, then these DCFs will be packaged and delivered by the server vendors. Content Issuers must be able to handle a variety of media formats and should allow client testers to provide their own test content. Server vendors supporting MPEG2DCF test cases are expected to provide MPEG-2 streaming server.

Most test cases involve downloading a DRM Rights Object. Within every Rights Object at least one <permission> is usually specified. The test cases do not specify which permission should be used for each test case. The selected permission is depended on the Content format selected to execute the test.

5. DRM Conformance Test Cases

No conformance test cases were produced for DRM version 2.2.

6. DRM Interoperability Test Cases

6.1 DRM-2.2-int-001 (Includes Optional Features)

Test Case ID	DRM-2.2-int-1
Test Object	DRM Agent, RI Server
Test Case Description	To test the <playout> requirement for a DCF.
Specification Reference	[DRMREL-v2.2] Section 5.5.4.1
SCR Reference	DRM-REL-GEN-C-043, DRM-REL-GEN-C-044, DRM-REL-GEN-C-045, DRM-REL-GEN-C-048 DRM-REL-GEN-S-019, DRM-REL-GEN-S-024, DRM-REL-GEN-S-025, DRM-REL-GEN-S-028
ETR Reference	REL-003, REL-004, REL-007
Tools	None
Test Code	None

Preconditions	• Equipment:
	    o One terminal with a DRM Agent.
	    o One RI Server.
	 • State:
	    o There is a multi-part DCF stored on the terminal. DCF consists of two DRM containers: one for the normal content and one for its associated advertisement content.
	    o The RI has issued an RO containing only a permission to play normal content with an associated <playout> requirement (for the advertisment content).
	    o There is no same entry as the RO in replay cache on the DRM Agent.

Test Procedure	User requests a RO for the DCF residing on the terminal. User tries to use the DCF.
Pass-Criteria	RI and DRM Agent successfully complete the 2-pass ROAP and the RO is delivered successfully to the DRM Agent. The DRM Agent allows accessing the DCF according to the permission in the RO only after showing the advertisement content to the user. The advertisement content cannot be skipped or fastforwarded within the enforcement duration period specified by <playout> requirement.

Table 1: Test Information for 001 Interoperability Test

6.2   DRM-2.2-int-002 (Includes Optional Features)

Test Case ID	DRM-2.2-int-2
Test Object	DRM Agent, RI Server
Test Case Description	To test the <displayout> requirement for a DCF.
Specification Reference	[DRMREL-v2.2] Section 5.5.4.2
SCR Reference	DRM-REL-GEN-C-043, DRM-REL-GEN-C-044, DRM-REL-GEN-C-046, DRM-REL-GEN-C-048 DRM-REL-GEN-S-019, DRM-REL-GEN-S-024, DRM-REL-GEN-S-026, DRM-REL-GEN-S-028
ETR Reference	REL-003, REL-005, REL-007
Tools	None
Test Code	None

Preconditions	• Equipment:
	    o One terminal with a DRM Agent.
	    o One RI Server.
	• State:
	    o There is a multi-part DCF stored on the terminal. DCF consists of two DRM containers: one for the normal content and one for its associated advertisement content.
	    o The RI has issued an RO containing only a permission to display normal content with an associated <displayout> requirement (for the advertisment content).
	    o There is no same entry as the RO in replay cache on the DRM Agent.

Test Procedure	User requests a RO for the DCF residing on the terminal. User tries to use the DCF.
Pass-Criteria	RI and DRM Agent successfully complete the 2-pass ROAP and the RO is delivered successfully to the DRM Agent. The DRM Agent allows accessing the DCF according to the permission in the RO only after showing the advertisement content to the user. The advertisement content cannot be skipped within the enforcement duration period specified by <displayout> requirement.

Table 2: Test Information for 002 Interoperability Test

6.3   DRM-2.2-int-003 (Includes Optional Features)

Test Case ID	DRM-2.2-int-3
Test Object	DRM Agent, RI Server
Test Case Description	To test the <executeout> requirement for a DCF.
Specification Reference	[DRMREL-v2.2] Section 5.5.4.3
SCR Reference	DRM-REL-GEN-C-043, DRM-REL-GEN-C-044, DRM-REL-GEN-C-047 DRM-REL-GEN-S-019, DRM-REL-GEN-S-024, DRM-REL-GEN-S-027
ETR Reference	REL-003, REL-006
Tools	None
Test Code	None

Preconditions	• Equipment:
	     o One terminal with a DRM Agent.
	     o One RI Server.
	 • State:
	     o There is a multi-part DCF stored on the terminal. DCF consists of two DRM containers: one for the normal content and one for its associated advertisement content.
	     o The RI has issued an RO containing only a permission to execute normal content with an associated <executeout> requirement (for the advertisment content).
	     o There is no same entry as the RO in replay cache on the DRM Agent.

Test Procedure	User requests a RO for the DCF residing on the terminal. User tries to use the DCF.
Pass-Criteria	RI and DRM Agent successfully complete the 2-pass ROAP and the RO is delivered successfully to the DRM Agent. The DRM Agent allows accessing the DCF according to the permission in the RO only after executing the advertisement content.

Table 3: Test Information for 003 Interoperability Test

6.4 DRM-2.2-int-004 (Includes Optional Features)

Test Case ID	DRM-2.2-int-4
Test Object	DRM Agent, RI Server
Test Case Description	To test the <playout> requirement with <enforcement-count> parameter for a DCF.
Specification Reference	[DRMREL-v2.2] Section 5.5.4.1, Section 5.5.4.5
SCR Reference	DRM-REL-GEN-C-043, DRM-REL-GEN-C-044, DRM-REL-GEN-C-045, DRM-REL-GEN-C-048, DRM-REL-GEN-C-049 DRM-REL-GEN-S-019, DRM-REL-GEN-S-024, DRM-REL-GEN-S-025, DRM-REL-GEN-S-028, DRM-REL-GEN-S-029
ETR Reference	REL-003, REL-004, REL-007, REL-008
Tools	None
Test Code	None

Preconditions	• Equipment:
	    o One terminal with a DRM Agent.
	    o One RI Server.
	• State:
	    o There is a multi-part DCF stored on the terminal. DCF consists of two DRM containers: one for the normal content and one for its associated advertisement content.
	    o The RI has issued an RO containing only a permission to play normal content with an associated <playout> requirement (for the advertisment content).
	    o There is no same entry as the RO in replay cache on the DRM Agent.
	• Continuation of:
	    o DRM-2.2-int-001

Test Procedure	User requests a RO for the DCF residing on the terminal. User tries to use the DCF.
Pass-Criteria	RI and DRM Agent successfully complete the 2-pass ROAP and the RO is delivered successfully to the DRM Agent. The DRM Agent allows accessing the DCF according to the permission in the RO only after showing the advertisement content to the user N times as specified by the <enforcement-count> element.

Table 4: Test Information for 004 Interoperability Test

6.5   DRM-2.2-int-005 (Includes Optional Features)

Test Case ID	DRM-2.2-int-5
Test Object	DRM Agent, RI Server
Test Case Description	To test the <discrete> constraint for a DCF.
Specification Reference	[DRMREL-v2.2] Section 5.6.9
SCR Reference	DRM-REL-GEN-C-043, DRM-REL-GEN-C-044, DRM-REL-GEN-C-045, DRM-REL-GEN-C-048, DRM-REL-GEN-C-051 DRM-REL-GEN-S-019, DRM-REL-GEN-S-024, DRM-REL-GEN-S-025, DRM-REL-GEN-S-028, DRM-REL-GEN-S-031
ETR Reference	REL-003, REL-004, REL-007, REL-010
Tools	None
Test Code	None

Preconditions	• Equipment:
	     o One terminal with a DRM Agent.
	     o One RI Server.
	• State:
	     o There is a DCF stored on the terminal containing the normal content (e.g. a movie file).
	     o There is a multi-part DCF on the terminal containing a set of advertisement contents.
	     o The RI has issued an RO containing only a permission to play normal content with an associated <playout> requirement (linked to the advertisment content) and an associated <discrete> constraint.
	     o There is no same entry as the RO in replay cache on the DRM Agent.
	• Continuation of:
	     o DRM-2.2-int-001

Test Procedure	User requests a RO for the DCF residing on the terminal. User tries to use the DCF.
Pass-Criteria	RI and DRM Agent successfully complete the 2-pass ROAP and the RO is delivered successfully to the DRM Agent. The DRM Agent pauses the consumption of the normal content every N seconds as specified by the <disrete> constraint and shows the advertisement to the user as specified by the <playout> requirement. After the advertisement has been played out, consumption of the normal content is resumed.

Table 5: Test Information for 005 Interoperability Test

6.6 DRM-2.2-int-006 (Includes Optional Features)

Test Case ID	DRM-2.2-int-6
Test Object	DRM Agent, RI Server
Test Case Description	To test the <access> permission with <access-code> requirement for a DCF.
Specification Reference	[DRMREL-v2.2] Section 5.5.3, 5.4.1, 5.4.7
SCR Reference	DRM-REL-GEN-C-041, DRM-REL-GEN-C-042 DRM-REL-GEN-S-022, DRM-REL-GEN-S-023
ETR Reference	REL-001, REL-002
Tools	None
Test Code	None

Preconditions	• Equipment:
	    o One terminal with a DRM Agent.
	    o One RI Server.
	• State:
	    o There is a multi-part DCF stored on the terminal. DCF consists of two DRM containers: one for the executable content (game) and one for its associated content (additional features).
	    o The RI has issued an RO containing <execute> permission to execute the game without any restrictions. RO also contains <access> permission linked to the additional game features. <access> permission contains <access-code> requirement.
	    o There is no same entry as the RO in replay cache on the DRM Agent.

Test Procedure	User requests a RO for the DCF residing on the terminal. User tries to use the DCF.
Pass-Criteria	RI and DRM Agent successfully complete the 2-pass ROAP and the RO is delivered successfully to the DRM Agent. The DRM Agent allows accessing the DCF according to the <execute> permission. The DRM Agent prompts for an access code when game (a user inside the game) tries to excersise <access> permission. The DRM Agent allows accessing the DCF accoding to the <access> permission when associated access-code is entered correctly.

Table 6: Test Information for 006 Interoperability Test

6.7   DRM-2.2-int-007 (Includes Optional Features)

Test Case ID	DRM-2.2-int-7
Test Object	DRM Agent, RI Server
Test Case Description	To test MPEG2DCF format: requesting RO for MPEG2DCF
Specification Reference	[DRMCF-v2.2] Section 8.2
SCR Reference	DRM-CLI-202, DRM-CLI-203, DRM-CLI-206
ETR Reference	MPEG2DCF-001, MPEG2DCF-003
Tools	None
Test Code	None

Preconditions	• Equipment:
	    o One terminal with a DRM Agent.
	    o One RI Server.
	• State:
	    o There is a MPEG2DCF stored on the terminal.
	    o RI has issued an RO containing <play> permission to render MPEG-2 transport stream without any restrictions.
	    o There is no same entry as the RO in replay cache on the DRM Agent.

Test Procedure	User requests and receives the RO for the MPEG-2 transport stream in MPEG2DCF format.
Pass-Criteria	The DRM Agent properly parses the MPEG2DCF (i.e. CA descriptor and associated EMMs) and extracts information that is necessary to request the RO. RI and DRM Agent successfully complete the 2-pass ROAP and the RO is delivered successfully to the DRM Agent.

Table 7: Test Information for 007 Interoperability Test

6.8 DRM-2.2-int-008 (Includes Optional Features)

Test Case ID	DRM-2.2-int-8
Test Object	DRM Agent, MPEG2DCF streaming server
Test Case Description	To test the MPEG2DCF format: descrambling of MPEG2DCF
Specification Reference	[DRMCF-v2.2] Section 8.2
SCR Reference	DRM-CLI-201, DRM-CLI-202, DRM-CLI-203, DRM-CLI-204
ETR Reference	MPEG2DCF-001, MPEG2DCF-002
Tools	None
Test Code	None

Preconditions	• Equipment:
	    o One terminal with a DRM Agent.
	    o One RI Server
	• State:
	    o There is a MPEG2DCF stored on the terminal.
	    o RI has issued an RO containing <play> permission to render MPEG-2 transport stream without any restrictions.
	    o There is no same entry as the RO in replay cache on the DRM Agent.
	• Continuation of:
	    o DRM-2.2-int-007

Test Procedure	User tries to render MPEG-2 transport stream received in MPEG2DCF format.
Pass-Criteria	The DRM Agent correctly parses MPEG2DCF and descrambles MPEG-2 transport stream in MPEG2DCF format.

Table 8: Test Information for 008 Interoperability Test

6.9   DRM-2.2-int-009 (Includes Optional Features)

Test Case ID	DRM-2.2-int-9
Test Object	DRM Agent, RI Server
Test Case Description	To test the enforced playout of advertisements with MPEG2DCF format (content_control_information access criteria descriptor testing)
Specification Reference	[DRMCF-v2.2] Section 8.2.4.1.1
SCR Reference	DRM-CLI-201, DRM-CLI-202, DRM-CLI-203, DRM-CLI-204, DRM-CLI-205
ETR Reference	MPEG2DCF-001, MPEG2DCF-002, MPEG2DCF-004
Tools	None
Test Code	None

Preconditions	• Equipment:
	  o One terminal with a DRM Agent.
	  o RI Server
	• State:
	  o There is a MPEG2DCF stored on the terminal.
	  o Key Stream Message ECMs in MPEG2DCF contain one or more content_control_information access criteria descriptors.
	  o MPEG-2 stream contains advertisement content inserted immediately after content_control_information access criteria descriptor with lock_control_bit set to "1". Advertisement content ends immediately after next content_control_information access criteria descriptor with lock_control_bit set to "0".
	  o RI has issued an RO containing <play> permission to render MPEG-2 transport stream without any restrictions.
	  o There is no same entry as the RO in replay cache on the DRM Agent.
	• Continuation of:
	  o DRM-2.2-int-008

Test Procedure	1. User requests a RO for the MPEG2DCF residing on the terminal. 2. User tries to use the MPEG2DCF 3. User tries to fast forward the content. 4. Advertisement content shows up. User tries to fast forward the advertisement. 5. After advertisement content has been played out, user tries to fast forward again.
Pass-Criteria	The DRM Agent allows fast forwarding of the normal content. The DRM Agent prohibits fast forwarding of the advertisement content. After advertisement content has been played out, the DRM Agent enables fast forwarding again.

Table 9: Test Information for 009 Interoperability Test

6.10 DRM-2.2-int-010 (Includes Optional Features)

Test Case ID	DRM-2.2-int-10
Test Object	DRM Agent, RI Server
Test Case Description	To test the enforced playout of advertisements with MPEG2DCF format (Enforced Advertising Service ECM testing)
Specification Reference	[DRMCF-v2.2] Section 8.2.4.5
SCR Reference	DRM-CLI-201, DRM-CLI-202, DRM-CLI-203, DRM-CLI-204, DRM-CLI-205
ETR Reference	MPEG2DCF-001, MPEG2DCF-002, MPEG2DCF-005
Tools	None
Test Code	None
Preconditions	- Equipment: - One terminal with a DRM Agent. - One RI Server. - State: - There is a MPEG2DCF stored on the terminal. - RI has issued an RO containing <play> permission to render MPEG-2 transport stream without any restrictions. - There is no same entry as the RO in replay cache on the DRM Agent. - MPEG2DCF contains Enforced Advertising Service ECM - ECM contains asset ID of the advertisement content stored on the Device in another MPEG2DCF or DCF file. - policy() indicates that advertisement is to be played for 15 seconds. - Continuation of: - DRM-2.2-int-008
Test Procedure	User requests a RO for the MPEG2DCF residing on the terminal. User tries to use the MPEG2DCF.
Pass-Criteria	RI and DRM Agent successfully complete the 2-pass ROAP and the RO is delivered successfully to the DRM Agent. The DRM Agent shows 15 seconds advertisement to the user when Enforced Advertising Service ECM is received while rendering the MPEG2DCF.

Table 10: Test Information for 010 Interoperability Test

6.11 DRM-2.2-int-011 (Contains Optional Features)

Test Case ID	DRM-2.2-int-11
Test Object	DRM Agent, RI Server
Test Case Description	To test the metering report for enforced advertisements.
Specification Reference	[DRM-v2.2] Section 11
SCR Reference	DRM-CLI-CMN-068, DRM-CLI-CMN-077, DRM-SERVER-036, DRM-SERVER-043
ETR Reference	METR-001, REL-03, REL-016
Tools	None
Test Code	None

Preconditions	• Equipment:
	    o One terminal with a DRM Agent.
	    o One RI Server.
	• State:
	    o There is a multi-part DCF stored on the terminal (DCF contains normal content and associated advertisements content).
	    o RI has issued an RO containing \<AdvertisementsPolicy\> requirements and \<tracked\> element.
	    o There is no same entry as the RO in replay cache on the DRM Agent.

Test Procedure	User tries to use the DCF for the duration of normal content.
Pass-Criteria	DRM Agent collects metering information while content (normal and advertisement) is consumed. DRM Agent sends metering report to the RI. RI validates the report and stores advertisement metering information that can be viewed through the RI portal.

Table 11: Test Information for 011 Interoperability Test

Appendix A.   Change History   (Informative)

A.1   Approved Version History

Reference	Date	Description
n/a	n/a	n/a

A.2   Draft/Candidate Version 2.2 History

Document Identifier	Date	Sections	Description
Draft Versions OMA-ETS-DRM-V2_2	01 Feb 2011	all	Baseline document
	10 Apr 2011	6	Changes according to OMA-IOP-BRO-2011-0018-INP_DRM_2.2_test_cases_vol.1
	27 Jun 2011	6	Changes accoding to OMA-IOP-BRO-2011-0030-CR_DRM_22_test_cases_vol_2
	06 Jul 2011	6	Changes according to OMA-IOP-BRO-2011-0061-CR_Additional_test_case_for_DRM_22
	21 Nov 2011	5	Editorial changes
Candidate Versions OMA-ETS-DRM-V2_2	06 Dec 2011	n/a	Status changed to Candidate by TP TP Ref# OMA-TP-2011-0421-INP_DRM_v2_2_ETS_for_Candidate_Approval