

Enabler Test Specification for DM Scheduling

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1. Scope

This document describes in detail available test cases for the DM Scheduling Enabler Release 1.0 (http://www.openmobilealliance.org).

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

[AD] "DM Scheduling Architecture Document", Version 1.0, Open Mobile Alliance™, OMA-AD-

DM Scheduling-V1 0, <u>URL:http://www.openmobilealliance.org/</u>

[ERELD] "Enabler Relese Document for DM Scheduling", Version 1.0, Open Mobile Alliance™,

OMA-ERELD-DM Scheduling-V1 0, <u>URL:http://www.openmobilealliance.org/</u>

[RFC2119] "Key words for use in RFCs to Indicate Requirement Levels", S. Bradner, March 1997,

URL:http://www.ietf.org/rfc/rfc2119.txt

[TS] "DM Scheduling Technical Specification", Version 1.0, Open Mobile Alliance™, OMA-TS-

DM Scheduling-V1 0, URL:http://www.openmobilealliance.org/

2.2 Informative References

[OMADICT] "Dictionary for OMA Specifications", Version 2.7, Open Mobile AllianceTM,

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.

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

DM Client An abstract software component in a Device implementation that conforms to the OMA Device

Management 1.2 Enabler static conformance requirements specified for DM Clients. It servers as an endpoint of the DM Client-Server Protocols including the one described in this architecture document.

DM Server An abstract software component in a deployed Device Management infrastructure that conforms to the

OMA Device Management 1.2 Enabler static conformance requirements specified for DM Servers. It servers as an end-point of the DM Client-Server Protocols including the one described in this architecture

document.

Schedule A collection of information which contains a list of scheduled management tasks, the condition specifying

when those scheduled tasks are supposed to be executed, user interaction specifications, and status

reporting specifications.

Status Reporting It is the sending of Generic Alert to the DM server to inform the interested events occurred in the Device

with regards to the Schedules under the control of the server.

Trap The event that is generated by various sources in the Device which the Device Management System would

be interested to know. The Trap source includes for example Radio Software, other OMA Enablers, or

device drivers.

3.3 Abbreviations

DM Device Management

HTTP Hyper Text Transmission Protocols

MO Management Objects
OMA Open Mobile Alliance

SCTS SyncML Conformance Test Suite

4. Introduction

The purpose of this document is to provide test cases for the DM Scheduling Enabler Release 1.0.

The implementation of some features is optional for the Clients and/or the Servers in the DM Scheduling 1.0 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 DM Scheduling 1.0 Enabler:

- A DM Client in the mobile device that is configured to interact with a DM Server
- A DM Server capable of accessing and setting the DM Scheduling Management Objects (MO) in a mobile device, if necessary
- An SCTS (SyncML Conformance Test Suite), if necessary

Detailed information will be included in the specific test case descriptions.

The DM Scheduling 1.0 Enabler tests are carried out using OMA DM 1.2 protocols. The transport protocols used are HTTP.

5. DM Scheduling 1.0 Enabler Conformance Test Cases

Not available.

6. DM Scheduling 1.0 Enabler Interoperability Test Cases

6.1 DMScheduling-1.0-int-001: Schedule Installation and Activation

Test Case Id	DMScheduling-1.0-int-001
Test Object	Client and Server device under test
Test Case Description	Purpose of this test case is to show compliance with the Schedule installation operation and Schedule activation.
Specification Reference	5.1, 5.1.1, 5.1.2, 7.1
SCR Reference	DMSched-SCH-C-001-M DMSched-SCH-C-002-M DMSched-BHV-C-001-M DMSched-SCH-S-001-M DMSched-BHV-S-001-M
ETR Reference	SCH-001, SCH-003
Tool	None.
Test code	None.
Preconditions	None.
Test Procedure	In the server, configure to perform installation of a Schedule and subsequent activation.
	2. Establish the connection from the client.
	3. Complete the DM session.
	4. Check the DM session goes without any errors.
	5. Check the Schedule is running successfully.
	Note: Details for the Schedule (eg, nodes and their contents and URIs) should be negotiated between client and server vendor.
Pass-Criteria	DM session runs through without any errors.
	2. Schedule is successfully installed, and is running with its operational state properly reflected by <x>/State node.</x>

6.2 DMScheduling-1.0-int-002: Schedule Deactivation and Reconfiguration

Test Case Id	DMScheduling-1.0-int-002
Test Object	Client and Server device under test
Test Case Description	Purpose of this test case is to show compliance with the Schedule reconfiguration operation and Schedule deactivation.
Specification Reference	5.1, 5.1.1, 5.1.2, 7.1
SCR Reference	DMSched-SCH-C-001-M DMSched-SCH-C-002-M DMSched-BHV-C-001-M DMSched-SCH-S-001-M DMSched-BHV-S-001-M

ETR Reference	SCH-001, SCH-003
Tool	None.
Test code	None.
Preconditions	This test case must be performed continuously after DMScheduling-1.0-int-001 because the previously Schedule will be reused.
Test Procedure	In the server, configure to perform deactivation of the previously installed Schedule followed by reconfiguration.
	2. Establish the connection from the client.
	3. Complete the DM session.
	4. Check the DM session goes without any errors.
	5. Check the Schedule is stopped.
	6. Check the Schedule is reconfigured.
	Example: Replace <x>/Trigger/Time/Base</x>
Pass-Criteria	DM session runs through without any errors.
	2. Schedule is successfully stopped and reconfigured, and its operational state is properly reflected by <x>/State node.</x>

6.3 DMScheduling-1.0-int-003: Single-shot Time-based Scheduling

Test Case Id	DMScheduling-1.0-int-003
	Divisence uning 1.0 int 003
Test Object	Client and Server device under test
Test Case Description	Purpose of this test case is to show the support for the single-shot time-based Schedule and basic scheduling operation.
Specification Reference	5.1.3.1, 5.2, 5.2.4, 5.2.6, 6
SCR Reference	DMSched-SCH-C-004-M DMSched-OPR-C-001-M DMSched-OPR-C-003-M DMSched-OPR-C-009-M DMSched-SCH-S-002-M DMSched-OPR-S-001-M
ETR Reference	SCH-002, OPR-001, OPR-002
Tool	None.
Test code	None.
Preconditions	None.

Test Procedure	1. In the server, configure to perform installation of a single-shot time-
rest roccuure	based Schedule and subsequent activation.
	2. Establish the connection from the client.
	3. Complete the DM session.
	4. At the occurrence of time trigger, client executes the scheduled task and initiates a session for the Status Reporting.
	5. Complete the DM session.
	6. Check each DM session goes without any errors.
	7. Check the time trigger occurs as scheduled.
	8. Check the scheduled task is properly executed.
	9. Check the server properly receives the Status Reporting.
	Note: Time and tasks scheduled should be negotiated between client and server vendor - make sure any gating rule that may block client session initiation is not used.
Pass-Criteria	DM session runs through without any errors.
	2. Time trigger occurs as scheduled.
	3. Scheduled task is properly executed.
	4. Status Reporting is sent and received properly.

6.4 DMScheduling-1.0-int-004: Missed Schedule

Test Case Id	DMScheduling-1.0-int-004
Test Object	Client and Server device under test
Test Case Description	Purpose of this test case is to show the compliance with respect to the missed schedule behavior.
Specification Reference	7.4
SCR Reference	DMSched-BHV-C-003-M
ETR Reference	BHV-002
Tool	None.
Test code	None.
Preconditions	None.

Test Procedure	In the server, configure to perform installation of a single-shot time-based Schedule and subsequent activation.
	• Set the <x>/ExecuteMissed node to "True," retroactive execution</x>
	2. Establish the connection from the client.
	3. Complete the DM session.
	4. Power off client for sufficient time so as to make sure time trigger is missed and then power on.
	Client detects the schedule was missed and then executes the scheduled task.
	6. Check DM session goes without any errors.
	7. Check the missed schedule is detected and retroactively executed.
	Note: Time and tasks scheduled should be negotiated between client and server vendor.
Pass-Criteria	DM session runs through without any errors.
	2. Scheduled task is executed right after power on.

6.5 DMScheduling-1.0-int-005: Missed Schedule - Ignore

Test Case Id	DMScheduling-1.0-int-005
Test Object	Client and Server device under test
Test Case Description	First purpose of this test case is to show the compliance with respect to the missed schedule behavior. Second purpose is to show the compliance with respect to the Event type Status Reporting.
Specification Reference	5.2.6, 7.4
SCR Reference	DMSched-OPR-C-010-O, DMSched-BHV-C-003-M, DMSched-BHV-C-004-M, DMSched-OPR-S-002-O
ETR Reference	BHV-002, OPR-003, OPR-002
Tool	None.
Test code	None.
Preconditions	None.

Test Procedure	1. In the server, configure to perform installation of a single-shot time-
	based Schedule and subsequent activation.
	 Set the <x>/ExecuteMissed node to "False," ignore</x>
	 Add a node at <x>/SR/Events with the value "501"</x>
	2. Establish the connection from the client.
	3. Complete the DM session.
	4. Power off client for sufficient time so as to make sure time trigger is missed and then power on.
	Client detects the schedule was missed and just reports the event to the server.
	6. Check DM session goes without any errors.
	7. Check the missed schedule is detected and reported without execution.
	Note: Time and tasks scheduled should be negotiated between client and server vendor.
Pass-Criteria	DM session runs through without any errors.
	2. Missed schedule event is reported to the server, and server received it without error.

6.6 DMScheduling-1.0-int-006: Recurrent Schedule

Test Case Id	DMScheduling-1.0-int-006
Test Object	Client and Server device under test
Test Case Description	Purpose of this test case is to show the compliance with respect to handling recurrent schedule.
Specification Reference	5.1.3.1, 6
SCR Reference	DMSched-SCH-C-005-O
ETR Reference	SCH-004
Tool	None.
Test code	None.
Preconditions	None.
Test Procedure	 In the server, configure to perform installation of a time-based Schedule with a recurrence rule specified, and subsequent activation. The schedule of Get message plus NO Gating rule is recommended (see note).
	Establish the connection from the client.
	3. Complete the DM session.
	Complete the Divi session. Check scheduled is executed recurrently.
	4. Check scheduled is executed recultently.
	Note: Other details of the Schedule should be negotiated between client and server vendor.

Pass-Criteria	DM session runs through without any errors.
	2. The scheduled task is executed recurrently as specified by the recurrent rule.

6.7 DMScheduling-1.0-int-007: Event-based Scheduling

Test Case Id	DMScheduling-1.0-int-007
Test Object	Client and Server device under test
Test Case Description	Purpose of this test case is to show the compliance with respect to event-based scheduling.
Specification Reference	5.1.3.2, 6
SCR Reference	DMSched-SCH-C-006-O
ETR Reference	SCH-005
Tool	None.
Test code	None.
Preconditions	None.
Test Procedure	In the server, configure to perform installation of an event-based Schedule and subsequent activation (see note).
	2. Establish the connection from the client.
	3. Complete the DM session.
	4. Check scheduled is executed accordingly.
	Note: Any type of Trap event that is supported by the client and easily reproduced can be used. The client vendor should inform the Trap ID to the server vendor so as to create the Schedule accordingly. Other details of the Schedule should be negotiated between client and server vendor.
Pass-Criteria	DM session runs through without any errors.
	2. The scheduled task is executed as the specified Trap event occurs.

6.8 DMScheduling-1.0-int-008: Combined Type Scheduling

Test Case Id	DMScheduling-1.0-int-008
Test Object	Client and Server device under test
Test Case Description	Purpose of this test case is to show the compliance with respect to combined type scheduling.
Specification Reference	5.1.3.3, 6
SCR Reference	DMSched-SCH-C-004-M, DMSched-SCH-C-006-O
ETR Reference	SCH-006
Tool	None.
Test code	None.
Preconditions	None.

Test Procedure	In the server, configure to perform installation of a combined type Schedule and subsequent activation (see note).
	2. Establish the connection from the client.
	3. Complete the DM session.
	4. Check scheduled is executed accordingly.
	Note: Any type of Trap event that is supported by the client and easily reproduced can be used. The client vendor should inform the Trap ID to the server vendor so as to create the Schedule accordingly. Other details of the Schedule should be negotiated between client and server vendor.
Pass-Criteria	1. DM session runs through without any errors.
	2. The scheduled task is executed both as the specified Trap event occurs and at the time point specified by the Schedule.

6.9 DMScheduling-1.0-int-009: Trigger Filtering

Test Case Id	DMScheduling-1.0-int-009
Test Object	Client and Server device under test
Test Case Description	Purpose of this test case is to show the compliance with respect to the Trigger Filtering feature.
Specification Reference	5.2.2, 6, 7.2
SCR Reference	DMSched-OPR-C-002-O, DMSched-BHV-C-002-O
ETR Reference	OPR-004
Tool	None.
Test code	None.
Preconditions	None.
Test Procedure	In the server, configure to perform installation of a Schedule with Trigger Filtering specified, and subsequent activation (see note).
	2. Establish the connection from the client.
	3. Complete the DM session.
	4. Check how schedule is running.
	Note: Configure the trigger filtering properly; set URI point to existing readable node, but set threshold with the value un-matching to the value from the node at the URI. Other details of the Schedule should be negotiated between client and server vendor.
Pass-Criteria	DM session runs through without any errors.
	Scheduled task must not be executed, because time trigger must be silently ignored.

6.10 DMScheduling-1.0-int-010: Trigger Filtering Error

Test Case Id	DMScheduling-1.0-int-010
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Test Object	Client and Server device under test
Test Case Description	Purpose of this test case is to show the compliance with respect to handling of errors from Trigger Filtering.
Specification Reference	5.2.2, 6, 7.2
SCR Reference	DMSched-BHV-C-002-O, DMSched-OPR-C-010-O, DMSched-OPR-S-002-O, DMSched-BHV-C-003-M
ETR Reference	BHV-003, OPR-003, OPR-002
Tool	None.
Test code	None.
Preconditions	None.
Test Procedure	 In the server, configure to perform installation of a Schedule with Trigger Filtering specified, and subsequent activation. Set URI node to point to non-existing node or the node to which the server doesn't have sufficient access rights (also see note).
	2. Establish the connection from the client.
	3. Complete the DM session.
	4. Check how schedule is running.
	Note: Other details of the Schedule should be negotiated between client and server vendor.
Pass-Criteria	DM session runs through without any errors.
	2. The run-time error event is reported to server.

6.11 DMScheduling-1.0-int-011: Gating

Test Case Id	DMScheduling-1.0-int-011
Test Object	Client and Server device under test
Test Case Description	Purpose of this test case is to show the compliance with respect to the Gating feature.
Specification Reference	5.2.5, 5.2.6
SCR Reference	DMSched-OPR-C-008-O
ETR Reference	OPR-005
Tool	None.
Test code	None.
Preconditions	None.

Test Procedure	 In the server, configure to perform installation of a Schedule with a Gating rule specified and subsequent activation (see note).
	2. Establish the connection from the client.
	3. Complete the DM session.
	4. Check how schedule is running.
	Note: The Schedule must be properly configured so that at least one response is gated off. Other details of the Schedule should be negotiated between client and server vendor.
Pass-Criteria	DM session runs through without any errors.
	2. Those responses that are gated off must not be sent to the server, or the entire result type Status Reporting message must not be sent to server if all responses are configured to be gated off.

6.12 DMScheduling-1.0-int-012: User Interaction - Notification

Test Case Id	DMScheduling-1.0-int-012
Test Object	Client and Server device under test
Test Case Description	Purpose of this test case is to show the compliance with respect to the localized User Interactions for Display User Notification.
Specification Reference	5.2.3
SCR Reference	DMSched-OPR-C-004-O
ETR Reference	OPR-006
Tool	None.
Test code	None.
Preconditions	None.
Test Procedure	In the server, configure to perform installation of a Schedule and subsequent activation.
	• Set <x>/UI/Notify appropriately (also see note).</x>
	2. Establish the connection from the client.
	3. Complete the DM session.
	4. Check how schedule is running, and how notification message is displayed.
	Note: Other details of the Schedule should be negotiated between client and server vendor.
Pass-Criteria	DM session runs through without any errors.
	2. The specified notification message must be displayed appropriately.

6.13 DMScheduling-1.0-int-013: User Interaction - Confirm

Test Case Id	DMScheduling-1.0-int-013
Test Object	Client and Server device under test

Test Case Description	Purpose of this test case is to show the compliance with respect to the localized User Interactions for Confirm.
Specification Reference	5.2.3
SCR Reference	DMSched-OPR-C-004-O
ETR Reference	OPR-006
Tool	None.
Test code	None.
Preconditions	None.
Test Procedure	 In the server, configure to perform installation of a Schedule and subsequent activation. Set <x>/UI/Defer to "True" (also see note).</x> Establish the connection from the client. Complete the DM session. Check if user is given with the option to give confirmation or cancel the schedule, and how the schedule runs depending on user response. Note: Other details of the Schedule should be negotiated between client and server yendor.
Pass-Criteria	 DM session runs through without any errors. User must be prompted to give a confirmation or cancel the schedule. If user cancels the schedule, the scheduled task must not be executed.

6.14 DMScheduling-1.0-int-014: User Interaction - Reschedule

Test Case Id	DMScheduling-1.0-int-014
Test Object	Client and Server device under test
Test Case Description	Purpose of this test case is to show the compliance with respect to the localized User Interactions for Reschedule.
Specification Reference	5.2.3
SCR Reference	DMSched-OPR-C-004-O
ETR Reference	OPR-006
Tool	None.
Test code	None.
Preconditions	None.
Test Procedure	In the server, configure to perform installation of a Schedule and subsequent activation.
	• Set <x>/UI/Reschedule to "True" (also see note).</x>
	2. Establish the connection from the client.
	3. Complete the DM session.
	4. Check if user is given with the option to reschedule, and how the schedule runs depending on user response.
	Note: Other details of the Schedule should be negotiated between client and server vendor.

Pass-Criteria	DM session runs through without any errors.		
	2. User must be prompted to reschedule, and the new schedule must be running accordingly to user modification.		

6.15 DMScheduling-1.0-int-015: Validity

Test Case Id	DMScheduling-1.0-int-015				
Test Object	Client and Server device under test				
Test Case Description	Purpose of this test case is to show the compliance with respect to the Validity node.				
Specification Reference	5.1				
SCR Reference	DMSched-SCH-C-003-O				
ETR Reference	SCH-007				
Tool	None.				
Test code	None.				
Preconditions	None.				
Test Procedure	In the server, configure to perform installation of a Schedule and subsequent activation.				
	• Set <x>/Validity with appropriate date and time (also see note).</x>				
	2. Establish the connection from the client.				
	3. Complete the DM session.				
	4. Check schedule is automatically stopped and removed by client.				
	Note: Other details of the Schedule should be negotiated between client and server vendor.				
Pass-Criteria	DM session runs through without any errors.				
	2. At the given date and time for Validity, client must stop the Schedule and remove it automatically.				

6.16 DMScheduling-1.0-int-016: Connection to Server

Test Case Id	DMScheduling-1.0-int-016		
Test Object	Client and Server device under test		
Test Case Description	Purpose of this test case is to show the compliance with respect to the Connect type Status Reporting.		
Specification Reference	5.2.4, 5.2.6		
SCR Reference	DMSched-OPR-C-004-O		
ETR Reference	OPR-007, OPR-008, OPR-003		
Tool	None.		
Test code	None.		
Preconditions	None.		

Test Procedure	 In the server, configure to perform installation of a Schedule and subsequent activation. 					
	• Set <x>/Task/Connect to "True" (also see note).</x>					
	2. Establish the connection from the client.					
	3. Complete the DM session.					
	4. Check how schedule runs.					
	Note: Other details of the Schedule should be negotiated between client and server vendor.					
Pass-Criteria	1. DM session runs through without any errors.					
	2. At the occurrence of triggers, client must initiate sessions with the Connect type Status Reporting message to server.					

6.17 DMScheduling-1.0-int-017: Activation/Deactivation Failure

Test Case Id	DMScheduling-1.0-int-017		
Test Object	Client and Server device under test		
Test Case Description	Purpose of this test case is to show compliance with the activation and deactivation of Schedule.		
Specification Reference	7.1		
SCR Reference	DMSched-BHV-C-001-M		
ETR Reference	BHV-001, BHV-004		
Tool	None.		
Test code	None.		
Preconditions	None.		

Test Procedure	1. In the server, configure to perform installation of a Schedule and subsequent activation (see note).			
	. Establish the connection from the client.			
	3. Complete the DM session.			
	Check the DM session goes without any errors.			
	5. Check the Schedule is running successfully.			
	6. Again, in the server, configure to perform activation of the same Schedule.			
	Establish the connection from the Client.			
	. Check the response from the Client.			
	9. Again, in the server, configure to perform deactivation of the same Schedule.			
	10. Establish the connection from the Client.			
	11. Check the response from the Client.			
	12. Again, in the server, configure to perform deactivation of the same Schedule.			
	13. Establish the connection from the Client.			
	14. Check the response from the Client.			
	te: Details for the Schedule (eg, nodes and their contents and URIs) ould be negotiated between client and server vendor.			
Pass-Criteria	1. The Client must return the status code 403 Forbidden (this needs to be done after step 8 and 14).			

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 < current version > History

Document Identifier	Date	Sections	Description
Draft Versions OMA-ETS-DM_Scheduling-V1_0	07 Oct 2008	6.5, 6.6, 6.7, 6.8, 6.9, 6.10, 6.11, 6.12, 6.13, 6.14, 6.15, 6.16	Additional Optional Test Cases are added.
	03 Sep 2008	All	Initial Baseline
	07 Oct 2008	5	CR incorporated:
			OMA-IOP-MEC-2008-0170
	04 Nov	3, 5, 6	CR incorporated:
			OMA-IOP-MEC-2008-0179R01
	10 Dec	6	Editorial correction for the wrong numbering of test steps.
	24 Feb	n/a	Update of template to 2009
Candidate Versions OMA-ETS-DM_Scheduling-V1_0	17 Mar 2009	n/a	TP approved doc# OMA-TP-2009-0100- INP_DM_Scheduling_1.0_ETS_for_Candidate_approval