



OMA DS Management Object

Approved Version 1.0 – 19 Jul 2011

Open Mobile Alliance
OMA-TS-DS_MO-V1_0-20110719-A

Use of this document is subject to all of the terms and conditions of the Use Agreement located at <http://www.openmobilealliance.org/UseAgreement.html>.

Unless this document is clearly designated as an approved specification, this document is a work in process, is not an approved Open Mobile Alliance™ specification, and is subject to revision or removal without notice.

You may use this document or any part of the document for internal or educational purposes only, provided you do not modify, edit or take out of context the information in this document in any manner. Information contained in this document may be used, at your sole risk, for any purposes. You may not use this document in any other manner without the prior written permission of the Open Mobile Alliance. The Open Mobile Alliance authorizes you to copy this document, provided that you retain all copyright and other proprietary notices contained in the original materials on any copies of the materials and that you comply strictly with these terms. This copyright permission does not constitute an endorsement of the products or services. The Open Mobile Alliance assumes no responsibility for errors or omissions in this document.

Each Open Mobile Alliance member has agreed to use reasonable endeavors to inform the Open Mobile Alliance in a timely manner of Essential IPR as it becomes aware that the Essential IPR is related to the prepared or published specification. However, the members do not have an obligation to conduct IPR searches. The declared Essential IPR is publicly available to members and non-members of the Open Mobile Alliance and may be found on the “OMA IPR Declarations” list at <http://www.openmobilealliance.org/ipr.html>. The Open Mobile Alliance has not conducted an independent IPR review of this document and the information contained herein, and makes no representations or warranties regarding third party IPR, including without limitation patents, copyrights or trade secret rights. This document may contain inventions for which you must obtain licenses from third parties before making, using or selling the inventions. Defined terms above are set forth in the schedule to the Open Mobile Alliance Application Form.

NO REPRESENTATIONS OR WARRANTIES (WHETHER EXPRESS OR IMPLIED) ARE MADE BY THE OPEN MOBILE ALLIANCE OR ANY OPEN MOBILE ALLIANCE MEMBER OR ITS AFFILIATES REGARDING ANY OF THE IPR'S REPRESENTED ON THE “OMA IPR DECLARATIONS” LIST, INCLUDING, BUT NOT LIMITED TO THE ACCURACY, COMPLETENESS, VALIDITY OR RELEVANCE OF THE INFORMATION OR WHETHER OR NOT SUCH RIGHTS ARE ESSENTIAL OR NON-ESSENTIAL.

THE OPEN MOBILE ALLIANCE IS NOT LIABLE FOR AND HEREBY DISCLAIMS ANY DIRECT, INDIRECT, PUNITIVE, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE USE OF DOCUMENTS AND THE INFORMATION CONTAINED IN THE DOCUMENTS.

© 2011 Open Mobile Alliance Ltd. All Rights Reserved.

Used with the permission of the Open Mobile Alliance Ltd. under the terms set forth above.

Contents

1.	SCOPE.....	5
2.	REFERENCES	6
2.1	NORMATIVE REFERENCES.....	6
2.2	INFORMATIVE REFERENCES.....	6
3.	TERMINOLOGY AND CONVENTIONS.....	7
3.1	CONVENTIONS.....	7
3.2	DEFINITIONS.....	7
3.3	ABBREVIATIONS.....	7
4.	INTRODUCTION	8
4.1	VERSION 1.0	8
5.	STANDARDIZED OMA DS MANAGEMENT OBJECT.....	9
5.1	MANAGEMENT OBJECT PARAMETERS.....	10
5.1.1	Node: <x>	10
5.1.2	Node: <x>/Version	10
5.1.3	Node: <y>	10
5.1.4	Node: <x>/<y>/ServerID.....	10
5.1.5	Node: <x>/<y>/PrefVersion	11
5.1.6	Node: <x>/<y>/Name.....	11
5.1.7	Node: <x>/<y>/PrefConRef.....	12
5.1.8	Node: <x>/<y>/ToConRef.....	12
5.1.9	Node: <x>/<y>/ToConRef/<x>	12
5.1.10	Node: <x>/<y>/ToConRef/<x>/ConRef.....	12
5.1.11	Node: <x>/<y>/AppAddr	12
5.1.12	Node: <x>/<y>/AppAddr/<x>	12
5.1.13	Node: <x>/<y>/AppAddr/<x>/Addr.....	13
5.1.14	Node: <x>/<y>/AppAddr/<x>/AddrType	13
5.1.15	Node: <x>/<y>/AppAddr/<x>/Port	13
5.1.16	Node: <x>/<y>/AppAddr/<x>/Port/<x>.....	13
5.1.17	Node: <x>/<y>/AppAddr/<x>/Port/<x>/PortNbr.....	13
5.1.18	Node: <x>/<y>/AuthInfo	13
5.1.19	Node: <x>/<y>/AuthInfo/<x>	14
5.1.20	Node: <x>/<y>/AuthInfo/<x>/AuthLevel	14
5.1.21	Node: <x>/<y>/AuthInfo/<x>/AuthType	14
5.1.22	Node: <x>/<y>/AuthInfo/<x>/AuthName.....	14
5.1.23	Node: <x>/<y>/AuthInfo/<x>/AuthSecret	14
5.1.24	Node: <x>/<y>/AuthInfo/<x>/AuthData	15
5.1.25	Node: <x>/<y>/Resource.....	15
5.1.26	Node: <x>/<y>/Resource/<x>	15
5.1.27	Node: <x>/<y>/Resource/<x>/Accept.....	15
5.1.28	Node: <x>/<y>/Resource/<x>/Name.....	15
5.1.29	Node: <x>/<y>/Resource/<x>/URI	15
5.1.30	Node: <x>/<y>/Resource/<x>/AuthType	15
5.1.31	Node: <x>/<y>/Resource/<x>/AuthName.....	16
5.1.32	Node: <x>/<y>/Resource/<x>/AuthSecret	16
5.1.33	Node: <x>/<y>/Resource/<x>/AuthData.....	16
5.1.34	Node: <x>/<y>/Resource/<x>/ClientURI.....	16
5.1.35	Node: <x>/<y>/Resource/<x>/SyncType.....	16
5.1.36	Node: <x>/<y>/Resource/<x>/<Filter N>	17
5.1.37	Node: <x>/<y>/Resource/<x>/<Filter N>/Default	17
5.1.38	Node: <x>/<y>/Resource/<x>/<Filter N>/Description	17
5.1.39	Node: <x>/<y>/Resource/<x>/<Filter N>/Content	17
5.1.40	Node: <x>/<y>/Resource/<x>/<Filter N>/Grammar.....	17

5.1.41 Node: <x>/<y>/Resource/<x>/<Filter N>/ExclusiveType 18

5.1.42 Node: <x>/<y>/Resource/<x>/<Filter N>/Use 18

5.1.43 Node: <x>/<y>/Sync 18

5.1.44 Node: <x>/<y>/Configure 18

5.1.45 Node: <x>/<y>/Configure/<x> 18

5.1.46 Node: <x>/<y>/Configure/<x>/Datastore 18

5.1.47 Node: <x>/<y>/Configure/<x>/SyncType 18

5.1.48 Node: <x>/<y>/Ext 19

APPENDIX A. STATIC CONFORMANCE REQUIREMENTS (NORMATIVE) 20

A.1 SCR FOR DSMO TREE STRUCTURE 20

APPENDIX B. SCHEDULED SYNC (INFORMATIVE) 21

APPENDIX C. CHANGE HISTORY (INFORMATIVE) 22

C.1 APPROVED VERSION 1.0 HISTORY 22

Figures

Figure 1: OMA DS Management Object tree 9

Figure 2: Scheduled Sync Flow 21

Tables

Table 1: AuthLevel Values 14

1. Scope

This document defines the DS Management Object, which offers a standardized way to represent data sync settings within a device's OMA Device Management tree.

The DS Management Object is defined using the OMA DM Device Description Framework (DDF) and the DS Management Object has standardized points of extension to permit implementation-specific parameters to accompany the standardized parameters. This added flexibility is intended to encourage the use of the standardized object while not unnecessarily restricting individual vendor innovations.

2. References

2.1 Normative References

- [AUTH-RFC791] *RFC 791, Internet Protocol, DARPA, 1981,*
[URL:http://www.ietf.org/rfc/rfc791.txt](http://www.ietf.org/rfc/rfc791.txt)
- [ConnMO] “Connectivity Management Object”, Version 1.0, Open Mobile Alliance™, OMA-DM-ConnMO-V1_0,
[URL:http://www.openmobilealliance.org](http://www.openmobilealliance.org)
- [DMBOOT] “OMA Device Management Bootstrap, Version 1.2”. Open Mobile Alliance™. OMA-TS-DM_Bootstrap-V1_2.
[URL:http://www.openmobilealliance.org](http://www.openmobilealliance.org)
- [DMStdObj] “OMA Device Management Standardized Objects”, Version 1.2, Open Mobile Alliance™
OMA-TS-DM-DMStdObj-V1_2,
[URL:http://www.openmobilealliance.org](http://www.openmobilealliance.org)
- [DMTND] “OMA Device Management Tree and Description”, Version 1.2, Open Mobile Alliance™
OMA-TS-DM-DMTND-V1_2,
[URL:http://www.openmobilealliance.org](http://www.openmobilealliance.org)
- [DMTNS] “OMA Device Management Tree and Description Serialization Specification, Version 1.2”. Open Mobile Alliance. OMA-TS-DM_TNDS-V1_2.
[URL:http://www.openmobilealliance.org](http://www.openmobilealliance.org)
- [DSSyntax] “OMA DS Syntax”, Version 2.0, Open Mobile Alliance™, OMA-TS-DS_Syntax-V2_0,
[URL:http://www.openmobilealliance.org/](http://www.openmobilealliance.org)
- [IOPPROC] “OMA Interoperability Policy and Process”, Version 1.1, Open Mobile Alliance™, OMA-IOP-Process-V1_1,
[URL:http://www.openmobilealliance.org/](http://www.openmobilealliance.org/)
- [OMADM] “OMA Device Management Enabler”, Version 1.2, Open Mobile Alliance™
OMA-ERELED-DM-V1_2,
[URL:http://www.openmobilealliance.org](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](http://www.ietf.org/rfc/rfc2119.txt)

2.2 Informative References

3. Terminology and Conventions

3.1 Conventions

The key words “SHALL”, “SHALL 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” and “Introduction”, are normative, unless they are explicitly indicated to be informative.

3.2 Definitions

Data Sync Client	An entity refers to the protocol role when the application issues SyncML request messages. For example in data synchronization, the ‘Sync’ SyncML Command in a SyncML Message.
Data Sync Server	An entity refers to the protocol role when an application issues SyncML response messages. For example in the case of data synchronization, a ‘Results’ Command in a SyncML Message.
Device	Equipment which is normally used by users for communications and related activities.
User	An entity which uses services. Example: a person using a data synchronization service.

3.3 Abbreviations

DM	Device Management
DS	Data Synchronization
DTD	Document Type Definition
HTTP	HyperText Transfer Protocol
MO	Management Object
NAP	Network Access Point
OBEX	Object Exchange Protocol
URI	Uniform Resource Identifier
WSP	Wireless Session Protocol
XML	Extensible Mark-up Language

4. Introduction

To avoid the situation where each device vendor defines a specialized and non-standard arrangement for managing Data Sync settings, this specification defines the DS Management Object to permit the standardized representation and management of DS settings on devices.

4.1 Version 1.0

The DS MO version 1.0 aims to provide the configuration parameters for the DS Client.

The DS MO version 1.0 can be used for both DS 1.2.x enabler and DS 2.0 enabler.

5. Standardized OMA DS Management Object

The OMA DS management object is used to represent and manage OMA DS settings for the DS client on a managed device. Please refer to [DMStdObj] for the definition and description of "management object".

If DS MO is provisioned together with other management object(s) during bootstrap then [DMTNDs] and [DMBOOT] MUST be used.

The DS Management Object is compatible with OMA DM [OMADM] protocol version 1.2 or any later compatible version.

Management Object Identifier for the DS Management Object SHALL be: "urn:oma:mo:oma-dsmo:1.0".

The following figure provides the structure of the DS management object.

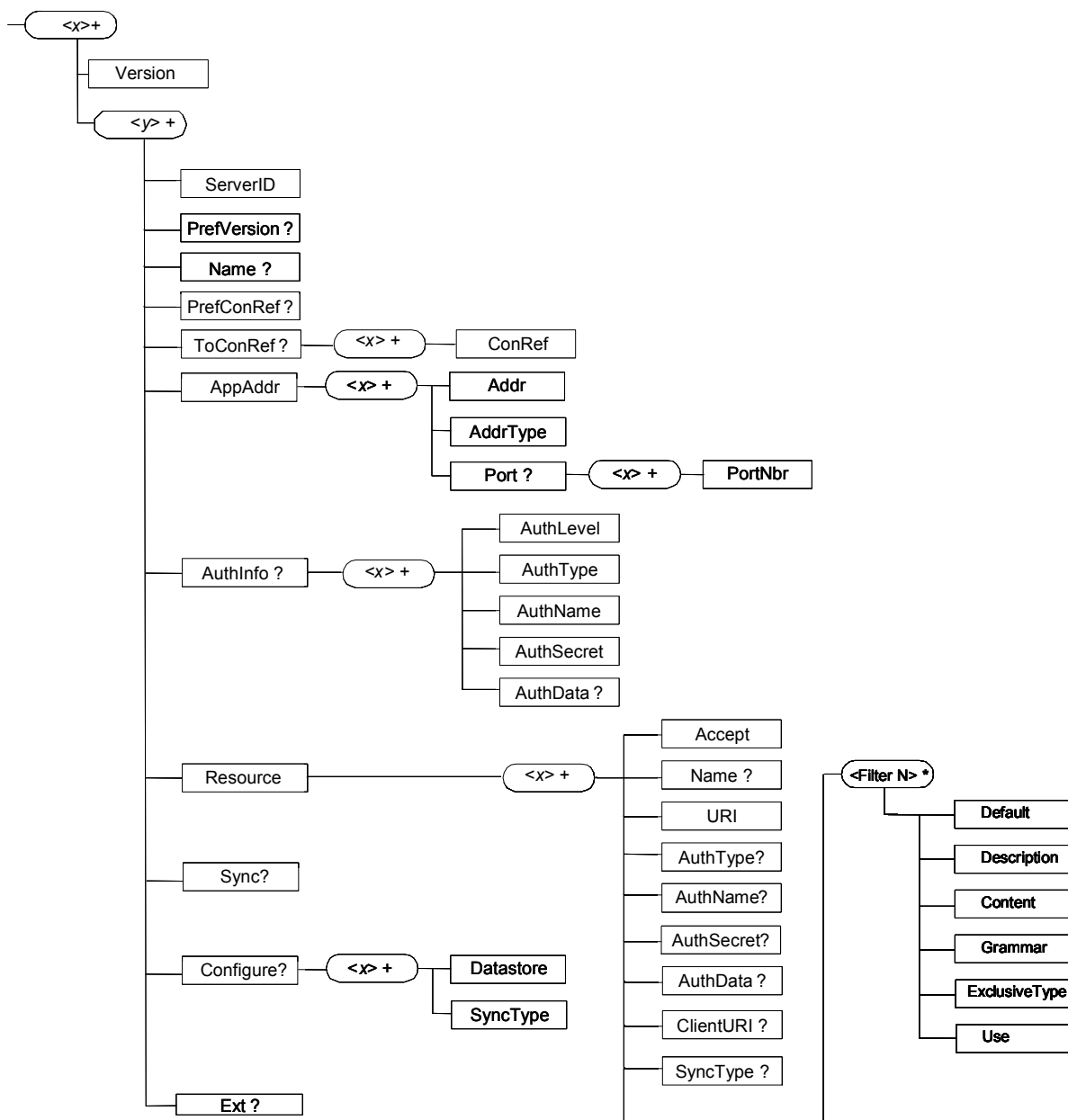


Figure 1: OMA DS Management Object tree

5.1 Management Object Parameters

This section describes the parameters for the OMA DS Management Object.

5.1.1 Node: <x>

Status	Occurrence	Format	Access
REQUIRED	OneOrMore	Node	Get

This interior node acts as a placeholder for one or more accounts or for a fixed node. Each instance of this node refers to a different DS Client in the device. Devices MUST build the Name property of this node according to the following structure: *common prefix* + *instance number* + *client manufacturer*. The *common prefix* value MUST be "SyncAgent" while *instance number* is a string starting from "1". *Client manufacturer* is an implementation dependant string.

As an example, a device implementing this specification with the above recommendations, will instantiate two DS Clients using a common prefix set to "SyncAgent" in the following way:

Client 1, Name property value for <x> = "SyncAgent1Huawei"

Client 2, Name property value for <x> = "SyncAgent2Funambol".

5.1.2 Node: <x>/Version

Status	Occurrence	Format	Access
REQUIRED	One	Chr	Get

This leaf node specifies the version of the DS Management Object.

5.1.3 Node: <y>

Status	Occurrence	Format	Access
REQUIRED	OneOrMore	Node	Get

This interior node acts as a placeholder for one or more accounts. Each account MUST depict one single Data Sync Server. The device MUST ensure that one instance of <y> can only exist under one single <x>. In other words, each instance of <y> refers to a different and unique DS Server (see §5.1.4 further reference).

Devices MUST build the Name property of this node according to the following structure: *common prefix* + *instance number*. The *common prefix* value MUST be "SyncServer" while *instance number* is a string starting from "1".

As an example, a device implementing this specification with the above recommendations, will instantiate two <y> nodes using a common prefix set to "SyncServer" in the following way:

Server 1, Name property value for <y> = "SyncServer1"

Server 2, Name property value for <y> = "SyncServer2".

5.1.4 Node: <x>/<y>/ServerID

Status	Occurrence	Format	Access
REQUIRED	One	Chr	Get

This leaf node specifies the server identifier for the Data Sync Server being used.

5.1.5 Node: <x>/<y>/PrefVersion

Status	Occurrence	Format	Access
REQUIRED	ZeroOrOne	Chr	Get / Replace

This leaf node specifies either the DS protocol version which SHOULD be used between the DS Client and the DS Server (E.g. Client initiated sync or Server initiated sync) or a list of supported versions ordered by priority (regardless of the support for multiple simultaneous sync sessions). In the case of a list of supported versions ordered by priority, PrefVersion MUST include protocol versions separated by commas (“,”) with no spaces (“ ”) between them (e.g. “2.0,1.2” means 2.0 has higher priority than 1.2).

Interpretation of this leaf node depends on the occurrence, the number of protocols supported by the DS Client and the actual value of the character string as indicated in the following table:

Occurrence	Multi-protocol Client	PrefVersion value	Interpretation
Zero	No		See Detail (1)
	Yes		See Details (3) and (4)
One	No	Null	See Detail (1)
	Yes		See Details (3) and (4)
	No	1.2	See Detail (1)
	Yes		See Detail (2)
	No	2.0	See Detail (1)
	Yes		See Detail (2)

Detail (1): Single-protocol clients that receive notifications for protocol versions they do not support MUST send back a Status Code 513 (Protocol Version Not Supported) indicating in the `Item` element type the protocol version they actually support.

Detail (2): The initiator SHOULD use the preferred protocol.

Detail (3): When a multi-protocol server tries to synchronize with a client in which the PrefVersion is set to NULL or is not initialized and it has no preferred version information from an out-of-band mechanism, the server SHOULD try the highest protocol version it is capable of supporting and then the others in descending order.

Detail (4): When a multi-protocol client tries to synchronize with a server and its PrefVersion is set to NULL or is not initialized and it has no preferred version information from an out-of-band mechanism, the client SHOULD try the highest protocol version it is capable of supporting and then the others in descending order.

5.1.6 Node: <x>/<y>/Name

Status	Occurrence	Format	Access
OPTIONAL	ZeroOrOne	Chr	Get

This optional leaf node specifies user displayable name for the Data Sync Server.

5.1.7 Node: <x>/<y>/PrefConRef

Status	Occurrence	Format	Access
OPTIONAL	ZeroOrOne	Chr	Get

This optional leaf node specifies a reference to preferred connectivity. It is expected that either a PROXY or NAP MO is specified, but other, implementation-specific connections may be referenced. The PROXY and NAP MO are described in [ConnMO]. The values of this node could be URI to a management object or implementation specific identifier.

Example: ./AP/ThisOperator/NAPDef/1/ThisItem

5.1.8 Node: <x>/<y>/ToConRef

Status	Occurrence	Format	Access
OPTIONAL	ZeroOrOne	Node	Get

This optional interior node is used to allow application to refer to a collection of connectivity definitions. Several connections may be listed for a given application under this interior node.

5.1.9 Node: <x>/<y>/ToConRef/<x>

Status	Occurrence	Format	Access
REQUIRED	OneOrMore	Node	Get

This interior node acts as a placeholder for one or more linkage to connectivity parameters.

5.1.10 Node: <x>/<y>/ToConRef/<x>/ConRef

Status	Occurrence	Format	Access
REQUIRED	One	Chr	Get

This leaf node indicates the linkage to connectivity parameters.

Example: ./AP/ThisOperator/NAPDef/1/ThisItem

5.1.11 Node: <x>/<y>/AppAddr

Status	Occurrence	Format	Access
REQUIRED	One	Node	Get

This node is used to specify (multiple) DS Server address(es).

5.1.12 Node: <x>/<y>/AppAddr/<x>

Status	Occurrence	Format	Access
REQUIRED	OneOrMore	Node	Get

This interior node acts as a placeholder for separating one or more DS Server addresses.

5.1.13 Node: <x>/<y>/AppAddr/<x>/Addr

Status	Occurrence	Format	Access
REQUIRED	One	Chr	Get

This interior node is used to specify the Data Sync Server addresses, which may differ based on the used transport binding.

5.1.14 Node: <x>/<y>/AppAddr/<x>/AddrType

Status	Occurrence	Format	Access
REQUIRED	One	Chr	Get

This leaf node specifies the Data Sync Server address type.

Authorities of reference and allowed values for **AddrType** are bearer-specific and are not listed here. Implementers are referred to the bearer specifications and the listed normative references describing each protocol for the proper usage context and details of each address type.

If the bearer type-specific parameter specification does not define a value for this node then the default value “IPv4” MUST be assumed and the **Addr** node MUST represent an IPv4 address [AUTH-RFC791] represented in string form dotted-decimal CIDR (Classless InterDomain Routing) notation.

5.1.15 Node: <x>/<y>/AppAddr/<x>/Port

Status	Occurrence	Format	Access
OPTIONAL	ZeroOrOne	Node	Get

This node specifies Port information for DS Server address.

5.1.16 Node: <x>/<y>/AppAddr/<x>/Port/<x>

Status	Occurrence	Format	Access
REQUIRED	OneOrMore	Node	Get

This interior node acts as a placeholder for separating one or more Port settings.

5.1.17 Node: <x>/<y>/AppAddr/<x>/Port/<x>/PortNbr

Status	Occurrence	Format	Access
REQUIRED	One	Chr	Get

This leaf node specifies the number of a single port as a 16bit unsigned integer.

5.1.18 Node: <x>/<y>/AuthInfo

Status	Occurrence	Format	Access
OPTIONAL	ZeroOrOne	Node	Get

This interior node specifies authentication information.

5.1.19 Node: <x>/<y>/AuthInfo/<x>

Status	Occurrence	Format	Access
REQUIRED	OneOrMore	Node	Get

This interior node acts as a placeholder for separating one or more authentication settings.

5.1.20 Node: <x>/<y>/AuthInfo/<x>/AuthLevel

Status	Occurrence	Format	Access
REQUIRED	One	Chr	Get

This leaf node specifies the authentication level. The used values are described below.

Transport	Status	Description
CLCRED	Optional	Credentials which used by the Data Sync Client to authenticate itself to the Data Sync Server at the DS protocol level.
SRVCRED	Optional	Credentials which used by the Data Sync Server to authenticate itself to the Data Sync Client at the DS protocol level.
OBEX	Optional	Credentials for OBEX authentication. NOTE: If this AuthLevel is selected only HTTP-BASIC, HTTP-DIGEST and TRANSPORT are possible authentication schemes.
HTTP	Optional	Credentials for HTTP (/WSP) authentication. NOTE: If this AuthLevel is selected, the possible authentication schemes are HTTP-BASIC, HTTP-DIGEST and TRANSPORT. Other values are not excluded.

Table 1: AuthLevel Values

5.1.21 Node: <x>/<y>/AuthInfo/<x>/AuthType

Status	Occurrence	Format	Access
REQUIRED	One	Chr	Get

This leaf node specifies the authentication scheme. The values could be "HTTP-BASIC", "HTTP-DIGEST", "BASIC", "MD5", "SHA-1", "SHA-256", "X509", "SECUREID", "SAFWORD". Other values are not excluded.

5.1.22 Node: <x>/<y>/AuthInfo/<x>/AuthName

Status	Occurrence	Format	Access
REQUIRED	One	Chr	Get

This optional leaf node specifies the user name for authentication. For the DS Client, the value of this node is the user identifier. For the DS Server, the value of this node is the server identifier.

5.1.23 Node: <x>/<y>/AuthInfo/<x>/AuthSecret

Status	Occurrence	Format	Access
REQUIRED	One	Chr	No Get

This leaf node specifies the authentication secret/password shared between the Data Sync Client and Data Sync Server.

5.1.24 Node: <x>/<y>/AuthInfo/<x>/AuthData

Status	Occurrence	Format	Access
OPTIONAL	ZeroOrOne	Chr	No Get

This node specifies the authentication data relating to the AuthType.

5.1.25 Node: <x>/<y>/Resource

Status	Occurrence	Format	Access
REQUIRED	One	Node	Get

This interior node specifies the list of databases.

5.1.26 Node: <x>/<y>/Resource/<x>

Status	Occurrence	Format	Access
REQUIRED	OneOrMore	Node	Get

This interior node acts as a placeholder for separating one or more databases settings.

5.1.27 Node: <x>/<y>/Resource/<x>/Accept

Status	Occurrence	Format	Access
REQUIRED	One	Chr	Get

This leaf node specifies MIME content types the database supports (in string form).

5.1.28 Node: <x>/<y>/Resource/<x>/Name

Status	Occurrence	Format	Access
OPTIONAL	ZeroOrOne	Chr	Get

This optional leaf node specifies the user displayable name for database.

5.1.29 Node: <x>/<y>/Resource/<x>/URI

Status	Occurrence	Format	Access
REQUIRED	One	Chr	Get

This leaf node specifies the server database URI.

5.1.30 Node: <x>/<y>/Resource/<x>/AuthType

Status	Occurrence	Format	Access
OPTIONAL	ZeroOrOne	Chr	Get

This leaf node specifies the Database level authentication scheme. The values could be "HTTP-BASIC", "HTTP-DIGEST", "BASIC", "MD5", "SHA-1", "SHA-256", "X509", "SECUREID", "SAFWORD". Other values are not excluded.

5.1.31 Node: <x>/<y>/Resource/<x>/AuthName

Status	Occurrence	Format	Access
OPTIONAL	ZeroOrOne	Chr	Get

This leaf node specifies the user name of Database level authentication.

5.1.32 Node: <x>/<y>/Resource/<x>/AuthSecret

Status	Occurrence	Format	Access
OPTIONAL	ZeroOrOne	Chr	No Get

This leaf node specifies the secret/password of database level authentication secret.

5.1.33 Node: <x>/<y>/Resource/<x>/AuthData

Status	Occurrence	Format	Access
OPTIONAL	ZeroOrOne	Chr	No Get

This node specifies the authentication data relating to the AuthType.

5.1.34 Node: <x>/<y>/Resource/<x>/ClientURI

Status	Occurrence	Format	Access
OPTIONAL	ZeroOrOne	Chr	Get

This optional leaf node specifies the client database URI.

5.1.35 Node: <x>/<y>/Resource/<x>/SyncType

Status	Occurrence	Format	Access
OPTIONAL	ZeroOrOne	Int	Get

This optional leaf node specifies the sync type of synchronization to perform on the database.

For DS 1.2.x, the value of this node is the numeric value computed using the corresponding alert code 200-205 minus 200.

For DS 2.0, the value of this node indicates the 'Direction' and 'Behaviour' sync type parameters.

The table below shows the possible values and the interpretations for DS 1.2.x and DS 2.0.

Value	Interpretation in DS 1.2.x	Interpretation in DS 2.0
0	Two way	Direction: twoWay, Behaviour: Preserve
1	Slow sync	Direction: twoWay, Behaviour: Preserve Recovery Sync (include FP)
2	One way from client	Direction: fromClient, Behaviour: Preserve
3	Refresh from client	Direction: fromClient, Behaviour: Refresh
4	One way from server	Direction: fromServer, Behaviour: Preserve

5	Refresh from server	Direction: fromServer, Behaviour: Refresh
6	N/A	Direction: NoWay, Behaviour: Preserve

5.1.36 Node: <x>/<y>/Resource/<x>/<Filter N>

Status	Occurrence	Format	Access
OPTIONAL	ZeroOrMore	Node	Get

This interior node specifies one of the pre-defined filters. Devices MUST build the Name property of this node according to the following structure: common prefix + instance number. The *common prefix* value MUST be "Filter" while *instance number* is a string starting from "1". As an example, a device implementing this specification with the above recommendations, will instantiate two filters in the following way:

Filter 1, Name property value for <Filter N> = "Filter1"
 Filter 2, Name property value for <Filter N> = "Filter2".

5.1.37 Node: <x>/<y>/Resource/<x>/<Filter N>/Default

Status	Occurrence	Format	Access
REQUIRED	One	Bool	Get

Only one Field, and one Record filter may be active by default per Resource node. So, using this leaf node, the management authority can indicate which filter, among several pre-defined filters, is the default filter. Without any user intervention, this filter will be used by default by the DS client software. The possible values are "true" (default filter) or "false" (non default filter).

5.1.38 Node: <x>/<y>/Resource/<x>/<Filter N>/Description

Status	Occurrence	Format	Access
REQUIRED	One	Chr	Get

This leaf node specifies a literal description of the filter: it is for example what will be displayed on the user's screen to describe the corresponding filtering.

5.1.39 Node: <x>/<y>/Resource/<x>/<Filter N>/Content

Status	Occurrence	Format	Access
REQUIRED	One	Chr	Get

This leaf node specifies the filter itself. Its content structure depends on Grammar (see below). This content describes a legal filter i.e. understandable by the DS server, so this content MUST be written according to the fields definitions known by the DS server.

5.1.40 Node: <x>/<y>/Resource/<x>/<Filter N>/Grammar

Status	Occurrence	Format	Access
REQUIRED	One	Chr	Get

This leaf node is used to describe the MIME type of the Content field. It specifies the grammar used in the Content and its value is similar to the one used in the Type of the filter Element (e.g. syncml:filtertype-cgi).

5.1.41 Node: <x>/<y>/Resource/<x>/<Filter N>/ExclusiveType

Status	Occurrence	Format	Access
REQUIRED	One	Bool	Get

This leaf node is used to distinguish between Exclusive and Inclusive filters. The possible values are “true” for an EXCLUSIVE filter, or “false” for an INCLUSIVE filter.

5.1.42 Node: <x>/<y>/Resource/<x>/<Filter N>/Use

Status	Occurrence	Format	Access
REQUIRED	One	Bool	Get

This leaf node indicates if the filter is a Field level (“true”) or a Record level (“false”) filter.

5.1.43 Node: <x>/<y>/Sync

Status	Occurrence	Format	Access
OPTIONAL	ZeroOrOne	Null	Get, Exec

This node is used with Exec command to invoke a scheduled sync. After receiving the Exec command, the DS Client will initiate a session with the DS Server using the configuration parameters as indicated in Configure sub-tree.

Please refer to Appendix B for more information about the scheduled sync.

5.1.44 Node: <x>/<y>/Configure

Status	Occurrence	Format	Access
OPTIONAL	ZeroOrOne	Node	Get

This interior node groups together the configuration parameters for the scheduled sync.

5.1.45 Node: <x>/<y>/Configure/<x>

Status	Occurrence	Format	Access
REQUIRED	OneOrMore	Node	Get

This interior node acts as a placeholder node for a specific group of configuration parameters for the scheduled sync. After successful scheduled sync, the configurations of the Datastore and SyncType should be removed to avoid duplicate execution.

5.1.46 Node: <x>/<y>/Configure/<x>/Datastore

Status	Occurren	Format	Access
REQUIRED	One	Chr	Get

This leaf node is used to specify the URI of the server datastore which the server wants the client to sync with.

5.1.47 Node: <x>/<y>/Configure/<x>/SyncType

Status	Occurren	Format	Access
REQUIRED	One	Int	Get

This leaf node is used to specify the sync type of synchronization to perform on the datastore.

For DS 1.2.x, the value of this node is the numeric value computed using the corresponding alert code 200-205 minus 200. For example, for a server to indicate a ‘two-way sync’ (alert code is 200) the SyncType node would contain the value 0.

When the client starts a synchronization session in case of schedule sync, then in its initialization package sent to the server it must use the value of alert code used at the synchronization initialization and MUST NOT use the value of SyncType node. For example, if the value of SyncType is 0 (‘two-way sync’), then the initialization package would contain the alert code for the ‘two-way sync’ (value 200).

The client may initiate a synchronization session with an alert code which does not correspond to SyncType value. For example, if the value of SyncType is ‘two-way sync’ (value 0) then the initialization package may contain the alert code for ‘one-way from client’ (value 202).

For DS 2.0, the value of this node indicates the 'Direction' and 'Behaviour' sync type parameters recommended to the DS Client.

The table below shows the possible values and the interpretations for DS 1.2.x and DS 2.0.

Value	Interpretation in DS 1.2.x	Interpretation in DS 2.0
0	Two way	Direction: twoWay, Behaviour: Preserve
1	Slow sync	Direction: twoWay, Behaviour: Preserve Recovery Sync (include FP)
2	One way from client	Direction: fromClient, Behaviour: Preserve
3	Refresh from client	Direction: fromClient, Behaviour: Refresh
4	One way from server	Direction: fromServer, Behaviour: Preserve
5	Refresh from server	Direction: fromServer, Behaviour: Refresh
6	N/A	Direction: NoWay, Behaviour: Preserve

5.1.48 Node: <x>/<y>/Ext

Status	Occurrence	Format	Access
OPTIONAL	ZeroOrOne	Node	Get

The Ext node is an optional interior node where the vendor specific information about this particular application is being placed (vendor meaning application vendor, device vendor, OS vendor etc.). Usually the vendor extension is identified by vendor specific name under the ext node. The tree structure under the vendor identified is not defined and can therefore include non-standardized sub-tree. However, vendor extensions SHALL NOT be defined outside of one of these Ext sub-trees.

Appendix A. Static Conformance Requirements (Normative)

The notation used in this appendix is specified in [IOPPROC].

A.1 SCR for DSMO Tree Structure

Item	Function	Reference	Status	Requirement
DSMO-T-001	Support for indicating the correct MO Identifier for the DS MO	Section 5	M	
DSMO-T-002	Support for OMA DM 1.2 or later compatibility version	Section 5	M	
DSMO-T-003	Support for all mandatory nodes in DS MO	Section 5.1	M	
DSMO-T-004	Support for the <x>/<y>/Name node	Section 5.1.6	O	
DSMO-T-005	Support for the <x>/<y>/PrefConRef node	Section 5.1.7	O	
DSMO-T-006	Support for the <x>/<y>/ToConRef node	Section 5.1.8	O	DSMO-T-007
DSMO-T-007	Support for the <x>/<y>/ToConRef/<x>/ConRef node	Section 5.1.10	O	
DSMO-T-008	Support for the <x>/<y>/AppAddr/<x>/Port/<x>/PortNbr node	Section 5.1.17	O	
DSMO-T-009	Support for the <x>/<y>/Resource/<x>/Name node	Section 5.1.28	O	
DSMO-T-010	Support for the <x>/<y>/Resource/<x>/ClientURI node	Section 5.1.34	O	
DSMO-T-011	Support for the <x>/<y>/Resource/<x>/SyncType node	Section 5.1.35	O	
DSMO-T-012	<x>/<y>/Resource/<x>/AuthData node	Section 5.1.33	O	
DSMO-T-013	<x>/<y>/AuthInfo/<x>/AuthData node	Section 5.1.24	O	
DSMO-T-014	<x>/<y>/Resource/<x>/<Filter N> node	Section 5.1.36	O	
DSMO-T-015	<x>/<y>/Sync	Section 5.1.43	O	
DSMO-T-016	<x>/<y>/Configure	Section 5.1.44	O	
DSMO-T-017	Support for the <x>/<y>/Ext node	Section 5.1.48	O	

Appendix B. Scheduled Sync

(Informative)

The following flow indicates how to use DS MO together with DM Scheduling 1.0 enabler and DM 1.2 enabler to achieve scheduled sync.

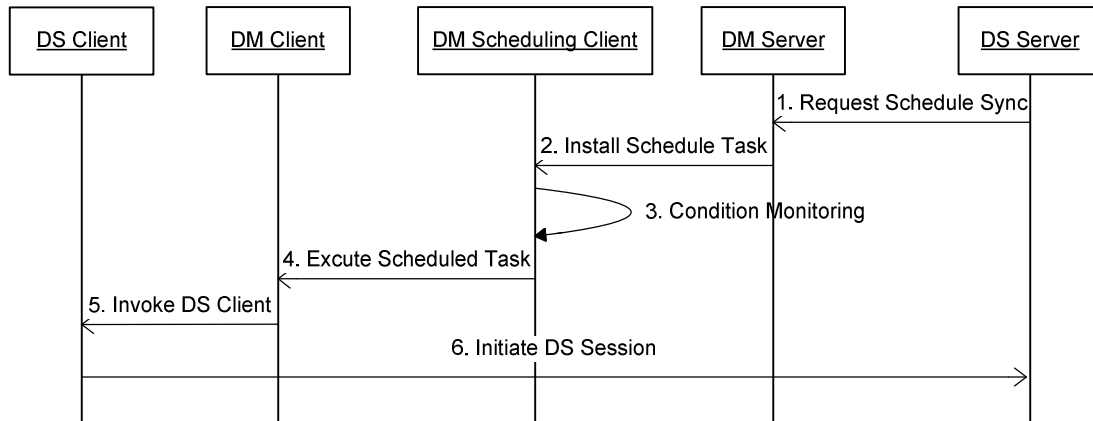


Figure 2: Scheduled Sync Flow

The detailed description for the flow is described as the following:

1. DS Server requests DM Server to create a schedule task for scheduled sync.
2. DM Server creates the schedule task and installs the schedule task to the DM Scheduling task. That is, DM Server configures the DM Scheduling MO using DM commands.
3. DM Scheduling Client monitors the conditions, especially, time condition.
4. When the conditions are satisfied, the DM Scheduling Client will invoke DM Client to execute the scheduled task. For example, the scheduled task can be:

```
<Exec>
```

```
... ..
```

```
<Target>
```

```
<LocURI> ./DSMO/SyncAgent1Huawei/SyncServer1/Sync</LocURI>
```

```
</Target>
```

```
</Exec>
```

5. When executing the schedule task, DM Client invokes the DS Client to start a sync with the configured parameters.
6. DS Client initiates a session with DS Server to start sync with the specified datastore and the specified sync types.

Note that step 1 to step 5 in the flow are out of scope of DS enabler. DS MO is just used for configuration purpose.

Appendix C. Change History

(Informative)

C.1 Approved Version 1.0 History

Reference	Date	Description
OMA-TS-DS_MO-V1_0-20110719-A	19 Jul 2011	Status changed to Approved by TP: OMA-TP-2011-0258-INP_DS_V2_0_ERP_for_final_Approval