Enabler Release Definition for Data Synchronization

Candidate Version 1.2 – 16 Mar 2006

Open Mobile Alliance

OMA-ERELD-DS-V1_2-20060316-C

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1. Scope

The SyncML Initiative, Ltd. was a not-for-profit corporation formed by a group of companies who co-operated to produce an open specification for data synchronization and device management. Prior to SyncML, data synchronization and device management had been based on a set of different, proprietary protocols, each functioning only with a very limited number of devices, systems and data types. These non-interoperable technologies have complicated the tasks of users, manufacturers, service providers, and developers. Further, a proliferation of different, proprietary data synchronization and device management protocols has placed barriers to the extended use of mobile devices, has restricted data access and delivery and limited the mobility of the users.

The SyncML Initiative merged with the Open Mobile Alliance in November 2002. The SyncML legacy specifications were converted to the OMA format with the 1.1.2 versions of OMA SyncML Common, OMA Data Synchronization and OMA Device Management in May 2002. The relationship between these documents which had been created during the SyncML Initiative has been preserved and is depicted in Figure 1 OMA SyncML Specification Structure and Relationships.

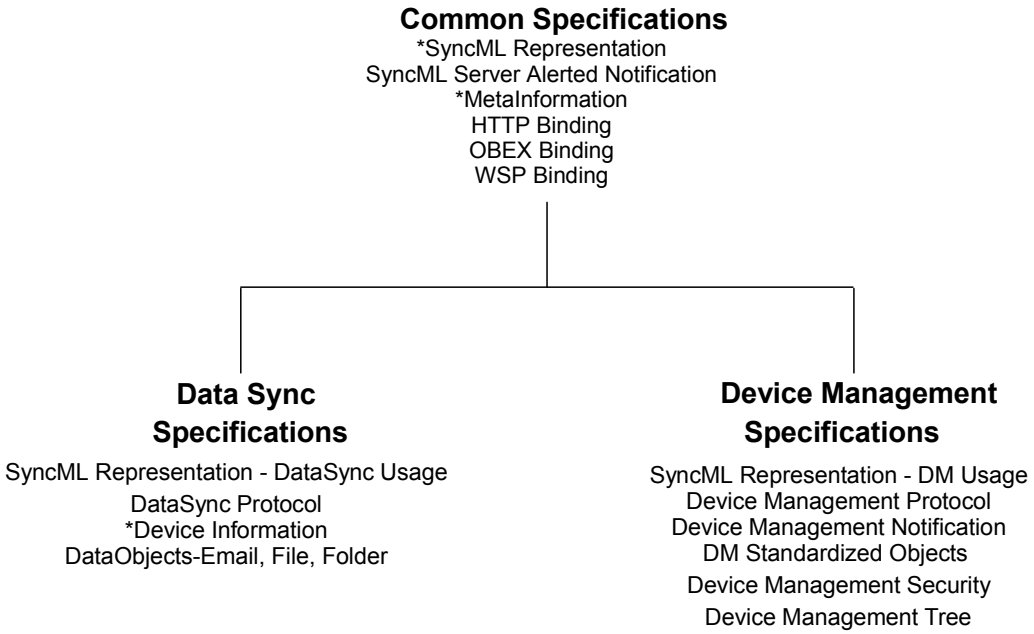

Figure 1 OMA SyncML Specification Structure and Relationships

The OMA SyncML Common Specifications Enabler Release includes the following documents:

- SyncML Representation: The XML-based representation protocol which specifies the common XML syntax and semantics used by all SyncML protocols. This defines the superset of the DS and DM representation protocols. (* includes DTD).
- The transport bindings: HTTP, OBEX, WSP. These specify the features of each transport required by DS and DM protocol messages.
- The Meta Information associated with a SyncML command or data item or collection used by either DS or DM (* includes DTD)
- SyncML Server Alerted Notification: The logical structure and format of the notification messages used by all SyncML server alerted notifications, for both DS and DM.

The OMA Data Synchronization Specifications Enabler Release includes the following documents:

- SyncML Representation DataSync Usage: The subset of the Common Specifications SyncML Representation Specification necessary to define the Data Synchronization commands and protocol, with examples and commentary specific to DS.
- DataSyncProtocol: Specifies how SyncML Common messages conforming to the DTD are exchanged in order to allow an OMA DS client and server to exchange additions, deletions, updates and other status information.
- Device Information: Used to exchange device specific information, including hardware, firmware, software levels, available memory, and local databases supported. (* Includes DTD)
- Data Objects: Email, File, Folder: Each object is identified by a unique MIME media type (eg. **application/vnd.omads-email)**. The objects are either represented by or encapsulated in a mark-up language defined by xml. Meta or state data is included in the representation (eg. Read/Unread, Creation Date, Last Modified Date).

Although the SyncML Common specification defines transport bindings that specify how to use a particular transport to exchange messages and responses, the SyncML Common representation, synchronization and device management protocols are transport-independent. Each package in these protocols is completely self-contained, and could in principle be carried by any transport. The initial bindings specified are HTTP, WSP and OBEX, but there is no reason why SyncML Common could not be implemented using email or message queues, to list only two alternatives. Because the SyncML Common messages are self-contained, multiple transports may be used without either the server or client devices having to be aware of the network topology. Thus, a short-range OBEX connection could be used for local connectivity, with the messages being passed on via HTTP to an Internet-hosted synchronization server.

To reduce the data size, a binary coding of SyncML Common based on the WAP Forum's WBXML is defined. Messages may also be passed in clear text if required. In this and other ways SyncML Common addresses the bandwidth and resource limitations imposed by mobile devices.

SyncML Common is both data type and data store independent. SyncML Common can carry any data type which can be represented as a MIME object. To promote interoperability between different implementations of OMA Data Synchronization, the specification includes the representation formats used for common PIM data.

The OMA SyncML Data Synchronization v1.2 Enabler Release continues the effort to promote a single, common data synchronization protocol.

2. References

2.1 Normative References

[DSREPU] "SyncML Representation Protocol, Data Synchronization Usage", Open Mobile Alliance™, OMA-TS-DS_DataSyncRep-V1_2, URL:http:www.openmobilealliance.org

[ELREDSC] "Enabler Release Definition for SyncML Common Specifications", Open Mobile Alliance™, OMA-ERELD-SyncML-Common-V1_2, URL:http:www.openmobilealliance.org

[EMAILOBJ] "Email Data Object Specification", Open Mobile Alliance™, OMA-TS-DS-DataObjEmail-V1_2, URL:http:www.openmobilealliance.org

[FILEOBJ] "File Data Object Specification", Open Mobile Alliance™, OMA-TS-DS-DataObjFile-V1_2, URL:http:www.openmobilealliance.org

[FOLDEROBJ] "Folder Data Object Specification", Open Mobile Alliance™, OMA-TS-DS-DataObjFolder-V1_2, URL:http:www.openmobilealliance.org

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

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

[DSPRO] "DS Protocol", Open Mobile Alliance™, OMA-TS-DS_Protocol-V1_2, URL:http:www.openmobilealliance.org

[DSDEV] "OMA DS Device Information", Open Mobile Alliance™, OMA-TS-DS-DevInf-V1_2, URL:http:www.openmobilealliance.org

[DSDEVDTD] "OMA DS Device Information Document Type Definition", Open Mobile Alliance™, OMA-TS-DS-DevInf-DTD-V1_2, URL:http:www.openmobilealliance.org

[W5APPCHAR] "W5 Application Characteristics", Open Mobile Alliance™, OMA-TS-DS-W5AppChar-V1_2, URL:http:www.openmobilealliance.org

2.2 Informative References

[CHANGEHIST] "OMA DS Standards Change History", Open Mobile Alliance™, OMA-WP-SyncML_ChangeHistory, 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” and “Introduction”, are normative, unless they are explicitly indicated to be informative.

The formal notation convention used in sections 9 and 10 to formally express the structure and internal dependencies between specifications in the Enabler Release specification baseline is detailed in [IOPPROC].

3.2 Definitions

Data synchronization	The act of establishing an equivalence between two data collections, where each data element in one item maps to a data item in the other, and their data is equivalent.
Enabler Release	A collection of specifications that combined together form an enabler for a service area, e.g. a download enabler, a browsing enabler, a messaging enabler, a location enabler, etc. The specifications that are forming an enabler should combined fulfill a number of related market requirements.
Minimum Functionality Description	Description of the guaranteed features and functionality that will be enabled by implementing the minimum mandatory part of the Enabler Release. .

3.3 Abbreviations

DS	Data Synchronization
DTD	Document Type Definition
ERDEF	Enabler Requirement Definition
ERELD	Enabler Release Definition
OMA	Open Mobile Alliance
SCR	Static Conformance Requirements
SyncML	Synchronization Mark-up Language
XML	Extensible Mark-up Language

4. Introduction

This document outlines the Enabler Release Definition for DS and the respective conformance requirements for client and server implementations claiming compliance to the Open Mobile Alliance DS v1.2 specifications.

It should be understood that the OMA SyncML Common v1.2 specifications must be used in conjunction with the OMA Data Synchronization Enabler Release, version 1.2. Fully conformant DS client and DS server implementations can only be achieved through combining the conformance requirements outlined within this enabler release definition with those outlined within the SyncML Common Specifications [ELREDSC] enabler release definition.

The DS release provides for the definition and promotes a set of universal specifications for data synchronization.

The goal of a common synchronization protocol is symmetric. It would connect any to any, over any network. That is, it would:

- Synchronize networked data with any mobile device
- Synchronize a mobile device with any networked data

The data synchronization protocol would synchronize networked data with many different devices, including handheld computers, mobile phones, automotive computers, and desktop PCs. A user could access and manipulate the same set of data from different devices. For example, a user could read e-mail from either a handheld or a mobile phone, and still maintain a consistent, updated record of which messages had been read.

Similarly, with any-to-any synchronization, mobile devices could support more types of data, including e-mail, calendar, contact management information, enterprise data stored in databases, and documents on the web. With such functionality a user who received an order via e-mail could access the company inventory system on the same device to determine a delivery date.

To accomplish this goal, the protocol needs the following characteristics:

- Operate effectively over wireless and wire line networks
- Support a variety of transport protocols
- Support arbitrary networked data
- Enable data access from a variety of applications
- Address the resource limitations of the mobile device
- Build upon existing Internet and Web technologies
- The protocol's minimal function needs to deliver the most commonly required synchronization capability across the entire range of devices.

The OMA Data Synchronization release provides for the definition of a set of universal specifications for data synchronization. They are based on the OMA Data Synchronization v1.1.2 specifications. Any changes are restricted to previous requirements and change requests identified in the SyncML Initiative, Ltd.

5. Description of Differencies from Previous Version

Information regarding differences between OMA DS v1.2 and v1.1.2 and can be found in the informative DS Change History White Paper [CHANGEHIST].

6. Document listing for DS 1.2

This section is normative.

Doc Ref	Permanent Document Reference	Description
Requirement Document		
	Not applicable	
Architecture Document		
	Not applicable	
Technical Specifications		
[EMAILOBJ]	OMA-TS-DS_DataObjEmail-V1_2-20060316-C	Specification that defines the email data object. The content-specific aspects of synchronization (filtering keywords, etc…) are listed and clarified.
[FILEOBJ]	OMA-TS-DS_DataObjFile-V1_2-20060316-C	Specification that defines the file data object. The content-specific aspects of synchronization (filtering keywords, etc…) are listed and clarified.
[FOLDEROBJ]	OMA-TS-DS_DataObjFolder-V1_2-20060316-C	Specification that defines the folder data object. The content-specific aspects of synchronization (filtering keywords, etc…) are listed and clarified.
[DSREPU]	OMA-TS-DS_DataSyncRep-V1_2-20060316-C	Specification that defines the subset of the Common Specifications SyncML Representation Specification necessary to define the Data Synchronization commands and protocol, with examples and commentary specific to DS.
[DSDEV]	OMA-TS-DS_DevInf-V1_2-20060316-C	Specification that defines exchange of device specific information, including hardware, firmware, software levels, available memory and local databases supported.
[DSPRO]]	OMA-TS-DS_Protocol-V1_2-20060316-C	Specification that defines how SyncML Common messages conforming to the DTD are exchanged in order to allow an OMA DS client and server to exchange additions, deletions, updates and other status information.
Supporting Files		
[W5APPCHAR]	OMA-TS-DS-W5AppChar-V1_2-20040601-C	Application characteristics. Working file in AC directory: file: ac_w5_ds-v1_2.txt path: http://www.openmobilealliance.org/tech/omna/dm-ac/
[DSDEVDTD]	OMA-TS-DS-DevInf-DTD-V1_2-20060316-C	DTD for the OMA DS Device Information. Working file in DTD directory: file: DS_DevInf-V1_2.dtd path: http://www.openmobilealliance.org/tech/dtd/

Table 1 Listing of Documents in DS 1.2 Enabler

7. Minimum Functionality Description for DS

This section is informative.

7.1 Minimum Functionality of DS Client Implementations

This section is informative.

The list of minimum functionality for a DS client is very numerous. Please refer to the Enabler Release specification baseline listed in section 6.

7.2 Minimum Functionality of DS Server Implementations

This section is informative.

The list of minimum functionality for a DS server is very numerous. Please refer to the Enabler Release specification baseline listed in section 6.

8. Conformance Requirements Notation Details

This section is informative

The tables in following chapters use the following notation:

Item:
Entry in this column MUST be a valid ScrItem according to [IOPPROC].

Feature/Application:
Entry in this column SHOULD be a short descriptive label to the **Item** in question.

Status:
Entry in this column MUST accurately reflect the architectural status of the **Item** in question.
- M means the **Item** is mandatory for the class
- O means the **Item** is optional for the class
- NA means the **Item** is not applicable for the class

Requirement:
Expression in the column MUST be a valid TerminalExpression according to [IOPPROC] and it MUST accurately reflect the architectural requirement of the **Item** in question.

9. ERDEF for DS - Client Requirements

This section is normative.

Table 2 ERDEF for DS Client-side Requirements

Item	Feature / Application	Status	Requirement
OMA-ERDEF-DS-C-001	DS Client	M*	[DSREPU] AND [DSPRO] AND [DSDEV]

*It should be understood that the OMA SyncML Common v1.2 specifications must be used in conjunction with the OMA Data Synchronization Enabler Release, version 1.2. Fully conformant DS client implementations can only be achieved through combining the conformance requirements outlined above with those outlined within the SyncML Common Specifications enabler release definition [ELREDSC].

10.ERDEF for DS - Server Requirements

This section is normative.

Table 3 ERDEF for DS Server-side Requirements

Item	Feature / Application	Status	Requirement
OMA-ERDEF-DS-S-001	DS Server	M*	[DSREPU] AND [DSPRO] AND [DSDEV]

*It should be understood that the OMA SyncML Common v1.2 specifications must be used in conjunction with the OMA Data Synchronization Enabler Release, version 1.2. Fully conformant DS server implementations can only be achieved through combining the conformance requirements outlined above with those outlined within the SyncML Common Specifications enabler release definition [ELREDSC].

Appendix A. Change History (Informative)

A.1 Approved Version History

Reference	Date	Description
OMA-ERELD-SyncML-DS-1.1.2-20030612-A	12 June 2003	Approved by TP. TP ref# OMA-TP-2003-0264R1

A.2 Draft/Candidate Version 1.2 History

Document Identifier	Date	Sections	Description
Draft Versions OMA-ERELD-SyncML-DS-v1_2	12 Dec 2003		Initial Draft
	16 Dec 2003		No longer using SyncML continuing activities template Added object specifications to scope
	22 Dec 2003		Removed reference to DataTypes specification
	19 Jan 2004		Changes dates, definitions.
	05 May 2004	Various; TP, 1	Clerical changes from Consistency Review; Updated date; ; Updated Scope to address Consistency Review #3(1, 3);
Candidate Version OMA-ERELD-SyncML-DS-v1_2	01 Jun 2004	n/a	Status changed to Candidate by TP TP ref # OMA-TP-2004-0178-DS-V1_2-for-candidate
Candidate Version OMA-ERELD-DS-v1_2	16 Mar 2006	ERELD	Template update, filename updated, clerical no CR. Class 2 & 3 CRs agreed against: OMA-TS-DS_DataObjEmail-V1_2-20060316-C OMA-TS-DS_DataObjFile-V1_2-20060316-C OMA-TS-DS_DataObjFolder-V1_2-20060316-C OMA-TS-DS_DevInf-V1_2-20060316-C OMA-TS-DS_Protocol-V1_2-20060316-C OMA-TS-DS_DataSyncRep-V1_2-20060316-C OMA-TS-DS-W5AppChar-V1_2-20040601-C OMA-TS-DS-DevInf-DTD-V1_2-20060316-C