



XML Document Management Architecture

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1. Scope (Informative)

This document presents an overview of the XML Document Management (XDM) enabler. Specifically, it serves as an introduction to the functionality and architecture (i.e. logical entities and reference points between them) of the XDM enabler.

2. References

2.1 Informative References

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- [RFC4825] “The Extensible Markup Language (XML) Configuration Access protocol (XCAP)” J.Rosenberg, May, 2007, URL: <http://www.ietf.org/rfc/rfc4825.txt>

3GPP/3GPP2

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- [3GPP2 X.S0013-002-A] 3GPP2 X.S0013-002-A “All-IP Core Network Multimedia Domain: IP Multimedia Subsystem - Stage 2”, Revision A, Version 1.0, 3GPP2, 2005, URL: http://www.3gpp2.org/Public_html/specs/
- [3GPP TS 33.222] 3GPP TS 33.222 “Generic Authentication Architecture (GAA); Access to network application functions using Hypertext Transfer Protocol over Transport Layer Security (HTTPS) (Release 6)” URL: http://www.3gpp.org/ftp/Specs/archive/33_series/33.222/

OMA References

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- [OMA-DICT] “Dictionary for OMA Specifications”, Version 2.6, Open Mobile Alliance™, OMA-ORG-Dictionary-V2_6, URL: <http://www.openmobilealliance.org>
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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.

3.2 Definitions

Context Collaboration Model	An extension of the Context Model. It expands on the Context Model by describing the interactions (collaborations) between the entities of this architecture and external entities (e.g. entities in other architectures).
Contextual Item	A logical entity in an architecture
Context Model	A model that identifies all contextual items relevant to understanding architecture.
Presence	Defined in [OMA-RD-Presence_SIMPLE]
Presence Authorization Policies	Defined in [OMA-RD-Presence_SIMPLE].
Presence Information	Defined in [OMA-RD-Presence_SIMPLE].
Principal	An entity that has an identity, that is capable of providing consent and other data, and to which authenticated actions are done on its behalf. Examples of principals include an individual user, a group of individuals, a corporation, service enablers/applications, system entities and other legal entities. [OMA-DICT]
XDM Client	The XDMC is a client entity that provides access to the various XDMS features. [See also 7.1.1]
XCAP Server	The XCAP Server manages XML documents. [See also 7.2.1]

3.3 Abbreviations

GAA	Generic Authentication Architecture
OMA	Open Mobile Alliance
IETF	Internet Engineering Task Force
PoC	Push to talk over Cellular
SIP	Session Initiation Protocol [RFC3261]
TLS	Transport Layer Security
UE	User Equipment
XCAP	Extensible Markup Language (XML) Configuration Access Protocol
XDM	XML Document Management
XDMC	XML Document Management Client
XDMS	XML Document Management Server

4. Introduction

(Informative)

This Architecture Document describes the features and architecture of the OMA XML Document Management enabler.

The XML Document Management (XDM) defines a common mechanism that makes user-specific service-related information accessible to the service enablers that need them. Such information is expected to be stored in the network where it can be located, accessed and manipulated (created, changed, deleted, etc.). XDM specifies how such information will be defined in well-structured XML documents, as well as the common protocol for access and manipulation of such XML documents. The XML Configuration Access Protocol (XCAP) [RFC4825], as defined by IETF, has been chosen as the common XML Document Management protocol.

The XDM Specification [OMA-TS-XDM_Core] defines the feature:

- The common protocol, XML Configuration Access Protocol (XCAP), by which principals can store and manipulate their service-related data, stored in a network as XML documents.

Documents accessed and manipulated via XCAP are stored in logical repositories in the network, called XML Document Management Servers (XDMS). Each repository may be associated with a functional entity which uses its data to perform its functions. (For example, a PoC server accesses a PoC XDMS to obtain a particular type of user document, a PoC Group document, which provides the member list for a PoC group session, and uses this information to invite such members for a PoC session.)

The Shared XDM Specification [OMA-TS-XDM_Shared] specifies a specific type of repository, called a Shared XDMS, which stores documents which can be reused by other enablers. This enabler specifies two such documents:

- the URI List, which is a list of URIs
- the Group Usage List, which is a list of group names or service URIs that are known by the XDMS.

Due to the reusable nature of the XDM enabler, there will be interactions with other service enablers, and therefore, the architectural design of the XDM enabler accommodates the needs of those enablers.

4.1 Target Audience

The target audience for this document includes but is not limited to the following:

- The Working Group(s) that will create specifications based on this subject matter
- Working Groups that need to understand this subject matter
 - OMA - POC WG
 - OMA - MWG
 - OMA – GS WG
 - OMA – DM WG
 - OMA – BAC WG
 - OMA – LOC WG
 - OMA – DS WG
 - OMA – MWS WG
- Architecture Working Group (e.g. during Architecture Reviews as defined in [ARCH-REVIEW], to determine compliance of [ARCH-PRINC], etc.)
- Interoperability Working Group (e.g. for early analysis of interoperability requirements)

4.2 Requirements

All the requirements as defined in the [OMA-RD-XDM] are met with this document.

5. Features (Informative)

Documents accessed and manipulated via XCAP are stored in (logical) repositories in the network, called generically XML Document Management Servers (XDMS), each repository being associated with a functional entity which uses the data in its associated repository to perform its functions. For example, a PoC server accesses a PoC XDMS to obtain a particular type of user document, a PoC Group document, which provides the member list for a PoC group session, and uses this information to invite such members for a PoC session.

The following sub-sections provide a high level description of the principal features of the XDM enabler.

5.1 Authentication

XDM clients must be authenticated before accessing any XDM services. Depending on the location of the XDMS (e.g. terminal or application server), this authentication may occur in multiple levels. For example, an XDMS located in a terminal is authenticated by the Aggregation Proxy using a particular mechanism. Alternatively an XDMS located in application server is authenticated directly by the XDMS using mechanisms outside the scope of the present specification.

5.2 Document Management Operations

This section describes the generic operations that can be performed on documents managed by the XDM enabler. The Document Management Operations should include the XCAP operations against XDMS. The XDM enabler supports the following operations that can be performed on a document:

- Creating or replacing a document
- Deleting a document
- Retrieving a document
- Creating or replacing an XML element
- Deleting an XML element
- Retrieving an XML element
- Creating or replacing an XML attribute for an XML element
- Deleting an XML attribute
- Retrieving an XML attribute

Note that some documents might not support all operations.

5.3 Void

6. Context Model (Informative)

6.1 Context Collaboration Model

6.1.1 Functions

The XDM enabler provides the following functionality:

- 1) Manipulation of XML documents stored in an XDM Server (XDMS) by the XDM Client (XDMC).

Manipulation of XML documents is achieved using the XCAP protocol, between the XDMC and the XDMS storing the data. Authentication is described in Section 5.1

6.1.2 Collaboration with other Service Enablers

The collaboration of the XDM enabler with other enablers has several aspects:

- Terminals use the aggregation proxy to communicate more efficiently with enabler-specific XDMSs as well as the Shared XDMS
- Enabler-specific application servers directly communicate with the Shared XDMS using XCAP.
- Enabler specifications utilize the XDM specifications to define their own XML documents. Enabler-specific applications servers communicate with XDMSs using XCAP.

7. Architectural Model

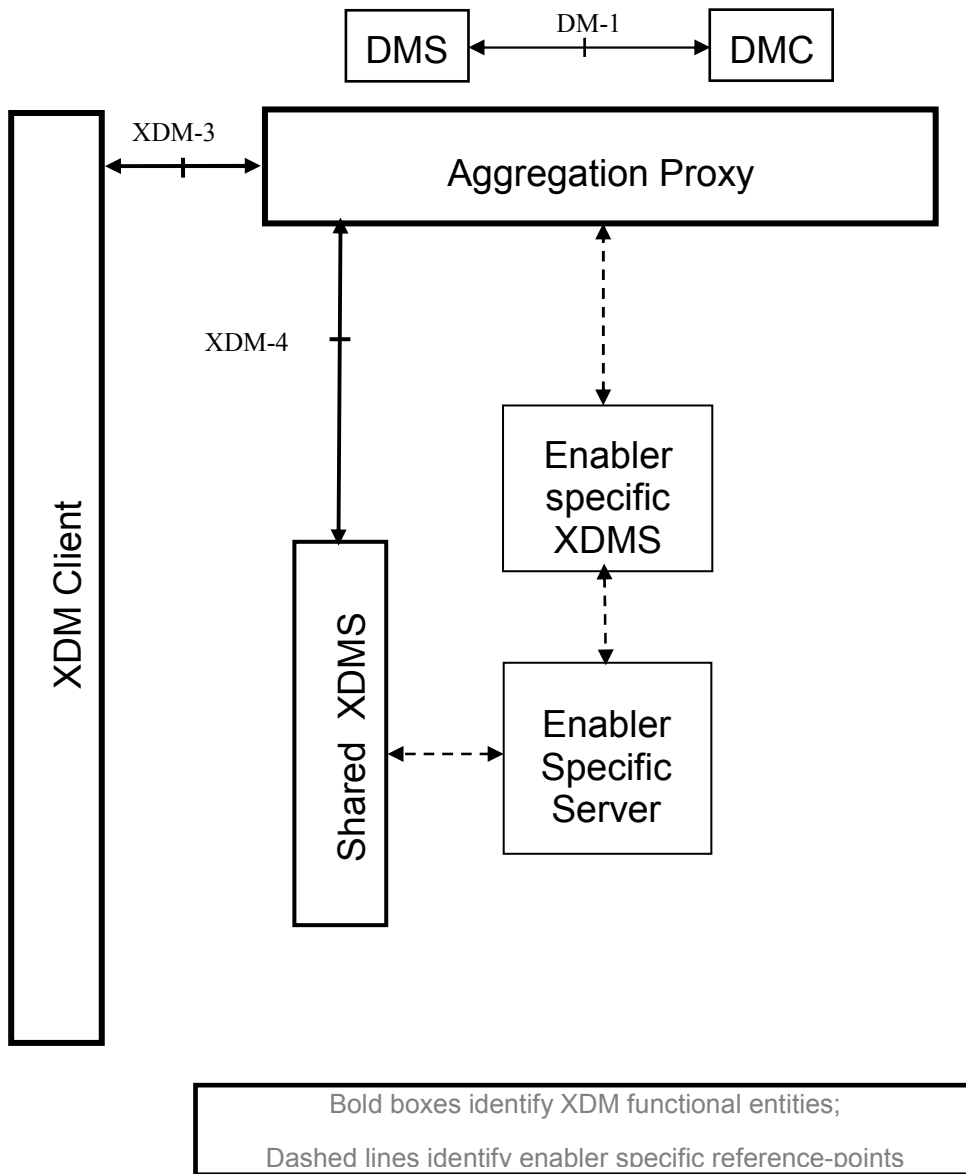


Figure 1: XML Document Management Architecture

7.1 XML Document Management Functional Entities

7.1.1 XML Document Management Client

The XDMC is a client entity that provides access to the various XDMS features as described in Section 5. An application implementing an XDMC may implement various subsets of those features, as required, subject to certain mandatory requirements described in [OMA-TS-XDM_Core].

The XDMC can be implemented in both terminal and server entities.

7.1.2 Aggregation Proxy

The Aggregation Proxy is the contact point for the XDM Client implemented in an UE to access XML documents stored in any XDMS. The Aggregation Proxy performs the following functions:

- Performs authentication of the XDM Client;
- Routes individual XCAP requests to the correct XDMS;
- Optionally supports charging;
- Optionally performs compression/decompression.

7.1.3 Shared XML Document Management Server

The Shared XDMS is a server that supports the following functions:

- Manages and supports content of URI List and Group Usage List XML documents as described in [OMA-TS-XDM_Shared_List];
- Performs authorisation of incoming XCAP requests.

7.2 Enabler specific Functional Entities

Each of these functional entities are defined in the specifications for the enabler in question

7.2.1 Enabler specific XML Document Management Server

The enabler specific XDMSs are XCAP Servers that supports the following functions:

- Performs authorisation of incoming XCAP requests;
- Manages XML documents, which are specific to the service enabler.

7.2.2 Enabler specific Server

The functionality of the enabler specific Servers are defined in the specifications for the enabler in question.

7.3 External Entities Providing Services to XML Document Management

7.3.1 SIP/IP Core (Void)

The use of this entity is not specified in this release.

7.3.2 Device Management Server

The Device Management (DM) Server [OMA-DM] performs the following function:

- Initialisations and updates of all configuration parameters necessary for XDMC.

7.3.3 Device Management Client

The Device Management Client performs the following functions in support of an XDMC residing in a UE:

- Receives the initial configuration parameters and the updated parameters needed for XDM service sent by the Device Management Server.

7.4 Description of Reference Points

7.4.1 Reference Point XDM-1: XDM Client – SIP/IP Core (Void)

Use of this reference point is not supported in this release.

7.4.2 Reference Point XDM-2: Shared XDMS – SIP/IP-Core (Void)

Use of this reference point is not supported in this release.

7.4.3 Reference Point XDM-3: XDM Client – Aggregation Proxy

The XDM-3 reference point is between the XDM Client and the Aggregation Proxy. The protocol for the XDM-3 reference point is XCAP.

The XDM-3 reference point provides the following functions:

- XML document management (e.g. create, modify, retrieve, delete);
- Mutual authentication between XDMS and Aggregation Proxy;
- Optional compression.

When the SIP/IP Core network corresponds with 3GPP/3GPP2 IMS, then the XDM-3 reference point conforms to the Ut reference point [3GPP TS 23.002] [3GPP2 X.S0013-000-A].

7.4.4 Reference Point XDM-4: Aggregation Proxy – Shared XDMS

The XDM-4 reference point is between the Aggregation Proxy and the Shared XDMS. The protocol for the XDM-4 reference point is XCAP.

The XDM-4 reference point provides the following functions:

- Shared XML document management (e.g. create, modify, retrieve, delete).

7.4.5 Reference Point DM-1: DM Client – DM Server

The DM-1 reference point is described in [OMA-DM]. The XDM enabler will define the XDM configuration object(s).

7.4.6 Reference Points: “Enabler specific XDMS” - SIP/IP Core (Void)

Use of this reference point is not supported in this release.

7.4.7 Reference Points: “Enabler specific Server” - SIP/IP Core (Void)

Use of this reference point is not supported in this release.

7.4.8 Reference Points: Aggregation Proxy – “Enabler specific XDMS”

Each of these reference points are named in the specification for the enabler in question and owned by it. The basic XML Document Management requirements for the reference points are described in the XDM core specification [OMA-TS-XDM_Core]. The enabler unique requirements for the reference points are described in the XDM enabler specification.

They provide the following function:

- “Enabler specific” XML document management (e.g. create, modify, retrieve, delete).

7.4.9 Reference Points: Shared XDMS – “Enabler specific Server”

Each of these reference points are named in the specification for the enabler in question and owned by it. The requirements for the reference points are described in the XDM enabler specification [OMA-TS-XDM_Core] and in the enabler specific specification.

The protocol for the reference points is XCAP

They provide the following function:

- Transfer of URI Lists to the enabler specific server.

7.4.10 Reference Points: “Enabler specific XDMS” – “Enabler specific Server”

Each of these reference points are named by and defined in the specifications for the enabler in question.

The protocol for the reference points is defined in the specifications for the enabler in question.

They provide the following function:

- Transfer of enabler specific data from the enabler specific XDMS to the enabler specific server.

7.5 Access Control

This release of the XDM specifications defines a default access control policy, which is that only the creator of a document is allowed to perform all XDM actions to the document. Also application servers of the trusted networks are allowed to read the document. No other entities are allowed to access the document.

A permissions-based system, in which more elaborate access policies are defined, may be included in future releases of XDM.

7.6 Security

The XDMC is to be authenticated prior to accessing the XDM service as specified in [RFC4825]. TLS is used as specified in [RFC4825] in order to provide integrity and confidentiality protection to the exchanged messages. HTTP Digest is the default authentication mechanism.

For a 3GPP realisation the Generic Authentication Architecture (GAA) as an underlying network mechanism is used as specified in [3GPP TS 33.222] to provide the XDM service security if GAA is present; otherwise requirements as above applies.

7.7 Charging

Appropriate charging mechanisms may need to be provided by the underlying network or other suitable entities in order to support the charging requirements described in [OMA-RD-XDM].

Description of how charging is performed is beyond the scope of the present specification.

7.8 XML Document Management Service Provisioning

The XML Document Management (XDM) Service provider can set up the XDM Service configurations remotely in the terminal device by using the device management mechanism specified in [OMA-PRO-AD]. The updates of the XDM Service configurations are remotely performed in the terminal device by using [OMA-DM].

A UE running the XDMC, compliant with [OMA-PRO-UA] is able to receive the contents sent by the service provider. The exact syntax and definition of parameters needed for the XDM enabler are specified in [OMA-PRO-CONT]. The bootstrap mechanism defined in [OMA-PRO-SEC] and [OMA-DM] are used to enhance the security of the provisioning.

Appendix A. Change History

(Informative)

A.1 Approved Version History

Reference	Date	Description
OMA-AD-XDM-V1_0	12 Jun 2006	Status changed to approved OMA-TP-2006-0196R03-INP_XDM_V1_0_for_final_approval.
	17 Nov 2006	CR incorporated: OMA-PAG-2006-0689R01

A.2 Draft/Candidate Version V1.1 History

Document Identifier	Date	Sections	Description
Draft Versions OMA-AD-XDM-V1_1	01 Jul 2007	2.1, 3.2, 3.3, 7, 7.1.1, 7.1.3, 7.3.2, 7.3.3, 7.4.3, 7.4.10,	Baseline based on OMA-AD-XDM-V1_0_1-20061117-A as per OMA-PAG-2007-0399R02-INP_XDM_1_1_baseline Incorporated CR: OMA-PAG-2007-0478
	02 Jul 2007	2.1, 4, 5.3, 6.1.1, 7, 7.2.1, 7.3.1, 7.4.1, 7.4.2, 7.4.6, 7.4.7,	Incorporated CR: OMA-PAG-2007-0411R02
	30 Aug 2007	2, 4	Incorporated CR: OMA-PAG-2007-0535
	09 Oct 2007	4, 5.2, 6.1.2, 7.1.2, 7.1.3, 7.4.4	Incorporated CR: OMA-PAG-2007-0603 OMA-PAG-2007-0604 OMA-PAG-2007-0605
	11 Dec 2007	4, 7.3.1	Editorial changes
	13 Dec 2007	3.1	OMA-PAG-2007-0879
Candidate Versions OMA-AD-XDM-V1_1	28 Jan 2008	n/a	Status changed to Candidate by TP TP ref # OMA-TP-2007-0505R03-INP_XDM_V1_1_for_Candidate_approval