



OMA Global Service Architecture Overview

Candidate Version 1.0 – 26 Jan 2010

Open Mobile Alliance

OMA-OD-OGSA-V1_0-20100126-C

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1. Scope

This document describes the OMA Global Service Architecture (OGSA) that is a service architectural view of OMA Enablers leveraging OSE (OMA Service Environment). The main scope of OGSA is to support new (and/or revised) Enabler specifications clarifying how they fit with the OSE. For this reason, when creating a new (or revised) Enabler, OGSA will:

- identify the dependencies between the being-defined (or revised) Enabler and other OMA Enablers
- compile which interfaces the being-defined (or revised) Enabler exposes;

How the relevant OMA WG will specify the being-defined (or revised) Enabler is out of scope of the OGSA work.

Influencing other SDOs is out of scope of the OGSA work: in case overlaps with other SDOs specifications should come out, these will be managed as in OMA process.

Material for a specific enabler will only be included in this document for enablers where the Architecture Document has reached Candidate or Approved status.

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3. Terminology and Conventions (Normative)

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 are informative, unless they are explicitly indicated to be normative.

3.2 Definitions

OGSA Suite	An arbitrary grouping of enablers as a cataloguing or representational convention.
OGSA View	A representation of the interfaces specified and exposed by a specific Enabler and/or its components.
Service architectural view	A term representing the combined architecture for the portfolio of offerings made available by a service provider accessible over.

3.3 Abbreviations

3GPP	3 rd Generation Partnership Project
ACMO	Application Characteristics/Management Object
AD	Architecture Document
ADRR	Architecture Document Review Report
API	Application Programming Interface
ASP	Applications Service Provider
BCAST	Mobile Broadcast Services
BSS	Business Support System
CAB	Converged Address Book
CBCS	Categorization Based Content Screening
CBUS	Condition Based URIs Selection
CHRG	Charging
CMI	Content Management Interface
CMR	Customised Multimedia Ringing
ConnMO	Connectivity Management Object
CP	Client Provisioning
CPM	Converged IP Messaging
CR	Change Request
CSCSF	Client Side Content Screening Framework
DCD	Dynamic Content Delivery
DCMO	Device Capability Management Object
DiagMon	Diagnostics and Monitoring
DLOTA	Download Over The Air
DM	Device Management
DNS	Domain Name System

DPE	Device Profiles Evolution
DRM	Digital Rights Management
DS	Data Synchronization
EFI	External Functionality Interface
EMN	E-Mail Notification
FUMO	Firmware Update/Management Object
GPM	Global Permissions Management
GS-CSI	Games Services Client Server Interface
GSSM	General Service Subscription Management
HTTP	Hypertext Transfer Protocol
IETF	Internet Engineering Taskforce
IM	Instant Messaging
IMF	Identity Management Framework
IMPS	Instant Messaging Presence Service
IMS	IP Multimedia Subsystem
IMSinOMA	Utilization of IMS Capabilities in OMA
IP	Internet Protocol
LAWMO	Lock And Wipe Management Object
LFC	Look and Feel Customization
LOCSIP	Location in SIP/IP Core
MEM	Mobile E-Mail
MLP	Mobile Location Protocol
MLS	Mobile Location Services
MMMD	Multi-modal Multi-device
MMS	Multimedia Messaging Service
MobAd	Mobile Advertising
MSRP	Message Session Relay Protocol
NI	Network Identity
OASIS	Organization for the Advancement of Structured Information Standards
OBKG	On-Board Key Generation
OCM	OGSA Change Management
OCSP	Online Certificate Status Protocol Mobile Profile
OGSA	OMA Global Service Architecture
OMA	Open Mobile Alliance
OSE	OMA Service Environment
OSS	Operations Support System
OWSER	OMA Mobile Web Services
OWSER-NI	OWSER Network Identity
PEEM	Policy Evaluation, Enforcement, and Management
PIOSE	Parlay In OSE

POC	Push-to-talk Over Cellular
PSA	Parlay Service Access
REL	Release Planning and Management committee
RLS	Resource List Server
RME	Rich Media Environment
RTCP	Real Time Control Protocol
RTP	Real Time Transport Protocol
SC	Device Management Smart Card
SCE	Secure Content Exchange
Sched	Device Management Scheduling
SCIDM	Secure Content Identification Mechanism
SCOMO	Software Component Management Object
SCWS	Smart Card Web Server
SDO	Standards Development Organization
SDP	Session Description Protocol
SEC_CF	Applicaation Layer Security Common Functions
SIMPLE	SIP for Instant Messaging and Presence Leveraging Extensions
SIMPLE IM	SIMPLE - Instant Messaging
SIP	Session Initiation Protocol
SRM	Secure Removable Module
STI	Standard Transcoding Interface
SUPL	Secure User Plane Location
SVG	Scalable Vector Graphics
TPP	Third Party Pays
UAPProf	User Agent Profile
URI	Uniform Resource Identifier
URI	OMA URI Schemes
VAS	Value Added Service
WAP	Wireless Application Protocol
WG	Working Group
WID	Work Item Description
WPKI	Wireless Public Key Infrastructure
WSBPEL	Web Services Business Process Execution Language
WSI	Web Services IF for Device Management
XCAP	XML Configuration Access Protocol
XDM	XML Document Management
XDMC	XML Document Management Client
XDMS	XML Document Management Server
XML	Extensible Markup Language

4. Introduction

4.1 Objectives

The OGSA defines an overall service architectural view of OMA Enablers leveraging OSE, such that when creating a new or revised Enabler, a WG may identify the context of the Enabler being defined.

The OGSA

- positions the OMA enablers in OGSA Suite(s),
- facilitates the justification for and representation for Enablers (not just individually but in a wider context), and helps operators and external entities understand and leverage OMA Enablers,
- represents a re-usable set of enablers and exposed interfaces,
- illustrates modularity.

4.2 Version 1.0

Version 1.0 of OGSA contains an architectural view of the following OMA Enablers:

- Categorization based Content Screening [OMA-CBCS-AD]
- Charging [OMA-CHRG_AD]
- Dynamic Content Delivery [OMA-DCD-AD]
- Policy Evaluation, Enforcement, and Management [OMA-PEEM_AD]
- XML Document Management [OMA-XDM_AD]

5. Generic View Diagram

5.1 Description

5.1.1 OGSA Suites and Enablers

Showing OMA enablers and their dependencies results in a complex and large picture. Figure 1 below illustrates how such a picture might look like.

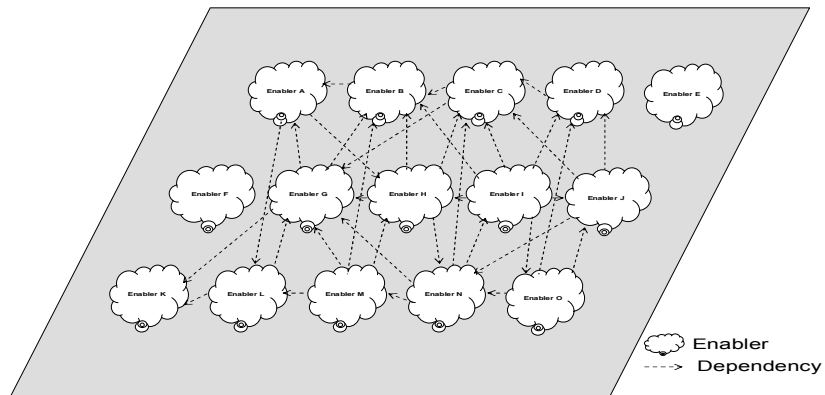


Figure 1: Representation of the OMA Enablers and their possible dependencies

The term “suite” is used to represent an arbitrary grouping of enablers as a cataloguing or representational convention. In the Service Architecture View, multiple suites may be identified, and some enablers may be included in more than one suite.

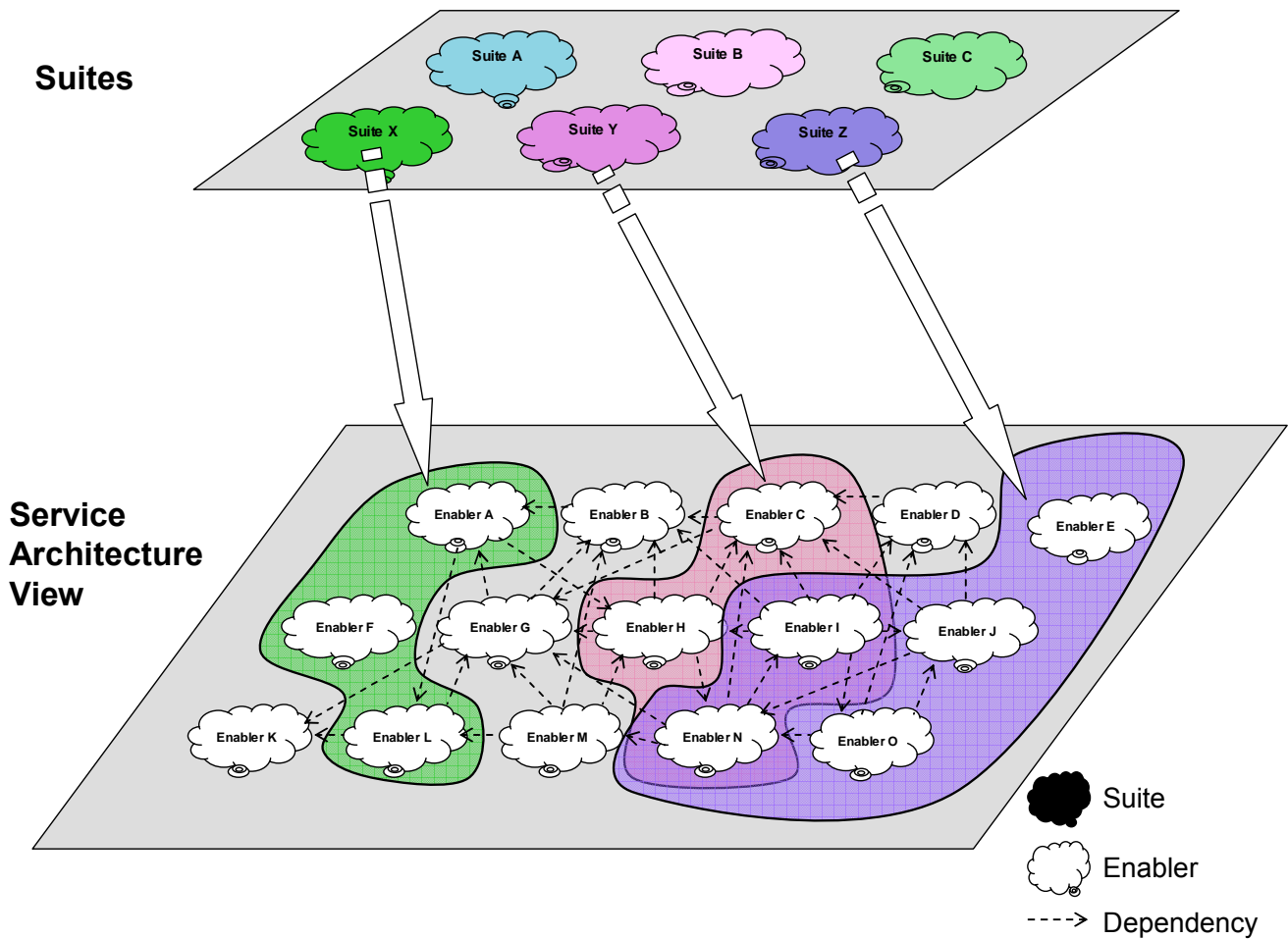


Figure 2: OGSA Suites mapping to multiple Enablers

In Figure 2, three OGSA Suites examples are shown:

- Suite X: contains Enablers A, F and L
- Suite Y: contains Enablers C, H, I and N
- Suite Z: contains Enablers E, I, J, N and O

As may be seen from the example, multiple OGSA Suites may be defined. A Enabler may be represented in multiple OGSA Suites, and in the above example, Enablers I and N are used by OGSA Suites Y and Z.

5.1.2 Using OGSA Suites

The creation of a Service Architecture View through the suites concept may assist in helping to review and compare the architectures of related enablers when updating existing or creating new enablers.

The following sections provide informative examples of how existing and new enablers may benefit from suites.

5.1.3 Existing Enablers

There are existing Enablers in OMA, where the duplication or overlap of functions or components of other enablers has introduced silos into the OMA and complicates implementations and deployments.

To help understand the use of OGSA Suites when evolving existing Enablers, consider (for example), Enabler C (see Figure 2) being further developed to add new functionality. When considering the new functionality for Enabler C, firstly the OGSA Suite(s) to which it is associated is reviewed as part of Enabler C's development.

As Enabler C is in OGSA Suite Y, then the functions of the architectures of Enablers H, I and N are required to be considered and taken into account (as well as possibly others). In the event that an Enabler is in multiple OGSA Suites, the functions of the architectures of the Enablers in those OGSA Suites also require to be taken into account. As a consequence of reviewing the related functions of the architectures within OGSA Suite Y, the proposed development of Enabler C may result in Enabler C adopting parts of the functionality of the architectures already defined in Enablers H, I and/or N, or its development being influenced by them. Additionally, enablers in other suites may also be considered as part of this evaluation.

5.1.4 New Enablers

New enablers define the architectures needed to support their requirements. Some enablers may not be aware of, or may even not take into account, existing functions or components of existing enablers for the new enabler. This may lead to silos.

The new Enabler will be assigned to an OGSA Suite once the RD is approved as Candidate. The working group can then carefully consider re-using/extending the Enablers in the same OGSA Suite(s), instead of creating new ones. Additionally, enablers in other suites may also be considered as part of this evaluation.

To help understand the use of OGSA Suites when creating new Enablers, consider (for example) Enabler D (see Figure 2) being created. When considering the new functionality for Enabler D, the OGSA Suite(s) to which it may be associated are reviewed as part of Enabler D's development.

After initial analysis, let's assume that Enabler D is assigned to OGSA Suite Z, and consequently the functions of the architectures of Enablers E, I, J, N and O are required to be considered and taken into account. As a consequence of reviewing the related functions of the architectures within OGSA Suite Z, the proposed development of Enabler D may result in Enabler D adopting parts of the functions of the architectures/functionality already of the architectures defined in Enablers E, I, J, N and/or O, or its development being influenced by them.

5.2 OGSA and OGSA view in OSE

The OGSA suites in the context of the OMA Service Environment (OSE) [OMA-OSE] are depicted in Figure 3.

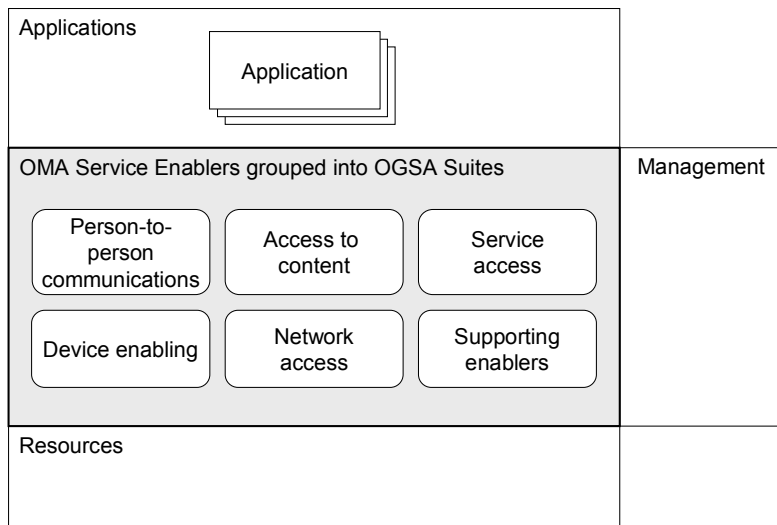


Figure 3: OGSA Suites in the context of OSE

The OMA Services Enablers are grouped into OGSA Suites.

Applications are a primary means for initiating and consuming an Enabler. See also [OMA-OSE].

Resources provide capabilities and exposes functionality provided by service providers, operators’ networks, terminals, etc that may be used by Enablers developed in OMA. See also [OMA-OSE].

Management includes various business support functions for services like subscriber management, software life cycle management and/or contains backend resources (e.g. BSS or OSS).

5.3 Dependencies (Normative)

OGSA is dependent on all Enablers identified in section 4.2.

5.4 Modelling the generic view diagram (Normative)

In order to facilitate the reuse a simple intuitive diagram depicting OGSA View is introduced. OGSA View MUST describe and give a graphical overview of the components of the enabler and the IO interfaces, which expose enabler functionality.

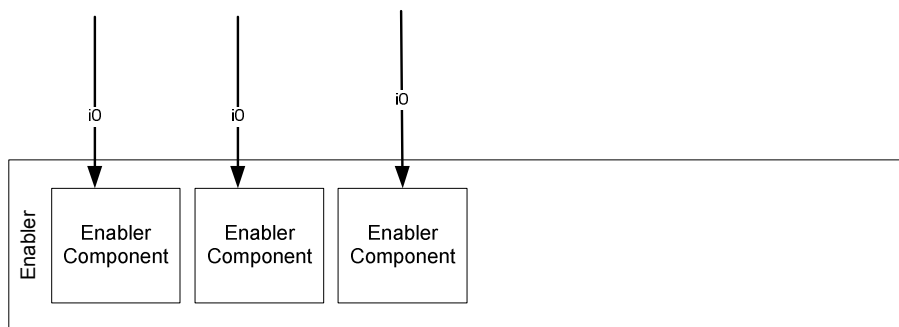


Figure 4: OGSA View

6. Description of selected Enablers in OGSA Suites

6.1 Person-to-person communications

The person-to-person communications OGSA Suite represents messaging and other communications means in their different forms that facilitate or encourage communication between users.

6.1.1 Enablers in this OGSA Suite

The Enablers in the person-to-person communications OGSA Suite are:

- Converged IP Messaging [OMA-CPM-AD]
- Instant Messaging Presence Service [OMA-Presence-AD]
- Mobile Email [OMA-MEM_AD]
- Multimedia Messaging Service [OMA-MMS_AD]
- Push to talk over cellular [OMA-POC_AD]
- SIMPLE Instant Messaging [OMA-SIMPLE-IM]

The following Enablers in early AD development stage belong to this OGSA Suite:

- Customised Multimedia Ringing [OMA-CMR_AD]

Figure 5 below gives a graphical overview of the Enablers belonging to this OGSA Suite.

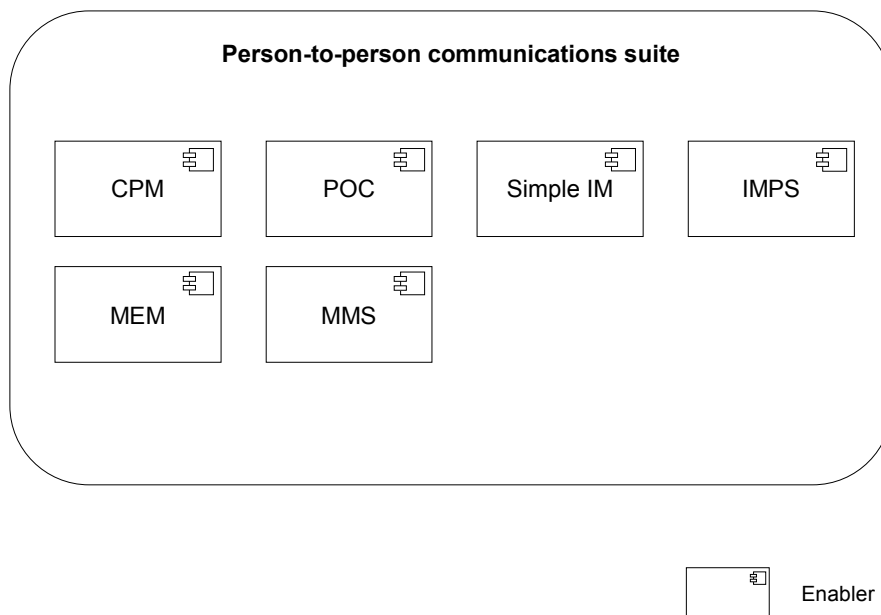


Figure 5: Enablers of the person-to-person communications OGSA Suite

6.1.2 Dependencies on other Enablers

The Enablers in this OGSA Suite have dependencies on the following other Enablers, taking into account are dependencies explicitly specified in the respective ADs of the Enablers, as well as mappings to data structures defined by the Enablers (e.g. Charging data elements).

- Browsing [OMA-WAP_AD]⁸
- Charging [OMA-CHRG_AD]
- Client Provisioning [OMA-CP_AD]
- Data Synchronisation [OMA-DS-AD]⁹
- Device Management [OMA-DM_AD]
- Digital Rights Management [OMA-DRM_AD]
- Email Notification [OMA-EMN_ERP]
- Location in SIP/IP Core [OMA-LOCSIP-AD]
- Mobile Location Service [OMA-MLS-AD]
- Presence SIMPLE [OMA-Presence-AD]
- Push [OMA-PUSH-AD]
- Push using SIP [OMA-SIP-PUSH-AD]
- Standard Transcoding Interface [OMA-STI-AD]
- User Agent Profile [OMA-UAPROF-ERP]
- Utilization of IMS capabilities [OMA-IMSinOMA-AD]
- XML Document Management [OMA-XDM_AD]

Table 1 depicts how the Enablers of this OGSA Suite are dependent on other Enablers.

Enabler	Relationship with															
	Browsing	CHRG	CP	DM	DRM	DS	EMN	IMSinOMA	LOCSIP	MLS	Presence	Push	SIPPush	STI	UAProf	XDM
CPM		x		x		x		x			x	x				x
IMPS																
MEM			x	x			x					x	x	x	x	
MMS	x	x	x	x	x									x	x	
POC		x		x				x			x					x
SIMPLE IM		x		x				x			x					x

Table 1: Dependencies of the Enablers in the person-to-person communications OGSA Suite on other Enablers

⁸ The AD of Browser_Protocol_Stack-V2_1 references the WAP Arch (see OMA-ERELD-Browser_Protocol_Stack-V2_1)

⁹ OMA DS is the successor of SyncML, since SyncML was renamed OMA DS in release 1.1.2.

6.1.3 Description of selected Enablers in this OGSA Suite

To be provided in a future release.

6.2 Access to content

The access to content OGSA Suite enables access to digital content through multiple terminals so that the terminals become entertainment devices, by providing architectures and functionalities enabling users to subscribe to, and/or be able to receive multimedia content.

6.2.1 Enablers in this OGSA Suite

The Enablers in the access to content OGSA Suite are:

- Browser Protocol Stack [OMA-BPS_ERP]¹⁰
- Browsing [OMA-WAP_AD]¹¹
- Digital Rights Management [OMA-DRM_AD]
- Dynamic Content Delivery [OMA-DCD-AD]
- Games Services Client Server Interface [OMA-GS_AD]
- Mobile Advertising [OMA-MobAd_AD]
- Mobile Broadcast Services [OMA-BCAST_AD]
- Multi-modal Multi-device [OMA-MMMD_AD]
- Rich Media Environment [OMA-RME_AD]
- Scalable Vector Graphics Mobile Domain [OMA-SVG-TS]
- Secure Content Exchange [OMA-SCE_AD]
- Secure Removable Media [OMA-SRM_AD]

The following Enablers in early AD development stage belong to this OGSA Suite:

- In-Game Advertising [OMA-IGA_AD]
- Mobile Codes [OMA-MC_AD]
- Secure Removable Media (next version 1.1) [OMA-SRM_AD_next]

¹⁰ The AD of Browser_Protocol_Stack-V2_1 references the WAP Arch (see OMA-ERELD-Browser_Protocol_Stack-V2_1)

¹¹ The AD of Browser Conformance for Interoperability references the WAP Arch (see OMA-ERELD-Browsing-V2_3)

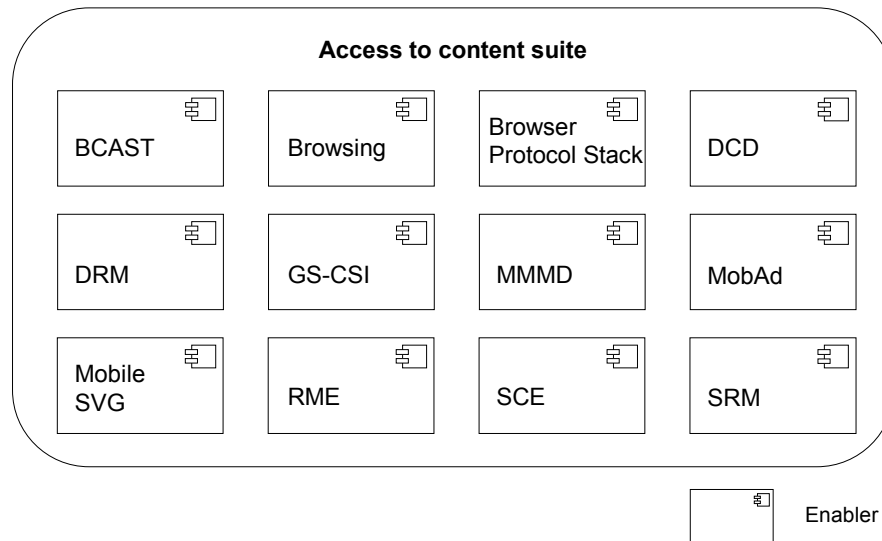


Figure 6: Enablers of the access to content OGSA Suite

6.2.2 Dependencies on other Enablers

The Enablers in this OGSA Suite have dependencies on the following other Enablers, taking into account dependencies explicitly specified in the respective ADs of the Enablers, as well as mappings to data structures defined by the Enablers (e.g. Charging data elements).

- Application Layer Security Common Functions [OMA-SEC_CF_AD]
- Browsing [OMA-WAP_AD]¹²
- Categorisation Based Content Screening [OMA-CBCS-AD]
- Charging [OMA-CHRG_AD]
- Client Provisioning [OMA-CP_AD]
- Client Side Content Screening Framework [OMA-CSCSF_AD]
- Dynamic Content Delivery [OMA-DCD-AD]
- Device Management [OMA-DM_AD]
- Device Profiles Evolution [OMA-DPE_AD]
- Digital Rights Management [OMA-DRM_AD]
- Mobile Broadcast Services [OMA-BCAST_AD]
- Mobile Location Protocol [OMA-MLP-TS]
- Mobile Location Services [OMA-MLS-AD]
- Online Certificate Status Protocol [OMA-OCSPMP-ERP]
- Presence SIMPLE [OMA-Presence-AD]

¹² The AD of Browser Conformance for Interoperability references the WAP Arch (see OMA-ERELD-Browsing-V2_3)

- Push [OMA-PUSH-AD]
- Push using SIP [OMA-SIP-PUSH-AD]
- Secure Content Exchange [OMA-SCE_AD]
- User Agent Profile [OMA-UAPROF-ERP]
- URI Schemes for the Mobile Applications Environment [OMA-URI-Schemes-ERP]

Table 2 depicts how the Enablers of this OGSA Suite are dependent on other Enablers.

Enabler	Relationship with																				
	BCAST	Browsing	CBCS	CHRG	CP	CSCSF	DCD	DM	DPE	DRM	MLP	MLS	OCSP	Presence	Push	SCE	SEC_CF	SIPPush	UAProf	URI	
BCAST				x				x		x	x										
Browser Protocol Stack																					
Browsing																					
DCD	x	x	x	x		x		x	x	x		x		x	x			x	x		
DRM																					
GS-CSI																					
MMMD																					
MobAd	x						x														
Mobile SVG																					
RME	x	x								x					x					x	
SCE										x			x								
SRM 1.0										x						x					

Table 2: Dependencies of the Enablers in the access to content OGSA Suite on other Enablers

6.2.3 Description of selected Enablers in this OGSA Suite

6.2.3.1 DCD Enabler V1_0

The OGSA View for DCD is based on the following specific document [OMA-DCD-AD].

The Dynamic Content Delivery (DCD) Enabler defines a common mechanism to enable periodic delivery of personalised or customized content either on a one-to-one (point-to-point) or one-to-many (broadcast) basis. The delivery of DCD Content may be based on the subscription and preferences of a user, operator or service provider. As a complementary delivery mechanism to the existing mechanisms, e.g. browsing, messaging, etc., it will reuse as much existing technology as possible, while providing the added benefits of delivery control management, and an enhanced user experience. The content delivery will support various network technologies (i.e. network types and/or bearers), and may operate autonomously in the background.

The DCD Enabler includes the following features:

- A generic Client framework that allows automated registration of DCD enabled applications;
- The ability to allow customization of the delivery of content by the DCD client in the broadcast scenario;
- The asynchronous delivery of content utilizing both point-to-point and broadcast bearers;
- Content delivery and subscription based notification mechanisms between DCD Client and DCD Server for both point-to-point and broadcast bearers;
- DCD envelope mechanism that allows DCD application and content interoperability between DCD Client and DCD Server.

The DCD Enabler consists of the following functional entities:

- **DCD Client (DCDC):** DCD Client resides in the mobile terminal and is used to communicate with the DCD Server. Three different logical functions can be differentiated inside this entity. The Subscription and Administration function (Client component), in charge of handling the exchange of service management information with the DCD Server. The Content Reception and Storage Management function, in charge of handling the content reception from the server. Finally, the Client Application Interaction Function that provides the necessary functions to make possible the interaction between DCD Enabler supported services and registered DCD Enabled Client Applications.
- **DCD Server:** DCD Server implements the application level network functionality for the DCD application. It is responsible for the fulfilment of Subscription and Administration functions in order to handling the exchange of service management information between the DCD Server and DCD Client, and between the DCD Server and the Content Provider, such as when the Content Provider handles subscriptions, as well as for the fulfilment of the Distribution and Adaptation function in order to distribute DCD Content and DCD Content notifications to the DCD Client.

The following entities are out of the scope, but may interact with the DCD Enabler:

- **DCD-Enabled Client Applications:** DCD-Enabled Client Applications are mobile-terminal-based applications, which can interact with the DCD Client in order to enable content delivery to the end user.
- **DCD Content Provider:** The DCD Content Providers interact with the DCD Server in order to serve requests for content, e.g. as any normal web server, providing channel metadata which defines the characteristics of the channels it provides, supporting one or more content publication / delivery methods, or publishing available content to the DCD Server.

6.2.3.1.1 DCD OGSA View (Normative)

Figure 7 below gives a graphical overview of the functional entities of the DCD Enabler and the interfaces, which expose DCD functionality followed by a description in Table 3.

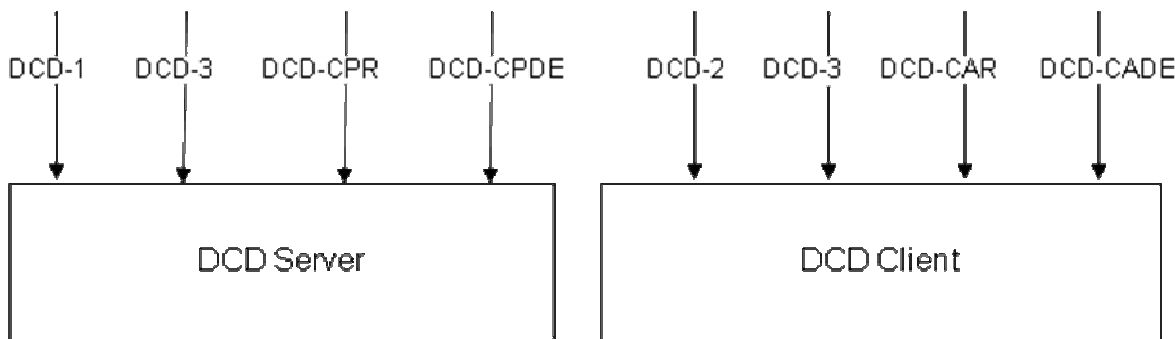


Figure 7: DCD OGSA View

Functional entities	Functionality provided	Via interface	Protocol used
DCD Client (DCDC)	Channel subscription and administration functions <ul style="list-style-type: none"> • DCD Client Activation and session management • DCD-Enabled Client Application registration actions (Register, Deregister) • Service administration actions, e.g. change channel delivery options, suspend / resume channel • Channel Discovery actions • Channel subscription actions (subscribe / unsubscribe, subscription validation for external subscriptions) 	DCD-3	

Functional entities	Functionality provided	Via interface	Protocol used
	<ul style="list-style-type: none"> Automatic request upon notification of content availability at the DCD Server Automatic request for content upon a predefined schedule Automatic request for content upon stored content expiration On-demand request for content retrieval or submission by the DCD-Enabled Client Application, e.g. upon end-user interaction or application-initiated interaction	DCD-2	
	<ul style="list-style-type: none"> Register / deregister of DCD-Enabled Client Application with the DCD Client (dynamically), supplying Application Profile (including the Channel Metadata) to the DCD Enabler Channel subscription actions (subscribe / unsubscribe, subscription validation for external subscriptions with DCD-Enabled Client Application) Note: The mechanism is client platform specific while the data schema for this interface is defined by DCD.	DCD-CAR	
	<ul style="list-style-type: none"> On-demand request for content retrieval or submission by the DCD-Enabled Client Application, e.g. upon end-user interaction or application-initiated interaction Providing content availability notifications and / or content to the DCD-Enabled Client Application Service administration actions, e.g. suspend / resume channel Channel Discovery actions Note: The mechanism is client platform specific while the data schema for this interface is defined by DCD.	DCD-CADE	Client platform specific;
DCD Server	Delivers pushed notifications and / or content to the DCD Client, e.g. <ul style="list-style-type: none"> Notification of content availability for client-invoked retrieval via DCD-1 interface Direct delivery of content 	DCD-1	point-to-point content push interface point-to-multi-point broadcast interface, e.g. HTTP, Cell Broadcast
	Channel subscription and administration functions <ul style="list-style-type: none"> Service administration actions, e.g. change channel delivery options, suspend / resume channel Channel Discovery actions Channel subscription actions (subscribe / unsubscribe, subscription validation for external subscriptions) 	DCD-3	
	Registration of new content channels with the DCD Server Updating of content channels with the DCD Server Exchange subscription related information between the DCD Content Provider and the DCD Server Notification to the DCD Content Provider about subscription events from a DCD Client	DCD-CPR	
	Publishing of content from content Provider at the DCD Server Retrieval of content from the Content Provider	DCD-CPDE	

Table 3: Interfaces exposing DCD functionality

6.3 Service access

The Service access OGSA Suite includes Enablers that facilitate exposing of OMA Enablers functionality in a secure and controlled way.

Such exposure may occur towards other OMA Enablers and applications (third party or otherwise), through the Enabler's IO interface (where present).

6.3.1 Enablers in this OGSA Suite

The Enablers in the Service access OGSA Suite are:

- OMA Web Services [OMA-OWSER_AD]
- OWSER Network Identity [OMA-OWSER_NI_AD]
- Parlay in OSE [OMA-PIOSE_AD]
- Parlay Service Access [OMA-PSA_AD]
- Policy Evaluation, Enforcement & Management [OMA-PEEM_AD]

The following Enablers in early AD development stage belong to this OGSA Suite:

- RESTful bindings for Parlay X Web Services [OMA-REST_ERP]

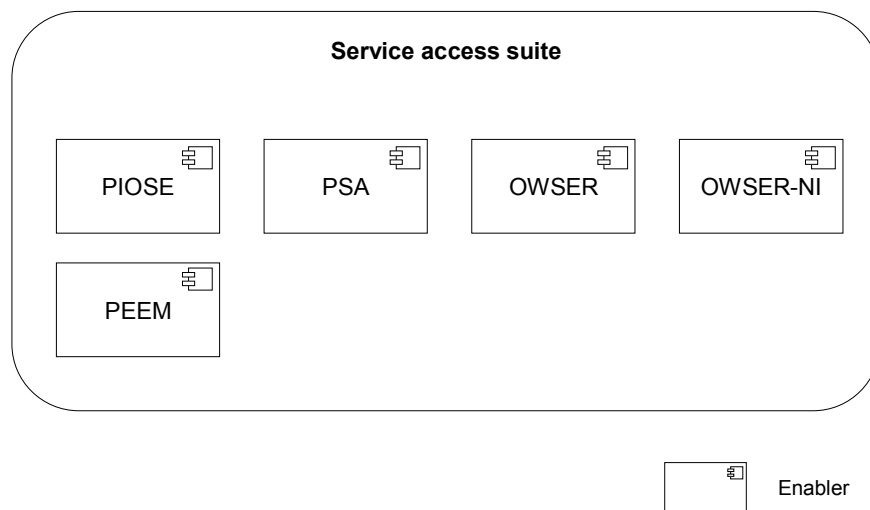


Figure 8: Enablers of the service access OGSA Suite.

6.3.2 Dependencies on other Enablers

The Enablers in this OGSA Suite have dependencies on the following other Enablers, taking into account dependencies explicitly specified in the respective ADs of the Enablers, as well as mappings to data structures defined by the Enablers (e.g. Charging data elements).

- OWSER Network Identity [OMA-OWSER_NI_AD]
- Parlay in OSE [OMA-PSA_AD]

Table 4 depicts how the Enablers of this OGSA Suite are dependent on other Enablers.

Enabler	Relationship with	
	OWSER	PIOSE
OWSER		
OWSER-NI	x	
PEEM		
PIOSE		
PSA		x

Table 4: Dependencies of the Enablers in the service access OGSA Suite on other Enablers

6.3.3 Description of selected Enablers in this OGSA Suite

6.3.3.1 PEEM Enabler V1_0

The OGSA View for PEEM is based on the following specific document [OMA-PEEM_AD].

The PEEM Enabler evaluates and/or enforces policies. Policies are applied to requests to, or responses from resources or, when explicitly called by a resource.

Policies are formalisms that are used to express business, engineering or process criteria represented by a combination of policy conditions and actions.

Note that this Enabler does not specify individual policies, but rather specifies on how to express policies.

PEEM supports two options for expressing policies:

- A ruleset-based option: Each rule is evaluated as separate entity, and the combination of the results of the processing of all the rules in the ruleset determines the policy outcome (notice that a precedence mechanism may be needed). The Policy Expression Language used is the XML Common Policy schema from IETF
- A workflow-based option: The entire policy is processed as a whole, following a flowchart approach, where at each node in the graph, a rule is being processed. The Policy Expression Language used is Web Services Business Process Execution Language (WSBPEL 2.0) from OASIS.

The PEEM Enabler consists of a single functional entity:

- **Policy Evaluation and Enforcement Management (PEEM):** This entity provides the following features:
 - identifies the policies associated with the request.

- processes the policies, i.e. goes through the following steps:
 - evaluates policies using messages received and other context information. The component may delegate to other resources where appropriate
 - executes the policy actions resulting from a positive evaluation of the policy conditions. The component may use delegation to other resources where appropriate, and
 - after completing all previous processing the PEEM Enabler
 - may return, a policy decision to a requestor. The policy processing may complete by returning a policy decision to the requesting resource or perform enforcement itself. When a policy decision is returned to a resource, that resource is in control of deciding how to handle the rendered decision.
 - may allow a request to continue to its original target destination. The policy processing completes by forwarding the original request to the destination resource (if the processing resulted into a “pass” condition) or by returning an error to the originating entity (if the processing resulted into a “fail” condition)
- provides the functions of describing, creating, updating, deleting, provisioning and viewing of policies.

6.3.3.1.1 PEEM OGSA View (Normative)

Figure 9 below gives a graphical overview of the functional entities of the PEEM Enabler and the interfaces, which expose PEEM functionality, followed by a description in Table 5.

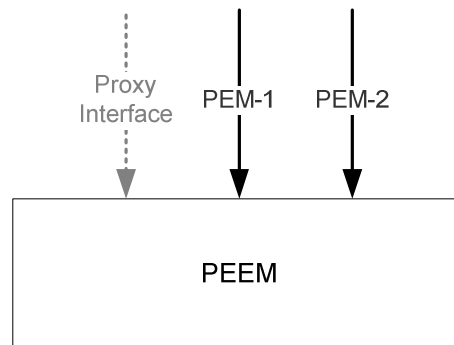


Figure 9: PEEM OGSA View

Functional entities	Functionality provided	Via interface	Protocol used
PEEM	The Proxy interface is used to exchange messages compliant to the target Enablers or more generally messages compliant to combination of the target resource interface and the set of parameters that must be added to requests through that resource's interface, as required to satisfy policies that are to be processed when exposing the resource. The Proxy Interface is not specified by PEEM.	Proxy Interface	Not specified
	The PEM-1 interface is used to make a direct request for policy processing. PEEM processes the request and may return a policy decision (the result of the policy evaluation) to the originating resource, using the same interface. Alternatively, it may also perform policy enforcement and possibly return no value to the requester.	PEM-1	Diameter or SOAP
	The PEM-2 interface is used to make a request for policy management (e.g. creating, updating, deleting, and viewing policies)	PEM-2	XCAP

Table 5: Interfaces exposing PEEM functionality

6.4 Device enabling

The device enabling OGSA Suite consists of the OMA Enablers that provide functions and tools related to UE that may be used in various OGSA Suites for the support of services enabled by that OGSA Suite.

6.4.1 Enablers in this OGSA Suite

The Enablers in the device enabling OGSA Suite are:

- Client Provisioning [OMA-CP_AD]
- Connectivity Management Object [OMA-ConnMO_AD]
- Data Synchronization [OMA-DS-AD]¹³
- Device Capability Management Object [OMA-DCMO_AD]
- Device Management [OMA-DM_AD]
- Device Management Scheduling [OMA-DMSched-AD]
- Device Profiles Evolution [OMA-DPE_AD]
- Diagnostics and Monitoring [OMA-DiagMon_AD]
- Firmware Update Management Object [OMA-FUMO_AD]
- Lock And Wipe Management Object [OMA-LAWMO-AD]
- Smart Card Web Server [OMA-SCWS_AD]
- Software Component Management Object [OMA-SCOMO-AD]
- User Agent Profile [OMA-UAPROF-ERP]

The following Enablers in early AD development stage belong to this OGSA Suite:

- Device Management Smart Card [OMA-DMSC-AD]

¹³ OMA DS is the successor of SyncML, since SyncML was renamed OMA DS in release 1.1.2.

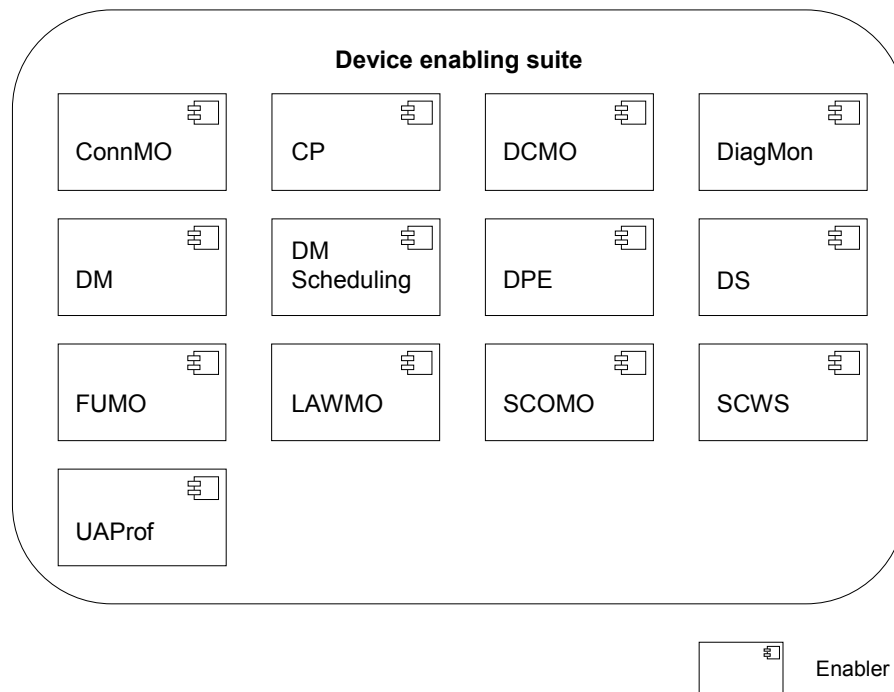


Figure 10: Enablers of the device enabling OGSA Suite

6.4.2 Dependencies on other Enablers

The Enablers in this OGSA Suite have dependencies on the following other Enablers, taking into account dependencies explicitly specified in the respective ADs of the Enablers, as well as mappings to data structures defined by the Enablers (e.g. Charging data elements).

- Application Layer Security Common Functions [OMA-SEC_CF_AD]
- Browsing [OMA-WAP_AD]
- Client Provisioning [OMA-CP_AD]
- Data Synchronisation [OMA-DS-AD]
- Device Management [OMA-DM_AD]
- Device Profiles Evolution [OMA-DPE_AD]
- Download over the air [OMA-DLOTA-AD]
- Email Notification [OMA-EMN_ERP]
- Push [OMA-PUSH-AD]
- Push using SIP [OMA-SIP-PUSH-AD]
- Smart Card Web Server [OMA-SCWS_AD]

Table 6 depicts how the Enablers of this OGSA Suite are dependent on other Enablers.

Enabler	Relationship with										
	Browsing	CP	DLOTA	DM	DPE	DS	EMN	Push	SCWS	SEC_CF	SIPPush
ConnMO				x							
CP											
DCMO				x	x						
DiagMon				x							
DM						x					x
DM Scheduling				x							
DPE		x		x						x	
DS				x			x	x			x
FUMO			x	x							
LAWMO				x							
SCOMO			x	x							
SCWS	x										
UAProf											

Table 6: Dependencies of the Enablers in the device enabling OGSA Suite on other Enablers

6.4.3 Description of selected Enablers in this OGSA Suite

To be provided in a future release.

6.5 Network access

The network access OGSA Suite includes Enablers that provide access to the resources in the networks and their exposed functionality.

6.5.1 Enablers in this OGSA Suite

The Enablers in the network access OGSA Suite are:

- Parlay in OSE [OMA-PIOSE_AD]
- Utilization of IMS capabilities [OMA-IMSinOMA-AD]

Figure 11 below gives a graphical overview of the OMA Enablers belonging to OGSA network access OGSA Suite:

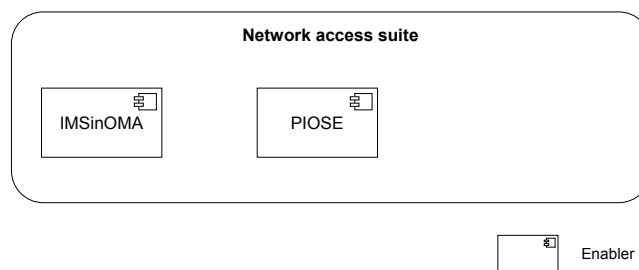


Figure 11: Enablers of the network access OGSA Suite

6.5.2 Dependencies on other Enablers

The Enablers in this OGSA Suite have no relationships to other Enablers.

6.5.3 Description of selected Enablers in this OGSA Suite

To be provided in a future release.

6.6 Supporting Enablers

The supporting Enablers are Enablers that provide functions and tools that may be used in various OGSA Suites for the support of services enabled by that OGSA Suite. These Enablers have different natures and include provisioning of parameters and services, data synchronisation, service platform common architecture, interconnections and some other horizontal activities such as security, privacy or charging etc. Supporting Enablers may be used by the above listed OGSA Suites.

6.6.1 Enablers in this OGSA Suite

The supporting Enablers are:

- Application Layer Security Common Functions [OMA-SEC_CF_AD]
- Categorisation Based Content Screening [OMA-CBCS-AD]
- Charging [OMA-CHRG_AD]
- Client Side Content Screening Framework [OMA-CSCSF_AD]
- Download over the air [OMA-DLOTA-AD]
- Email notification [OMA-EMN_ERP]
- External Functionality Interface [OMA-EFI_ERP]
- General Service Subscription Management [OMA-GSSM-AD]
- Global Permissions Management [OMA-GPM-AD]
- Location in SIP/IP Core [OMA-LOCSIP-AD]
- Look and Feel Customisation [OMA-LFC-AD]
- Mobile Location Protocol [OMA-MLP-TS]
- Mobile Location Services [OMA-MLS-AD]
- OMA Domain Name System [OMA-WPDNS-ERP]
- Online Certificate Status Protocol [OMA-OCSPMP-ERP]
- On-Board Key Generation and Key Enrolment [OMA-OBKG-ERP]
- Presence SIMPLE [OMA-Presence-AD]
- Push [OMA-PUSH-AD]
- Secure Content Identification Mechanism [OMA-SCIM-AD]
- Secure User Plane Location [OMA-SUPL-AD]
- SIP Push [OMA-SIP-PUSH-AD]
- Standard Transcoding Interface [OMA-STI-AD]
- URI Schemes for the Mobile Applications Environment [OMA-URI-Schemes-ERP]
- vObject [OMA-vObject-ERP]
- XML Document Management [OMA-XDM_AD]
- Wireless Public Key Infrastructure [OMA-WPKI_ERP]

The following Enablers in early AD development stage belong to this OGSA Suite:

- Condition-based URIs selection [OMA-CBUS_AD]
- Content Management Interface [OMA-CMI_AD]
- Converged Address Book [OMA-CAB-AD]
- Push (next version 2.3) [OMA-PUSH-AD_next]
- XML Data Management (next version 2.1) [OMA-XDM_AD_next]

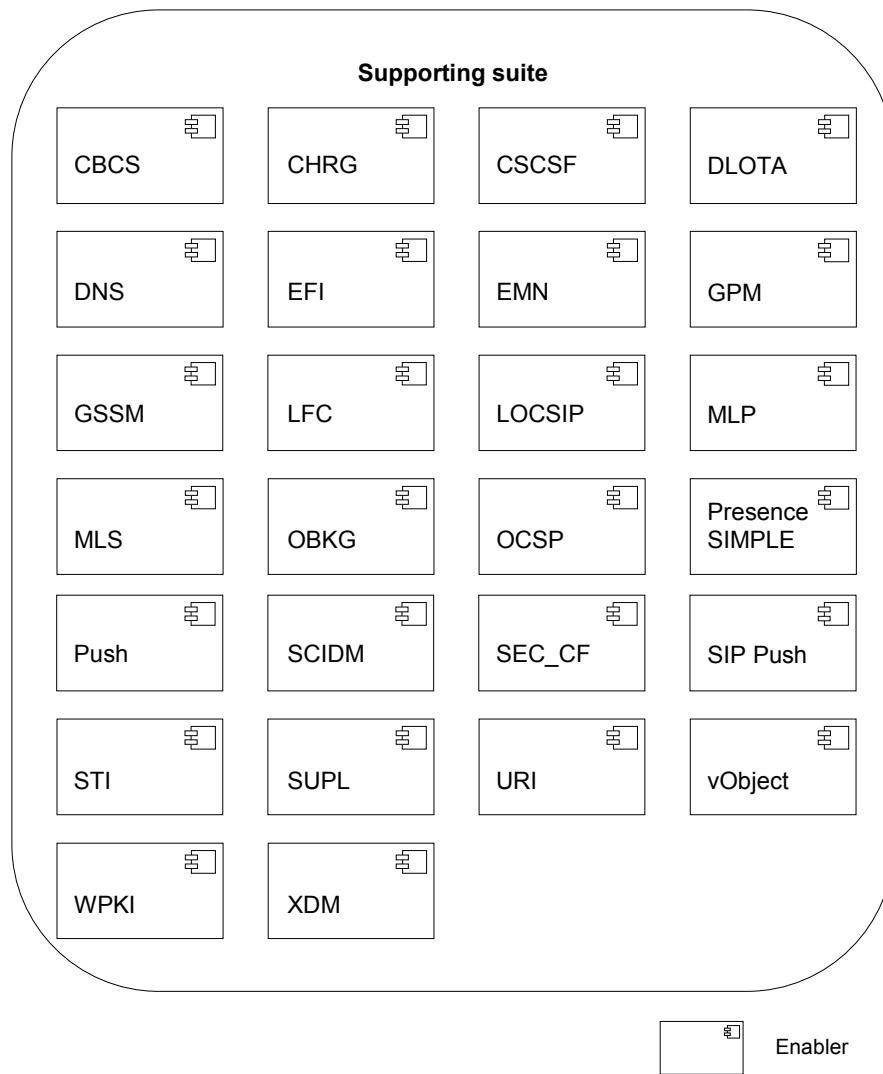


Figure 12: Enablers of the supporting OGSA Suite

6.6.2 Dependencies on other Enablers

The Enablers in this OGSA Suite have dependencies on the following other Enablers, taking into account dependencies explicitly specified in the respective ADs of the Enablers, as well as mappings to data structures defined by the Enablers (e.g. Charging data elements).

- Application Layer Security Common Functions [OMA-SEC_CF_AD]
- Browser Protocol Stack [OMA-BPS_ERP]¹⁴
- Browsing [OMA-WAP_AD]
- Charging [OMA-CHRG_AD]
- Device Management [OMA-DM_AD]
- Download over the air [OMA-DLOTA-AD]
- Global Permissions Management [OMA-GPM-AD]
- Mobile Location Services [OMA-MLS-AD]
- OMA Web Services [OMA-OWSER_AD]
- Policy Evaluation, Enforcement & Management [OMA-PEEM_AD]
- Push [OMA-PUSH-AD]
- Push using SIP [OMA-SIP-PUSH-AD]
- User Agent Profile [OMA-UAPROF-ERP]
- Utilization of IMS capabilities [OMA-IMSinOMA-AD]
- XML Document Management [OMA-XDM_AD]

Table 2 depicts how the Enablers of this OGSA Suite are dependent on other Enablers.

¹⁴ The AD of Browser_Protocol_Stack-V2_1 references the WAP Arch (see OMA-ERELD-Browser_Protocol_Stack-V2_1)

Enabler	Relationship with														
	Browsing	Browser Prot Stack	CHRG	DLOTA	DM	GPM	IMSinOMA	MLS	OWSER	PEEM	Push	SEC_CF	SIPPush	UAPProf	XDM
CBCS										x					
CHRG															
CSCSF															
DLOTA															
DNS															
EFI															
EMN															
GPM										x					
GSSM										x					
LFC				x	x										
LOCSIP						x	x								x
MLP															
MLS															
OBKG															
OCSP															
Presence SIMPLE					x		x								x
Push (V2.2)	x	x										x	x		
SCIDM											x				
SEC_CF															
SIP Push							x							x	
STI			x					x							
SUPL								x			x		x		
URI															
vOBJECT IOP Profile															
WPKI															
XDM (V2.0)			x		x		x								

Table 7: Dependencies of the Enablers in the supporting OGSA Suite on other Enablers

6.6.3 Description of selected Enablers in this OGSA Suite

6.6.3.1 XDM Enabler V2_0

The OGSA View for XDM is based on the following specific document [OMA-XDM_AD].

The XDM Enabler defines a common mechanism to make user-specific, service-related information accessible to other service Enablers. XDM specifies how such information is defined in well-structured XML document, how these documents are accessed and manipulated and how consumers of the documents are notified of changes made to the documents.

The XDM Enabler includes the following features:

- A common protocol, XML Configuration Access Protocol (XCAP), by which Principals can access and manipulate service-related data stored as XML documents.
- A mechanism, SIP subscription/notification, by which Principals can be notified of changes to such documents
- A mechanism, limited XQuery, by which Principals can search service-related data stored as XML documents.

The XDM Enabler consists of the following functional entities

- **XDM Client (XDMC):** The XDMC accesses various XDMS features as described in [OMA-XDM_AD].
 - Trusted XDMC: An XDMC that uses XDM interfaces that do not require security mechanisms, typically deployed within Trusted Networks.

- Untrusted XDMC: An XDMC that uses XDM interfaces that require security mechanisms such as authentication, typically deployed outside of Trusted Networks.
- **Aggregation Proxy:** The Aggregation Proxy is the single contact point for Untrusted XDMCs to access XML documents stored in any XDMS.
- **Search Proxy:** This entity manages search requests from the XDMC to XML documents stored in any XDMS.
- **Subscription Proxy:** The Subscription Proxy is a server entity that receives subscriptions for notification of changes in XML documents stored in any XDMS
- **XDMSs:** This entity is a logical repository that manages XML documents
- **Cross-Network Proxy:** The entity is the single contact point for the XDM Enablers located in different networks to communicate over trusted connection.

6.6.3.1.1 XDM OGSA View (Normative)

Figure 13 below gives a graphical overview of the functional entities of the XDM Enabler and the interfaces, which expose XDM, followed by a description in Table 8.

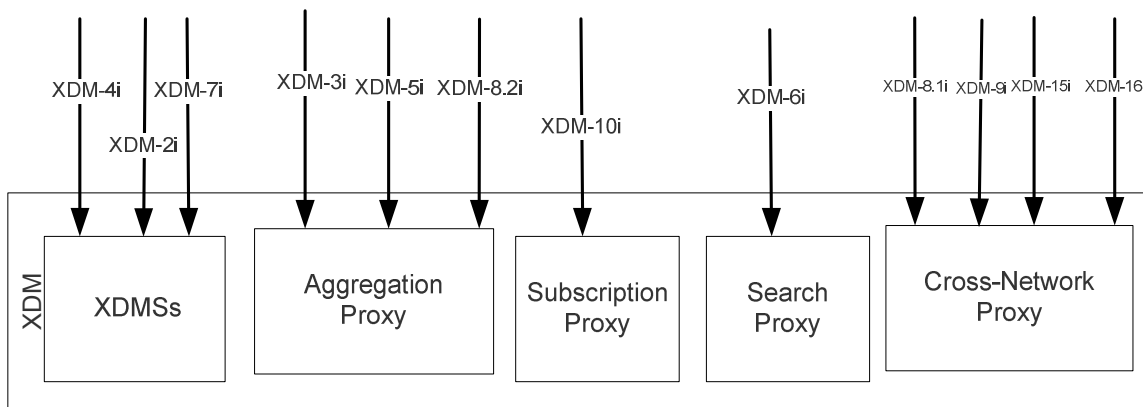


Figure 13: XDM OGSA View

Functional entities	Functionality provided	Via interface	Protocol used
Aggregation Proxy	XML document management (e.g. create, modify, retrieve, delete) by routing the requests to the correct XDMS or Aggregation Proxy of Remote Network;	XDM-3i	XCAP
	Mutual authentication (between Untrusted XDMC and Aggregation Proxy);		
	Optional compression/decompression.		
Search Proxy	Searching information from XML documents stored in any XDMS by routing the requests to the Search Proxy;	XDM-5i	Limited XQuery over HTTP
	Mutual authentication (between Untrusted XDMC and Aggregation Proxy);		
Cross-Network Proxy	Optional compression/decompression		
	“Enabler-specific” (acting as Trusted XDMC) XML document management (e.g. create, modify, retrieve, delete) in a remote network by routing the requests to Aggregation Proxy of Remote Network	XDM-8.2i	XCAP

Functional entities	Functionality provided	Via interface	Protocol used
Subscription Proxy	Subscription to / notification of the modification of XML documents handled by multiple XDMSs	XDM-10i	SIP
Search Proxy	Searching information from XML documents stored in any XDMS	XDM-6i	Limited XQuery over HTTP
XDMSs	XML document management (e.g. create, modify, retrieve, delete) handled by a particular Shared XDMS	XDM-4i	XCAP
	Subscription to / notification of the modification of XML documents handled by a particular XDMS	XDM-2i	SIP
	Searching information from XML	XDM-7i	Limited XQuery over HTTP
Cross-Network Proxy	Forwarding of requests to the Cross-Network Proxy for XML document management of XML documents (e.g. create, modify, retrieve, delete) handled by any XDMS in remote networks;	XDM-8.1i	XCAP
	Receiving responses from the Cross-Network Proxy for XML document management of XML documents (e.g. create, modify, retrieve, delete) handled by any XDMS in remote networks.		
	Forwarding of search requests to the Cross-Network Proxy for searches in remote domains;	XDM-9i	Limited XQuery over HTTP
	Receiving search responses from the Cross-Network Proxy for searches in remote domains.		
Cross-Network Proxy	Forwarding of requests to the Cross-Network Proxy for XML document management of XML documents (e.g. create, modify, retrieve, delete) handled by any XDMS residing in the same domain as the Cross-Network Proxy;	XDM-15i	XCAP
	Receiving responses from the Cross-Network Proxies for XML document management of XML documents (e.g. create, modify, retrieve, delete) handled by any XDMS residing in the same domain as the Cross-Network Proxy.		
Cross-Network Proxy	Forwarding of search requests to the Cross-Network Proxy for searching information from XML documents stored in any XDMS residing in the same domain as the Cross-Network Proxy;	XDM-16i	Limited XQuery over HTTP
	Receiving search responses from the Cross-Network Proxy for the search requests.		

Table 8: Interfaces exposing XDM functionality

6.6.3.2 Charging Enabler V1_1

The OGSA View for Charging is based on the following specific document [OMA-CHRG_AD].

The Charging Enabler enables charging for various types of Chargeable Events to a subscriber's account, possibly maintained by an underlying Charging Infrastructure. It is not a Charging Infrastructure in its own right but a facilitator in the process of providing charging at the application and OMA Enabler level. It builds on existing charging architectures which have already defined models for charging.

It specifies charging interfaces CH-1 (Offline Charging) and CH-2 (Online Charging) with a high-level protocol-independent description and with detailed protocol bindings to Diameter and Web Services .

The Charging Enabler includes the following features:

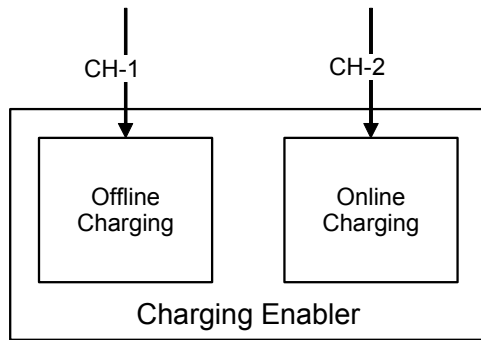
- Time and/or Volume and Subscription based
- Online and Offline charging methods (i.e. prepay and postpay payment methods),
- Mechanism for 'A' party pays
- Third-Party-Pays (TPP) capability
- Operations for refunding or depositing units to the end-user's account
- Capabilities for cost splitting of group services
- Quota Management.
- Correlation/Aggregation
- Rating
- Account Balance Management
- Event and Session Based Charging

The Charging Enabler consists of the following functional entities

- **Charging Enabler:** This entity receives charging requests via either the offline or online charging interface or both.
 - Offline charging is a process where charging information for resource usage is generated concurrently with usage of that resource. The charging information generated for offline charging does not have a real time effect on the service rendered nor does it affect service control.
 - Online charging is a charging process where charging information can affect in real time the service rendered and therefore directly interacts with the session/service control.
- **Charging Enabler User:** This entity generates Charging Events as the result of a user consuming a service and invokes and interacts with the Charging Enabler.

6.6.3.2.1 Charging OGSA View (Normative)

Figure 14 below gives a graphical overview of the functional entities of the Charging Enabler and the interfaces, which expose Charging functionality followed by a description in Table 9. Please, note that the Charging Enabler User is not shown in this figure.



CH1: Diameter Accounting or Parlay X Web Services Payment API

CH2: Diameter Credit Control or Parlay X Web Services Payment API

Figure 14: Charging OGSA View

Functional entities	Functionality provided	Via interface	Protocol used
Offline Charging	<p>CH-1 is used for offline Charging Event reporting. This interface supports the following functions:</p> <ul style="list-style-type: none"> • The sending of Charging Events after service delivery • The sending of interim Charging Events during service delivery • Charging Correlation <p>This interface is exposed by the charging Enabler to any authorized Offline Charging requestor (authorized Charging Enabler User)</p>	CH-1	<p>Diameter Accounting,</p> <p>Parlay X Web Services Payment API (only event based charging)</p>
Online Charging	<p>CH-2 is used for online charging. This interface supports the following functions:</p> <ul style="list-style-type: none"> • Quota requests • Renewed quota requests • Reporting of portion of unused quota • Rating • Credit checking • Correlation • Refunding facility. <p>This interface is exposed by the charging Enabler to any authorized Online Charging requestor (authorized Charging Enabler User)</p>	CH-2	<p>Diameter Credit Control,</p> <p>Parlay X Web Services Payment API</p>

Table 9: Interfaces exposing Charging functionality

6.6.3.3 CBCS Enabler V1_0

The OGSA View for CBCS is based on the following specific document [OMA-CBCS-AD].

The CBCS Enabler screens Content before delivering it to the user, based on Content Categories. The CBCS Enabler can be applied to any Content regardless of the Enabler or protocol that is used to deliver the Content.

A Content Category qualifies the Content according to a categorization scheme. The CBCS Enabler can obtain the Content Category for a given piece of Content from a Categorization Entity, from categorization meta-data in the Content itself, or by analyzing the Content.

The CBCS Enabler consists of two independent functional entities:

Content Categorization Component:

This entity provides following features:

- Maps Content or Content References to a set of categories
- Management of Content Categorization Rules
- Management of associations between Content References and Content Categories

Content Screening Component:

This entity provides following features:

- Identifies the Screening Rules associated with the incoming request for screening
- Identifies of the submitted Content and any other parameters
- Processes the Screening Rules to determine whether the Content should be categorized, modified in any way and delivered.
- Management of Screening Rules

The standardization of Content categorization schemes, Content Categories, CBCS User Profiles, Screening Rules and other Content related information, is outside the scope of the CBCS Enabler specification.

6.6.3.3.1 CBCS OGSA View (Normative)

Figure 13 below gives a graphical overview of the functional entities of the CBCS Enabler and the interfaces, which expose CBCS functionality, followed by a description in Table 10.

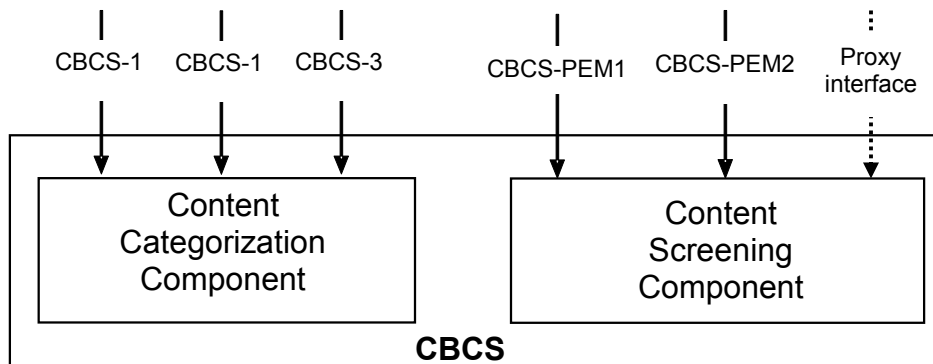


Figure 15: CBCS OGSA View

Functional entities	Functionality provided	Via interface	Protocol used
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Functional entities	Functionality provided	Via interface	Protocol used
Content Screening Component	While CBCS can be deployed in proxy pattern, a proxy interface is not specified by CBCS; this is because specifying such an interface depends on the protocols being proxied (e.g. Browsing, HTTP, Messaging, etc), which is out of scope for CBCS.	Proxy Interface	Not specified
	<p>The CBCS interface to invoke the processing of Screening Rules is derived from CBCS.PEM-1. It is used to perform Content Screening in the callable usage pattern.</p> <p>Input parameters in the request may include:</p> <ul style="list-style-type: none"> • Identification of the target principal for Content, • Content or a Content reference (e.g., URI), • Other information (e.g., Content metadata and categorization information) • Content source (e.g. URI) and associated information <p>Output parameters in the response may include:</p> <ul style="list-style-type: none"> • The decision resulting from the processing of the screening rules • Additional explanatory information related to the decision 	CBCS.PEM-1	Diameter or SOAP
	The CBCS management interface is derived from CBCS.PEM-2. It is used to create, delete, modify and view Screening Rules.	CBCS.PEM-2	XCAP
Content Categorization Component	<p>Using this interface a Resource may obtain the Content Category (or Categories) for given Content.</p> <p>Input parameters in the request may include:</p> <ul style="list-style-type: none"> • the Content itself or a Content reference (e.g. URI) • Content related information (e.g. Content metadata and categorization information) • Content source (e.g. URI) and associated information. • A request identifier. <p>Output parameters in the response may include:</p> <ul style="list-style-type: none"> • A set of Content Categories (i.e. zero or more) • Metadata associated with the Content Categories • The request identifier of the request to which this is the response. 	CBCS-1	ICAP
	The CBCS-2 interface is used to create, delete, modify and view Content Categorization Rules.	CBCS-2	XCAP
	The CBCS-3 interface is used to associate (create, delete, modify and view) Content references (e.g., URIs or the Content itself) with Content Categories.	CBCS-3	ICAP

Table 10: Interfaces exposing CBCS functionality

Appendix A. Change History

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 1.0 History

Document Identifier	Date	Sections	Description
Draft Versions OMA-OD-OGSA-V1_0	04 Dec 2009		First draft moving the current agreed OGSA content from WP to OD
Candidate Version : OMA-OD - OGSA -V1_0	26 Jan 2010	All	Status changed to Candidate by TP OMA-TP-2010-0005R01-INP_OGSA_V1_0_RRP_for_Candidate_Approva Editorial fixes: 2010 template

Appendix B. Enablers not included in this release

OGSA Suites only include current, normative OMA Enabler Releases. For this reason, White Papers, Historic Enabler Releases, Data Schemas and Releases that contain only Requirements for which neither Architecture nor Technical Specification exists are not included in OGSA Suites.

The following releases have not been included in OGSA Suites as they fall in one of the categories above:

- Games Services [OMA-GS_AD] (Historic Release)
- Charging Data [OMA-CHRG_Data] (Data Schema)
- Charging Worksplit Whitepaper [OMA-CHWS] (White Paper)
- Identity Management Framework [OMA-IdM_RD] (Requirements Only)
- IMPS V1.3 Implementation Guidelines [OMA-IMPS_WP] (White Paper)
- In-Game Communications [OMA-IGC_RD] (Requirements Only)
- Location [OMA-LOC_RD] (Requirements Only)
- Messaging Services Interworking [OMA-MSI_WP] (White Paper)
- Mobile Domain SMIL [OMA-SMIL_RD] (Requirements Only)
- Mobile Gaming Evolution [OMA-MGE_WP] (White Paper)
- OMA Data Objects [OMA-DO_WP] (White Paper)
- OMA Service Environment [OMA-OSE] (Reference Release that provides an architectural framework for all OMA Enablers, but does not constitute a particular Enabler architecture)
- Open Service Provider Environment [OMA-OSPE_AD] (Reference Release)
- Privacy Requirements for Mobile Services [OMA-PRIV_RD] (Requirements Only)
- WAP Billing Framework [OMA-WAP-BF] (Historic Release)
- White Paper on Provisioning Objects [OMA-AC_MO_WP] (White Paper)
- WAP Proxy-Based Redirect [OMA-WPBR_RD] (Requirements Only)