Utilization of IMS capabilities Requirements

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Open Mobile Alliance

OMA-RD-IMSinOMA-V1_0-20050204-C

Contents

1. Scope (Informative)

The scope of the IMS WI is to show, for OMA enablers realised on IMS, how they should use IMS and how they should interface with IMS in a consistent way, whilst not breaking the principle of interoperability and/or interworking with both other (IMS realized or not) enablers and non-IMS networks.

The information contained in this RD is applicable for OMA working groups that are developing service enablers that might be realized using IMS capabilities, since it is targeted to implementers of such enablers.

This RD contains system level requirements to ensure interoperability between OMA service enabler realizations and an underlying IP Multimedia Subsystem (as specified by 3GPP/3GPP2).

The requirements on specific OMA service enablers are not affected by this RD and are handled by the individual OMA working groups as usual.

The requirements provided in this RD are oriented towards the recommendations given in the “Technical report on the usage of 3GPP/3GPP2 IMS in OMA” [TR_IMSinOMA].

2. References

2.1 Normative References

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

[POC RD] "Push to Talk over Cellular Requirements Version 1.0" OMA-RD-PoC-V1_0
URL :http://www.openmobileaaliance.org

[POC AD] "Push to Talk over Cellular Requirements Version 1.0"OMA-AD-PoC-V1_0
URL :http://www.openmobileaaliance.org

[PAG RD] "Presence Requirements Version 1.0 OMA-RD-PAG-V1_0
URL :http://www.openmobileaaliance.org"

[PAG AD] "Stage 2 - Presence using SIMPLE Draft Version 1.0" OMA-AD-PAG-V1_0
URL:http://www.openmobileaaliance.org

[IM RD] "Instant Messaging Requirements" OMA-RD-IM-V1_0
URL :http://www.openmobileaaliance.org

[IM AD] "Instant Messaging using SIMPLE-Architecture" OMA-AD-IM_SIMPLE-V1_0
URL :http://www.openmobileaaliance.org

2.2 Informative References

[TR_IMSinOMA] "IP MM BoF technical report" OMA-TR_IMSinOMA V1_0
URL :http://www.openmobileaaliance.org

[3GPP TS 22.141] 3GPP TS 22.141, Presence service; Stage 1
URL: http://www.3gpp.org/ftp/Specs/

[3GPP TS 22.228] 3GPP TS 22.228, Service requirements for the IP Multimedia Core Network Subsystem; Stage 1
URL: http://www.3gpp.org/ftp/Specs/

[3GPP TS 22.250] 3GPP TS 22.250, IP Multimedia Subsystem (IMS) Group Management; Stage 1
URL: http://www.3gpp.org/ftp/Specs/

[3GPP TS 22.340] 3GPP TS 22.340, IP Multimedia Subsystem (IMS) messaging; Stage 1
URL: http://www.3gpp.org/ftp/Specs/

[3GPP TS 23.002] 3GPP TS 23.002, Network Architecture
URL: http://www.3gpp.org/ftp/Specs/

[3GPP TS 23.141] 3GPP TS 23.141, Presence service; Architecture and functional description; Stage 2
URL: http://www.3gpp.org/ftp/Specs/

[3GPP TS 23.228] 3GPP TS 23.228, IP Multimedia Subsystem (IMS); Stage 2
URL: http://www.3gpp.org/ftp/Specs/

[3GPP TS 24.229] 3GPP TS 24.229, IP Multimedia Call Control Protocol based on SIP and SDP; Stage 3
URL: http://www.3gpp.org/ftp/Specs/

[3GPP TS 32.200] Telecommunication management; Charging management; Charging principles
URL: http://www.3gpp.org/ftp/Specs/

[3GPP TS 32.225] Telecommunication management; Charging management; Charging data description for the IP Multimedia Subsystem (IMS)
URL: http://www.3gpp.org/ftp/Specs/

[3GPP2 S.R0037-0]	IP Network Architecture Model for cdma2000® Spread Spectrum Systems URL: http://www.3gpp2.org/Public_html/specs/
[3GPP2 S.R0058]	3GPP2 TSG-S S.R0058, IP Multimedia Domain System Requirements; Stage-1 URL: http://www.3gpp2.org/Public_html/specs/
[3GPP2 X.P0013.0]	Multi-Media Domain Overview URL: http://www.3gpp2.org/Public_html/specs/
[3GPP2 X.P0013.10]	IP Multimedia Subsystem (IMS) Sh Interface signaling flows and message contents URL: http://www.3gpp2.org/Public_html/specs/
[3GPP2 X.P0013.11]	Sh interface based on the Diameter protocol URL: http://www.3gpp2.org/Public_html/specs/
[3GPP2 X.P0013.2]	IP Multimedia Subsystem (IMS); Stage-2 URL: http://www.3gpp2.org/Public_html/specs/
[3GPP2 X.P0013.3]	IP Multimedia (IM) session handling; IM call model URL: http://www.3gpp2.org/Public_html/specs/
[3GPP2 X.P0013.4]	IP Multimedia Call Control Protocol based on SIP & SDP; Stage-3 URL: http://www.3gpp2.org/Public_html/specs/
[3GPP2 X.P0013.5]	IP Multimedia (IM) Subsystem Cx Interface; Signaling flows and message contents URL: http://www.3gpp2.org/Public_html/specs/
[3GPP2 X.P0013.6]	Cx Interface based on the Diameter protocol; Protocol details URL: http://www.3gpp2.org/Public_html/specs/
[3GPP2 X.P0013.7]	IP Multimedia Subsystem Charging Architecture and Stage-2 Description URL: http://www.3gpp2.org/Public_html/specs/
[3GPP2 X.P0013.8]	Telecommunications management; Accounting; Accounting data description for the IMS domain URL: http://www.3gpp2.org/Public_html/specs/
[TIA-835]	"TIA/IS-835, Release C; CDMA2000 Wireless IP Network Standard" URL: http://www.tiaonline.org/standards/
[OSE]	"OMA Service Environment" OMA-SERVICE_ENVIRONMENT-V1_0 URL :http://www.openmobileaaliance.org
[TIA-41]	"TIA/IS-41, Revision D, Cellular Radiotelecommunications Intersystem Operations" URL: http://www.tiaonline.org/standards/

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.

IMS versus MMD: The term IMS is used to refer not only to its 3GPP usage, but also to its 3GPP2 meaning as a subsystem of the Multimedia Domain (MMD). 3GPP2 MMD is more than 3GPP IMS. MMD is also the IP transport (layer 3 defined in [IS-835]) and will at some time include the mobility and access authentication/authorization that is currently done by [TIA-41]. However, for the purpose of this document, we will use the acronym “IMS” to refer to both the 3GPP IMS subsystem and the IMS piece of 3GPP2 MMD.

3.2 Definitions

None

3.3 Abbreviations

AS	Application Server
GW	Gateway
HSS	Home Subscriber Server
IMS	IP Multimedia Subsystem
ISC	IP multimedia Subsystem service Control Interface
ISIM	IMS Subscriber Identity Module
MMD	Multimedia Domain
OSA	Open Service Access
OSE	OMA Service Environment
PoC	Push to talk over Cellular
QoS	Quality of Service
S-CSCF	Serving Call Session Control Function
SIMPLE	SIP for Instant Messaging and Presence Leveraging
SIP	Session Initiation Protocol
UE	User Equipment
USIM	Universal Subscriber Identity Module
3GPP	3rd Generation Partnership Project
3GPP2	3rd Generation Partnership Project 2

4. Introduction (Informative)

The IP Multimedia Subsystem (IMS) has been developed based on the wide-spread technical know-how of the cellular industry to enable the realization of real-time and non real-time multimedia services in a mobile environment. IMS provides a SIP based architecture that addresses the needs of mobile operators in terms of session management, security, mobility, QoS and charging. At the moment there are no other globally standardised SIP architectures.

OMA's use case and market requirement driven approach complements the standardisation achievements of 3GPP and 3GPP2 on IMS with additional market input. As the main industry body for the development of mobile service enabler specifications, OMA has the potential to define service enablers that leverage these IMS capabilities in an interoperable and consistent way.

It is important to note that OMA and the mobile industry in general gain advantage from the exploitation of the existing IMS capabilities. Among these benefits are:

- The realization of OMA enablers that use IMS is facilitated and accelerated.
- Continuity of the specification process from 3GPP/3GPP2 exploiting the already defined IMS architecture and focusing on service enabler specifications.
- Duplication of work between OMA and 3GPP/3GPP2 can be avoided and the same IMS architecture can be adopted.
- Improved communication and information sharing between OMA and 3GPP/3GPP2 when the IMS terms, definitions and concepts are the same.
- Maximised reuse of IMS capabilities and network mechanisms to protect the investments and efforts of the cellular industry and reduction of additional costs by leveraging current investments into IMS

The requirements provided in this RD aim to ensure the consistent and interoperable use of the IMS architecture by OMA service enablers.

5. Use Cases (Informative)

This specification provides requirements primarily to ensure interoperability between OMA service enabler realizations and an underlying IP Multimedia Subsystem. The RD does not reflect specific user requirements but it affects the user experience of IMS subscribers using OMA service enabler based services.

OMA are already developing several service enablers that use IMS functions and reference points, i.e. PoC, PAG and IM. The Use Cases for these service enablers applicable for IMS interoperation are described in the following specifications:

- "Push to Talk over Cellular Requirements", ref. [POC RD]
- OMA-RD-PAG-V1_0-20031111-D, ref. [PAG RD]
- OMA-RD-IM-V1_0-20040123, ref. [IM RD]

The basic use cases that are relevant for the interoperability with IMS are described in the following 3GPP specifications:

- 3GPP TS 22.228, Service requirements for the IP Multimedia Core Network Subsystem; Stage 1, ref. [3GPP TS 22.228]
- 3GPP TS 23.228, IP Multimedia Subsystem (IMS); Stage 2, ref. [3GPP TS 23.228
- TS 22.141, Presence service; Stage 1, ref. [3GPP TS 22.141]
- 3GPP TS 22.250, IP Multimedia Subsystem (IMS) Group Management; Stage 1, ref. [3GPP TS 22.250]
- 3GPP TS 22.340, IP Multimedia Subsystem (IMS) messaging; Stage 1, ref. [3GPP TS 22.340]
- Telecommunication management; Charging management; Charging principles, ref. [3GPP TS 32.200]

Basic use cases are also described in the 3GPP2 specification:

- 3GPP2 MMD Stage-1 [3GPP2 S.R0058]
- Multi-Media Domain Overview, ref. [3GPP2 X.P0013.0]

The IMS linked OMA service enablers and 3GPP/3GPP2 features listed above describe the applicable use cases for IMS.

A general use case is also provided to describe the perspective from which the requirements are derived.

5.1 General Use Case

5.1.1 Short Description

This use case describes how a Service Provider can develop a service using OMA specified service enablers that are connected to IMS and use IMS capabilities in an interoperable way.

5.1.2 Actors

A Service Provider, who provides mobile services to his users.

5.1.2.1 Actor Specific Issues

In the development of new services, the Service Provider wants to protect his investment in the IMS platform already deployed in his network. The Service Provider also wants to leverage the capabilities like security and QoS that his IMS platform provides for the mobile environment.

5.1.2.2 Actor Specific Benefits

The Service Provider benefits from all the capabilities provided by the IMS network architecture in a way optimised for the mobile case, like

- User accessibility (detection of unreachable user and indications to requesting entities)
- Session management (control mechanisms for session re-direction)
- Bearer control (detect and recover from the loss of radio bearer)
- A defined relationship between the responsibilities of the home network and the responsibilities of the visited network when a user is roaming.
- A charging mechanism based on content, rather than solely byte counts, and which allows the visited and home networks for roaming users to agree on the charges due to each other.
- A security architecture
  - allowing authentication of the user before they are allowed to use network capabilities
  - between network elements – this architecture provides the security elements, and also the basis for a trust domain which is used by certain SIP extensions; one of these extensions provides for calling/connected line identification, for which the mechanism without using trusted domains is not yet available in IETF.
- A mechanism for policy control by the network operator, such that the network only handles traffic that the user has contracted for.
- A mechanism to ensure the efficient usage of the radio interface.

The Service Provider benefits also from enablers provided by the IMS, like Presence.

The Service Provider may also use a third party to buy an off-the-shelf service that interfaces with his OMA enablers in a standard way.

The Service Provider can upgrade his IMS without having to modify his OMA enablers or Applications.

5.1.3 Pre-conditions

The Service Provider already has an IMS implemented in his network; this IMS includes capabilities like Presence.

The Service Provider also has some OMA enablers implemented in his network, like OMA PoC and Charging enablers, but does not have an OMA Presence enabler.

5.1.4 Post-conditions

None.

5.1.5 Normal Flow

1. The Service Provider develops a new service (e.g. PoC).
2. This service is developed using an OMA enabler (e.g. PoC).
3. This service uses Presence capabilities provided by the IMS, by interfacing with IMS Presence via the ISC reference point.
4. This service uses security and charging IMS capabilities that interface with the service level OMA Security and Charging via interfaces defined in OMA.
5. This service uses the network capabilities provided by the IMS, via interfaces defined either in 3GPP/3GPP2 or OMA.

5.1.6 Alternative Flow

1. The Service Provider buys an OMA compliant off-the-shelf service (e.g. PoC) from a third party.
2. This third party service interfaces with the OMA enablers and IMS components in a standard way
3. The rest is the same as in the normal flow.

5.1.7 Operational and Quality of Experience Requirements

None.

5.2 Open Issues

None.

6. Requirements (Normative)

In cases where OMA enablers are realized using 3GPP/3GPP2 IMS they shall use it as specified by OMA.

6.1 High-Level Functional Requirements

This section contains the high level requirements for the utilization of IMS capabilities by OMA service enabler realizations.

A consistent use of the IMS architecture and homogeneous access to its capabilities SHALL be assured by

- Defining the functional split between OMA functional entities and IMS functional entities
- Determining the reference points between OMA service enabler realizations and the IMS including the corresponding protocols to be used

6.1.1 Security

The IMS assures that the SIP endpoint has been authenticated and authorized during the registration phase at IMS level. The security mechanisms of IMS offer secured connections to deliver SIP signalling messages to an end user. It SHALL be possible for OMA service enabler realizations to use the security and authentication mechanisms of the IMS.

6.1.2 Charging

The charging capabilities can be considered as non-essential to service enabler realizations but they do provide additional value by linking service enabler realizations to business logic infrastructure. Examples of such linkage are charging correlations, prepaid and postpaid charging. The charging mechanisms of the IMS SHALL be trusted and used by the IMS related service enabler realizations.

6.1.3 Administration and configuration

None.

6.1.4 Usability

None.

6.1.5 Interoperability

Interoperability between OMA service enabler realizations and an underlying IMS SHALL be ensured by standardizing the IMS related service enabler realizations in such a way that they can

- Interface with the IMS
- Use IMS capabilities and
- Exploit the resources of their underlying network infrastructure via the IMS.

The principle of interoperability and/or interworking with both other (IMS realized or not) enablers and non-IMS networks SHALL NOT be broken.

6.1.6 Privacy

The IMS assures that the user maintains privacy if so desired. The privacy mechanisms of the IMS SHALL be trusted and used by the IMS related service enabler realizations.

6.1.7 Identity

It SHALL be possible for the IMS related service enabler realizations to use the user identities defined for IMS.

6.1.8 Interoperator Interconnect, Charging and Accounting

It SHALL be possible for the IMS related service enabler realizations to use Interoperator Interconnect, Charging and Accounting methods defined for IMS.

6.2 Overall System Requirements

The IMS, developed by 3GPP/3GPP2, allows applications, i.e. commercial services, to access capabilities of the IMS. It comprises options for providing services, namely SIP-Application Server and OSA.

OMA's service enabler realizations SHALL treat the IMS as a network capability providing both IP transport and other functions as described in the sections below.

OMA's service enabler realizations SHALL be able to interface to the IMS, use IMS capabilities and exploit the resources of their underlying network infrastructure via the IMS.

6.3 System Elements and IMS capabilities

6.3.1 Relevant Interfaces to IMS

OMA enabler realizations using IMS capabilities SHALL use selected IMS interfaces standardized by 3GPP/3GPP2, as defined by OMA.

6.3.2 IMS Service Capabilities

OMA service enabler realizations using IMS SHALL use selected IMS service capabilities as standardized by 3GPP/3GPP2 where available.

The IMS service capabilities consist of session management, user data access, event subscription and notification, messaging, data manipulation, and conference control[1].

- **Session management** enables sessions, maintains session state, and provides control mechanisms e.g. re-direction or detection of unreachable SIP users and indications to requesting entities.
- **User data access** provides the service enablers the possibility to retrieve user information, e.g. information whether the IMS subscriber is currently reachable or not.
- **Event subscription and notification** capability provides a generic capability for subscribing to and notification of events e.g. user presence and watcher information.
- **Messaging** capability enables the distribution of multimedia content end-to-end.
- **Data manipulation** (a.k.a. group management) provides capabilities to configure, update and store data related to service enablers, e.g. presence authorization policies and access control lists to groups.
- **Conferencing** provides a set of control capabilities related to conference creation, configuration and management.

6.3.3 Supporting Capabilities

OMA service enabler realizations using IMS SHALL use the IMS supporting capabilities as standardized by 3GPP/3GPP2 where available.

Currently only one supporting capability has been identified - the charging capability. The supporting capabilities can be considered as non-essential to service enabler realizations. However, they do provide additional value by linking service enabler realizations to business logic infrastructure. Examples of such linkage are charging correlations, prepaid and postpaid charging.

[1] Editor's Note: some of these capabilities are yet to be approved by 3GPP/3GPP2

6.3.4 Common Capabilities

OMA service enabler realizations using IMS SHALL trust and use the IMS internal common capabilities as standardized by 3GPP/3GPP2. For example, IMS specifications include secured connections to deliver SIP signaling messages to an end user. The IMS also guarantees that the SIP user has been authenticated and authorized during the registration phase at the IMS level. Hence, the service enabler realizations can rely on users having been authenticated and authorized by the IMS system. In addition, there is a possibility to integrate service level authorization and IP level media treatment, and flexible charging based on signaling transactions and media.

Appendix A. Change History (Informative)

A.1 Approved Version History

Reference	Date	Description
OMA-RD_IMSinOMA-V1_0-20040518-A	18 May 2004	Version approved by OMA TP R&A (2004-05-05 to 2004-05-18)

A.2 Draft/Candidate Version V1.1 History

Document Identifier	Date	Sections	Description
Draft Version OMA-RD_IMSinOMA-V1_0	1 February 2005	2.1; 2.2; 3.3; A1; A2	Incorporaion of the changes/enhancements agreed in the IMS TF meeting during the ARC meeting in Frankfurt. This version includes the agreed changes of the corresponding CONRR
Candidate Version OMA-RE_IMSinOMA-V1_0	4 February 2005		Status changed to Candidate by TP TP ref #OMA-TP-2005-0065-IMSinOMA-V1_0-for-candidate-approval