Interworking of Messaging Services Requirements

Candidate Version 1.0 – 26 Jul 2005

Open Mobile Alliance

OMA-RD-MsgInterworking-V1_0-20050726-C

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document.

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

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

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

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

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

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

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms set forth above.

Contents

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document.

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document.

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document. [OMA-Template-ReqDoc-20050506-I]

1. Scope (Informative)

This document presents use cases and requirements for interworking of different messaging services and messaging systems in the mobile environment. The purpose of the use-cases is to highlight, from the user experience point of view, how the messaging services would interact in a seamless manner giving the user the feeling of total messaging.

The use-cases lead to a set of requirements for definition of what is needed for the messaging services to interwork seamlessly. This may lead to several different outcomes:

- A particular requirement is already fulfilled by existing specifications, e.g. the MM3 interface of MMS.
- There is a need for specification of additional messaging enablers to fulfil (a) requirement(s).
- A requirement is left for implementation and may not need standards.

The main purpose of use cases is to identify what pertinent functionality is possible with currently available standards, to identify areas where current standards are lacking, and based on that, make a prioritization of what should be standardized.

The scope of interworking is not limited to messaging systems deployed by a single network operator. Interworking between messaging systems involving two different wireless network operators or between a wireless network operator and another type of service provider is considered so as to evaluate commonalities that could be extracted from different messaging services. Each use case is separately studied, since call flows may be unique, and new messaging service elements (e.g. a new interface, protocol, or database) may be necessary.

Some services that are currently not under study elsewhere within OMA, such as Videotelephony Mailbox and Voicemail are considered in order to cover the entire messaging landscape, and extract commonalities, and evaluate opportunities for interworking with considerable market potential.

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document. [OMA-Template-ReqDoc-20050506-I]

2. References

2.1 Normative References

[MMS RD]	OMA-RD-MMS-V1_3-20040930-C, URL: http://www.openmobilealliance.org/
[MMS CONF RD]	OMA-RD-MMS-CONF-V1_2-20030609-C, URL: http://www.openmobilealliance.org/
[IM RD]	OMA-RD-IM-V1_0-20041118-C, URL: http://www.openmobilealliance.org/
[PoC RD]	OMA-RD-PoC-V1_0-20050204-C, URL: http://www.openmobilealliance.org/
[PAG RD]	OMA-RD-Presence-V1_0-20041111-C, URL: http://www.openmobilealliance.org/
[PAG GM RD]	OMA-RD-GM-V1_0-20040930-C, URL: http://www.openmobilealliance.org/
[REQ UPR RD]	OMA-RD-Privacy-V1_0-20031104-C, URL: http://www.openmobilealliance.org/
[TR 22.975]	"Advanced Addressing", 3rd Generation Partnership Project TR 22.975. URI: http://www.3gpp.org/ftp/Specs
[TS 22.240]	"3GPP Generic User Profile (GUP): Stage 1", 3rd Generation Partnership Project TS 22.240 Release 6. URI: http://www.3gpp.org/ftp/Specs
[TS 23.240]	"3GPP Generic User Profile (GUP): Stage 2", 3rd Generation Partnership Project TS 23.240 Release 6. URI: http://www.3gpp.org/ftp/Specs
[TS 29.240]	"3GPP Generic User Profile (GUP): Stage 3", 3rd Generation Partnership Project TS 29.240 Release 6. URI: http://www.3gpp.org/ftp/Specs
[RFC2119]	"Key words for use in RFCs to Indicate Requirement Levels". S. Bradner. March 1997. URL:http://www.ietf.org/rfc/rfc2119.txt

2.2 Informative References

(None)

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document.

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

Common functions	Functionality that is identified as supporting generic messaging and may be generalized to support all messaging and the interworking of different messaging services.
Messaging server	A networked entity that provides messaging functionality and represents an existing messaging server such as Email Server, PoC Server, IM Server, etc.
Messaging client	A user agent capable of generating messaging requests and receiving, processing, and displaying messages.

3.3 Abbreviations

IM	Instant Messaging
IP	Internet Protocol
MM	Multimedia Message
MMS	Multimedia Messaging Service
PoC	Push to talk over Cellular
SP	Service Provider
VM	Voice Message
VMS	Voice Messaging Service

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document.

4. Introduction (Informative)

The work connected to this RD is aimed at focusing on the problems associated with the interworking of different mobile messaging services that are being specified by different workgroups and standards fora. Examples of these messaging services include MMS, IM, Email, and PoC.

Each of the different messaging services provides its own mix of services, formats, and protocols, however, it may be advantageous in certain instances to promote interchange of messages between the different messaging services. This, however, is not a straight forward task today. A number of technical issues (e.g. addressing of users of other messaging domains) would have to be solved in order to provide a seamless service to the end user.

Enabling smooth interworking between different messaging services can provide a better user experience of person-to-person communication. Users subscribed to different services from different operators will be able to better communicate.

This RD presents use-cases for interworking between different messaging services, for example interworking between MMS and VMS. And it derives commonalities and requirements for supporting these use cases.

Also, the use cases provided in this RD are considered either within a network operator or between network operators.

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document.

5. Use Cases (Informative)

Various use cases can be considered either within a network operator or between network operators. All use cases are based on the concept of an interconnection agreement between the two parties. If not, the use cases are NOT valid and the messages will not be sent from one party to the other.

5.1 Use Case A – General Messaging within an Operator

5.1.1 Short Description

Using a generic mobile messaging service, Joey wants to send a message to Sammy who is subscribed in the same network operator.

5.1.2 Actors

- Joey
- Sammy
- Messaging client
- Messaging server
- Network provider

5.1.2.1 Actor Specific Issues

- Joey would like to send a message without knowing too much about the underlying technology.
- Sammy would like to receive the message from his friend using his mobile services.
- Network provider would like to supply messaging services that the customers find useful and friendly.

5.1.2.2 Actor Specific Benefits

- Joey is able to send a message to his friend, Sammy.
- Sammy is able to receive the message that Joey sent.
- Network provider has a significant increase in the number of messages sent, and therefore a significant increase in revenues.

5.1.3 Pre-conditions

- Joey has his favourite messaging client.
- Sammy has his favourite messaging client that may be different from the one selected by Joey.

5.1.4 Post-conditions

- Sammy received the message that Joey sent in his messaging client.

5.1.5 Normal Flow

① Joey composes a message using his favorite messaging client.

② Joey selects Sammy's entry in his address book as one of the destinations for the message.

③ Joey sends the message to Sammy.

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document.

④ A sending messaging server, in charge of Joey's messaging client, receives the message and starts to resolve the list of destinations. It may employ an external entity to select the proper address format to resolve Sammy's contact-name into a fully-specified destination.

⑤ The sending messaging server identifies that there is a need to transfer the message to a recipient server. The sending messaging server forwards the message to the recipient messaging server.

⑥ The recipient messaging server receives the message and notifies the recipient messaging client that there is a message to be delivered.

⑦ When Sammy requests to retrieve it, the recipient messaging server or other network element may reformat the content and then it sends the message to Sammy.

⑧ Sammy retrieves and views it with his messaging client.

5.1.6 Alternative Flow

① Joey composes a message using his favorite messaging client.

② Joey selects Sammy's entry in his address book as one of the destinations for the message.

③ Joey sends the message to Sammy.

④ A sending messaging server, in charge of Joey's messaging client, receives the message and starts to resolve the list of destinations. It may employ an external entity to select the proper address format to resolve Sammy's contact-name into a fully-specified destination.

⑤ The sending messaging server identifies that there is a need to transfer the message to a recipient server. The sending messaging server forwards the message to the recipient messaging server.

⑥ The recipient messaging server receives the message and relays the message to the recipient messaging client. Upon sending, the recipient messaging server or other network element may reformat the content prior to sending it to Sammy.

⑦ Sammy views the message with his messaging client.

5.1.7 Operational and Quality of Experience Requirements

The originator of a message should not need to be aware of the messaging service that recipients will use to access the message.

The originator of a message should be able to address the recipients in a short, generic fashion and have confidence that the message shall be delivered to the proper recipient.

The sending messaging server should take the recipient's current presence status into account when determining the recipient messaging server.

Users should be able to designate their "favourite" messaging service, both for composition and reception, where this does not degrade the quality of the messaging experience. A designated "favourite" messaging service takes precedence over presence information in the recipient messaging service determination process.

5.2 Use Case B – General Messaging between Operators

5.2.1 Short Description

Using a generic mobile messaging service, Joey wants to send a message to Sammy, who is subscribed in a different network operator.

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document.

5.2.2 Actors

- Joey
- Sammy
- Messaging client
- Messaging servers
- Network providers

5.2.2.1 Actor Specific Issues

- Joey would like to send a message without knowing too much about the underlying technology.
- Sammy would like to receive the message from his friend using his mobile services.
- Network providers would like to supply messaging services that the customers find useful and friendly.

5.2.2.2 Actor Specific Benefits

- Joey is able to send a message to his friend, Sammy.
- Sammy is able to receive the message that Joey sent.
- Network provider has a significant increase in the number of messages sent, and therefore a significant increase in revenues.

5.2.3 Pre-conditions

- Joey has his favourite messaging client.
- Sammy has his favourite messaging client that may be different from the one selected by Joey.
- Joey and Sammy are subscribed on different network operators.
- Sammy has a user profile that identifies his preferred messaging service to receive incoming messages.

5.2.4 Post-conditions

- Sammy received the message that Joey sent in his messaging client.

5.2.5 Normal Flow

① Joey composes a message using his favorite messaging client.

② Joey selects Sammy's entry in his address book as one of the destinations for the message.

③ Joey sends the message to Sammy.

④ An originating messaging server, in charge of Joey's messaging client, receives the message and starts to resolve the list of destinations. It may employ an external entity to select the proper address format to resolve Sammy's contact-name into a fully-specified destination.

⑤ The originating messaging server identifies that Sammy is subscribed on a neighbouring operator and therefore does not have access to Sammy's user-profile. Therefore, the originating messaging server forwards the message to the messaging server of the neighbouring operator that supports the same messaging service.

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document. [OMA-Template-ReqDoc-20050506-I]

⑥ The recipient-side messaging server accesses Sammy's user profile and identifies that there is a need to transfer the message to a recipient service server. The messaging server forwards the message to the recipient messaging server (note – this is a transfer between messaging services).

⑦ The recipient messaging server receives the message and notifies Sammy's recipient messaging client that there is a message to be delivered.

⑧ When Sammy requests to retrieve it, the recipient messaging server or other network element may reformat the content and then it sends the message to Sammy.

⑨ Sammy retrieves and views it with his messaging client.

5.2.6 Alternative Flow

① Joey composes a message using his favorite messaging client.

② Joey selects Sammy's entry in his address book as one of the destinations for the message.

③ Joey sends the message to Sammy.

④ An originating messaging server, in charge of Joey's messaging client, receives the message and starts to resolve the list of destinations. It may employ an external entity to select the proper address format to resolve Sammy's contact-name into a fully-specified destination.

⑤ The originating messaging server identifies that Sammy is subscribed on a neighbouring operator and therefore does not have access to Sammy's user-profile. Therefore, the originating messaging server forwards the message to the messaging server of the neighbouring operator that supports the same messaging service.

⑥ The recipient-side messaging server accesses Sammy's user profile and identifies that there is a need to transfer the message to a recipient service server. The messaging server forwards the message to the recipient messaging server (note – this is a transfer between messaging services).

⑧ The recipient messaging server receives the message and relays the message to the recipient messaging client. Upon sending, the recipient messaging server or other network element may reformat the content prior to sending it to Sammy.

⑨ Sammy views the message with his messaging client.

5.2.7 Other Alternative Flows

In step 5 of both flows – there are two variants that may be applicable -

If there is an agreement between the operators that allows access to the user profile information between the operators, then the originating messaging server should ascertain the preferred messaging service of the recipient and transfer to the local messaging service to transfer to the recipient-side messaging service server.

If the recipient operator does not support the originating messaging service, then the originating messaging server should either notify of an error in the transfer to the recipient operator, or if the recipient operator has a centralized messaging gateway, the message should be passed to the gateway for transfer to the recipient.

5.2.8 Operational and Quality of Experience Requirements

The originator of a message should not need to be aware of the messaging service that recipients will use to access the message.

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document. [OMA-Template-ReqDoc-20050506-I]

The originator of a message should be able to address the recipients in a short, generic fashion and have confidence that the message shall be delivered to the proper recipient.

The sending messaging server should take the recipient's current presence status into account when determining the recipient messaging server.

Users should be able to designate their "favourite" messaging service, both for composition and reception, where this does not degrade the quality of the messaging experience. A designated "favourite" messaging service takes precedence over presence information in the recipient messaging service determination process.

5.3 Use Case C – Email and MMS

5.3.1 Short Description

In this use case Michelle sends Stacy an MM showing of her baby's latest trick that she has just captured with her phone-camera. Stacy does not subscribe to an MMS service. So the MM is sent to Stacy's email so that she would be able to see it. And then Stacy replies to Michelle.

5.3.2 Actors

- Michelle
- Stacy
- Email client
- MMS client
- Email server
- MMS server

5.3.2.1 Actor Specific Issues

- Michelle would like to send or receive an MM via her MMS client.
- Stacy would like to send or receive an MM via her Email client.
- Network provider would like to supply an interworking service between Email and MMS.

5.3.2.2 Actor Specific Benefits

- Michelle is able to send or receive an MM via her MMS client without knowing messaging services that her friend has subscribed to.
- Stacy is able to send or receive an MM via one of possible messaging clients or her favourite messaging client, here, via her Email client.
- Network provider has a significant increase in the number of MM sent, and therefore a significant increase in revenues.

5.3.3 Pre-conditions

- Michelle has an MMS client and is an MMS subscriber.
- Stacy is a non-MMS subscriber and has both Email client and Email account.

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document. [OMA-Template-ReqDoc-20050506-I]

- Email server, MMS server or other network element converts an MM, if necessary, into the MM which is compatible with a recipient incompatible client.

5.3.4 Post-conditions

- Stacy retrieves the MM from Michelle via her Email client.
- Michelle retrieves the MM from Stacy via her MMS client.

5.3.5 Normal Flow 1 (MMS to Email)

① Michelle composes and sends an MM, addressing it to Stacy via her MMS client.

② Michelle's MMS server receives the MM and when resolving the recipient addresses determines that Stacy is not an MMS subscriber, and that the MM should be redirected to Stacy's email.

③ The MMS server may perform content adaptation to transform the content to a format that is acceptable to email.

④ The MMS server sends the MM to the Email server.

⑤ The Email server gets it and notifies Stacy's Email client that there is a message to be delivered.

⑥ When Stacy requests to get it, the Email server or other network element converts, if necessary, into the MM which is compatible with a Stacy's Email client.

⑦ When the MM has been received in Stacy's Email client she views it.

5.3.6 Normal Flow 2 (Email to MMS)

① Stacy replies to Michelle with an MM (or sends a new MM to her) via her Email client.

② The Email server receives the MM and forwards it to an MMS server based on address information in the original message.

③ The MMS server receives it and notifies Michelle's MMS client that there is an MM to be delivered.

④ When Michelle requests to retrieve it, the MMS server or other network element converts, if necessary, into the MM which is compatible with a Michelle's MMS client.

⑤ Michelle receives and views the reply from Stacy.

5.3.7 Alternative Flow

N/A

5.3.8 Operational and Quality of Experience Requirements

None.

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document.

5.4 Use Case D – MMS and VMS(1): between MMS and VM system

5.4.1 Short Description

In this use case JoAnn calls Michelle, who is unavailable, and leaves a VM. Michelle listens to the VM and decides to forward the cute message to her friend, Debbie, whohas an MMS client. So Debbie receives the VM via her MMS client and replies to Michelle.

5.4.2 Actors

- JoAnn
- Michelle
- Debbie
- MMS client
- MMS server
- VM system

5.4.2.1 Actor Specific Issues

- Michelle wishes to forward her VM to Debbie regardless of the underlying technology.
- Debbie wants to receive the VM and to reply via her MMS client.
- Network provider would like to supply an interworking service between MMS and VMS.

5.4.2.2 Actor Specific Benefits

- Michelle is able to send or receive a VM without knowing the preferences and subscriptions Debbie has.
- Debbie is capable to send or receive a VM using her prefered messaging service, MMS.
- Network operator increases the number of messages that use its network, and its profits.

5.4.3 Pre-conditions

- Debbie has an MMS client and is an MMS subscriber.
- Debbie's reply message is limited to a VM.

5.4.4 Post-conditions

- Debbie receives the VM from Michelle via her MMS client.
- Michelle retrieves the VM from Debbie.

5.4.5 Normal Flow 1 (VMS to MMS)

① JoAnn calls Michelle's phone number that is currently busy (or unreachable) and is redirected to her voicemail.

② When JoAnn leaves a VM for Michelle, a VM system records it.

③ Michelle connects to her VM system, listens to the VM, and forwards it to Debbie .

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document.

④ The VM system sends it to the MMS server.

⑤ The MMS server gets it and notifies Debbie's MMS client that there is a VM to be delivered.

⑥ On Debbie's request, she retrieves the VM via her MMS client.

5.4.6 Normal Flow 2 (MMS to VMS)

① Debbie generates a reply to Michelle via her MMS client. The client identifies that the original message was from a voicemail system and restricts the reply message content to a voice message.

② An MMS server receives the VM and forwards it to a VMS server based on addressing information.

③ The VMS server gets the VM and notifies Michelle's VMS client that there is a message to be delivered.

④ When the VM has been reached in her VMS client Michelle connects to her VM system and listens to the reply that Debbie left.

5.4.7 Alternative Flow

N/A

5.4.8 Operational and Quality of Experience Requirements

When replying to a message the messaging client should identify that the reply message is intended for a recipient using a different messaging service and should appropriately restrict the composition of the reply message.

5.5 Use Case E – MMS and VMS(2): between MMS and VMS

5.5.1 Short Description

Richard sends Anna a VM via his MMS client. Anna gets the VM via her VMS client. Or she can receive it via her MMS client when she gets it on her VMS server.

5.5.2 Actors

- Richard
- Anna
- MMS client
- VMS client
- MMS server
- VMS server

5.5.2.1 Actor Specific Issues

- Richard wants to send a VM via his MMS client.
- Anna wishes to receive a VM via her VMS or MMS client.
- Network provider would like to supply an interworking service between MMS and VMS. .

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document. [OMA-Template-ReqDoc-20050506-I]

5.5.2.2 Actor Specific Benefits

- Richard is able to send a VM via his MMS client without knowing messaging services that Anna has subscribed to.
- Anna is able to send or receive a VM via her VMS or MMS client.
- Network provider has a significant increase in the number of MM sent, and therefore a significant increase in revenues.

5.5.3 Pre-conditions

- Richard has an MMS client and is an MMS subscriber.
- Anna has a VMS and MMS client and is a VMS and MMS subscriber.

5.5.4 Post-conditions

- Anna receives the VM from Richard via her VMS client.
- When Anna gets a VM on her VMS server she can receive it via her MMS client.

5.5.5 Normal Flow 1 (MMS to VMS)

① Richard records a VM with his MMS client and sends it to Anna.

② An MMS server receives it and finds out that Anna wants to receive it via her MMS client.

③ The MMS server sends it to the VMS server.

④ The VMS server gets it and notifies Anna's VMS client that there is a VM to be delivered.

⑤ On Anna's acceptance, the VMS server sends it to Anna's VMS client.

⑥ Anna listens to the message that Richard left.

5.5.6 Normal Flow 2 (VMS to MMS)

① Anna receives a VM on her VMS server.

② The MMS server gets it from the VMS server and notifies her MMS client that there is a VM to be delivered.

③ Anna receives the VM via her MMS client.

5.5.7 Alternative Flow

N/A

5.5.8 Operational and Quality of Experience Requirements

None.

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document.

5.6 Use Case F – MMS and VMS(3): Congestion Case

5.6.1 Short Description

Alison (a VMS user) has travelled to a Wireless Technology Convention. Alison has received several important VM messages from her office, as well as from a prospective overseas client, who is also attending the Convention, and with whom she was attempting to arrange a business meeting. Although Alison has received VM notification, she was unable for several hours to retrieve her VM messages due to unusually high volumes of cellular traffic caused by Convention goers, and exacerbated by a spell of bad weather in the area.

However, by virtue of implementing VM-MMS interworking, the voice messages were deposited to Alison's MMS server, and delivered as packets to her handset, despite the high rate of circuit-switched blocking, so that she is able to hear them.

5.6.2 Actors

- Alison is a voicemail user who also subscribes to VM delivery via MMS, visiting a Wireless Technology Convention.
- Other Convention goers and local residents in the city where the Convention is taking place.
- Network operator that supplies the MMS, and voicemail services.

5.6.2.1 Actor Specific Issues

- Alison wishes to receive time critical voice messages from the office and the business client.
- Other Convention goers and local residents contribute to unusually high voice traffic volumes in the vicinity of the Convention.
- Network provider supplies services that allow subscribers with wide ranging needs to access those services at reasonable cost. This includes a large number of home subscribers attempting to cope with effects of inclement weather and natural disasters, as well as some very discerning business users with time critical tasks.

5.6.2.2 Actor Specific Benefits

- Alison: Time critical VM is delivered to Alison despite a high degree of congestion in the network.
- Other Convention goers and residents: Benefit from reduced voice traffic load by users such as Alison, who reduce reliance on voice calls to retrieve their voice-mail, including extra Erlangs needed to issue commands to the VM system on a circuit-switched call.
- Network operator: Offers a higher quality of service by virtue of lesser call blocking than would have been the case, had Alison and others like her resorted to traditional VM retrieval.
- Had it not been possible to deliver VM via MMS, the following would have occurred:
- Alison may have not been able to retrieve her VM messages during several attempts she made during breaks in the Convention proceedings, due to cellular network high rate of blocking.
- Other convention goers would have experienced increased blocking due to Alison and others like her adding Erlangs of demand on the network which is already congested.
- Network operator may have not met its network performance targets, and though the revenue is increased temporarily due to added traffic, the outlook is not so bright because the operator must invest additional capital to upgrade the network with additional voice capacity for future conditions such as this one, must scale back its initial intent to offer advanced data services instead, and may suffer from increased churn in the area from dissatisfied users who could not use the network at critical times. VM system itself may have suffered from higher rate of blocking due to higher-than-usual diversion of traffic to VM, or may have had higher message deletion rate due to storage exhaust.

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document. [OMA-Template-ReqDoc-20050506-I]

5.6.3 Pre-conditions

- Alison is subscribed to Voice Mail and to MMS. The cellular network that she is using at the time of attending the Wireless Technology Convention is capable of delivering VM notification. Alison's handset can receive and replay MMS messages.

5.6.4 Post-conditions

- Alison can receive voice mails deposited for her despite the fact that it is difficult at times to access the cellular network for the purpose of making voice calls.
- Cellular network operator was able to handle more voice traffic than would have been the case had Alison and people like her used voice calls to access VM.
- Other Cconvention attendees and local residents are able to use the cellular network with a higher rate of success than in the pre-condition case.

5.6.5 Normal Flow

① A caller attempting to reach Alison on her cellular phone is unable to contact her directly due to a high rate of blocking in the destination network. The call is diverted to VM, and a VM message is deposited in Alison's VM box.

② The VM system issues VM notification to Alison's handset, then proceeds to copy the VM message to the MMS server, having assured that Alison's handset supports MMS and the service is activated.

③ Once the MMS server delivers the message to Alison's handset, it contacts the VM system to erase the VM message.

④ In the handset, the MMS client intervenes with the VM notification flag, so that any VM retrieval attempt by Alison is diverted to MMS replay.

⑤ Once Alison decides to retrieve the message, her initial action (e.g. keypunch sequence to access VM message) is as if the VM been retrieved by means of a call to the VM centre. However, she is pleased to hear the message without noticeable call setup delay or congestion-caused blocking. The command prompts from that point on may be similar to the traditional VM access, or slightly altered.

5.6.6 Alternative Flow

There may be some variants to the flow to account for the following:

① If the called party handset is not capable of retrieving MMS, or the service had not been activated, the VM system takes no action other than VM notification.

② If the handset memory is full, handset is not reachable, or there is some other reason that MMS delivery could not be immediately accomplished, the VM system is notified, and the message is kept deposited in the VM system until such time that it can be delivered to the handset via MMS.

③ If the subscriber was not reachable (e.g. handset was turned off) at the time of message deposition, subsequent location registration upon change of availability status should trigger notification to the VM system and MMS system, which should cause message delivery as described in the Normal Flow.

④ It may be advantageous to not issue VM notification to the handset immediately upon message deposition. Instead, the VM system copies the message to the MMS first and waits for a short period of time, sufficient to allow MMS delivery. If delivery confirmation is not received from the MMS server, the VM system only then issues the traditional VM notification.

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document. [OMA-Template-ReqDoc-20050506-I]

⑤ Other conditions to consider include: User preference, competition with other packet services for delivery.

⑥ As an additional possibility, the decision to copy VM message to the MMS server is not automatic, and may hinge upon Alison's judgment of importance of the message and/or her specific instructions to the VM server on whether or not to forward to MMS. Or it may be based on presence/availability status which may depend on the calling party.

5.6.7 Operational and Quality of Experience Requirements

Ease of Use: The retrieval of the VM message using MMS client should be substantially the same as the traditional voice mail, i.e., the user should not have to think which retrieval method to apply, depending on whether the message is deposited to the handset, or must be retrieved from the VM/MMS.

Performance, Reliability, Quality: From the perspective of Alison as a user, the message retrieval performance should be improved compared to traditional VM retrieval. In particular, it should be faster, more reliable (no blocking), and without a loss of speech segments which may occur as a result of radio transmission for a voice call. **Network Operational Requirements:** The delivery of VM via MMS should result in high degree of reliability and no loss of VM messages. The overall network performance in terms of its ability to offer other services (data throughput, blocking rate) shall be at least as good as for the case of traditional VM delivery, and should be improved on both accounts. The performance of the VM system shall be improved in the following aspects: The capacity of the VM system shall be extended due to reduced average in-network storage time of messages. The blocking rate of the VM system shall be lowered, and should be eliminated. The bulk of the circuit-switched traffic to/from the VM depository should be for message deposition purpose, with traffic for the message retrieval reduced proportionate to the penetration of MMS capable terminal devices.

5.7 Use Case G – MMS and VMS(4): VM Submission to MMS

5.7.1 Short Description

Bernadette and her co-workers at ACME Enterprises use voice mail frequently to call on the clients and each other during the daily job routine. Voice communication is particularly convenient since Bernadette's job involves a lot of driving. Since ACME Enterprises employees are often tied up with other clients, much of the calling to each other is diverted to voicemail. Likewise, since ACME clientele is high-profiled and difficult to reach by a phone call, the same applies to attempted calls to her clients.

It is critical that the voice messages left by Bernadette reach her clients and co-workers in the form of MMS. It is also critical for the wireless network operator to offer to ACME Enterprises the flexibility of using voice communication combined with the efficiency of MMS.

5.7.2 Actors

- Bernadette is a voicemail user who also subscribes to VM submission via MMS.
- ACME Enterprises is a corporation that relies heavily on voice communications among employees and clients.
- Network operator that supplies the MMS, and voicemail services.

5.7.2.1 Actor Specific Issues

- Bernadette wants to use voice messages to communicate with her business associates and clients, so that she can manage her time better while driving between client sites.
- ACME Enterprises wants their employees to be in reliable and high quality contact with each other and their clients.

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document.

- Network provider supplies services that allow subscribers with wide ranging needs to access those services at reasonable cost, flexibility, and for the important business users, such as ACME Enterprises employees, with high degree of reliability.

5.7.2.2 Actor Specific Benefits

- Bernadette: Can improve management of her time by sending voice messages while driving, with behaviour similar to customary voice calling. It is considered beneficial for Bernadette to use a more modern voice messaging without having to learn or execute while driving a new way of message composition that may be involved in MMS.

- ACME Enterprises employees and clients: Can receive high quality and timely voice messages, can manage them without placing a phone call to the VM system. Note for example that access to the VM system usually requires time consuming user steps in authentication, which can be streamlined in the case of MMS, since they are largely performed automatically by network and user agent interactions. Also, it should be emphasized that VM systems today rely on 64 kbps switching to VM trunks (which requires transcoding) and VM-specific voice coding/compression, which can be eliminated with MMS. Several steps in transcoding may impair voice quality, in addition to adding to expense due to added use of network resources, particularly in a real-time call.

- Network operator: Offers a higher quality and more flexible service by virtue of reduced reliance on real time calls, be it between the parties, or to retrieve the VM.

5.7.3 Pre-conditions

- Bernadette need not be subscribed to Voice Mail (for voice mail delivery, this is not necessary), but may need to be subscribed to MMS. The cellular network is capable of handling VM and MMS.

5.7.4 Post-conditions

- Bernadette was able to send voice messages to her co-workers and clients, which were delivered in the packet form via MMS. Bernadette's behaviour in doing so is essentially the same (e.g. she can use "speed dial"), as if she was making phone calls and leaving VM messages as necessary.

- ACME Enterprises serves its clients well aided by voice communications at reasonable cost and high degree of quality.

- Wireless network provider is able to serve the distinguishing corporate client with a high degree of service during busy hours in the network.

5.7.5 Normal Flow

Note: The text is Normal Flow and Alternate Flow is meant to illustrate the use case, not to prescribe the solution.

- Bernadette makes a voice call from her vehicle to her client in a usual safe and substantially hands-free fashion, e.g. by speed dialling or voice dialling.

- The dialled number is busy. The legacy switching system involved in handling the call forwards it to the VM server. It should be noted that the legacy system treats all the calls the same way, whether they come from a simple landline phone, or a sophisticated MMS capable wireless phone. Thus VM server must be involved in the flow. VM server prompts the calling party to "press 1 to leave a message via MMS", then commands the mobile MMS user agent to create an MMS. The VM server interaction ends when the user presses 1 and the command is acknowledged.

- The voice message is first recorded on the mobile then submitted to the MMS server. The message is forwarded to the destination device identified by the dialled phone number.

- The called party is notified of the newly arrived multimedia message in the usual fashion, or the message may be pushed to the destination device. If the called party is a simple voice-only device, the message is routed via VM server for notification, and kept deposited there until such time that the destination device decides to retrieve it

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document. [OMA-Template-ReqDoc-20050506-I]

5.7.6 Alternative Flow

- In the first alternative, prior to making the call, Bernadette checks the destination Presence/Availability (this may be automatic, upon call attempt being made). If the call recipient is not present/available, no phone call is made immediately. Instead, the MMS submission client on Bernadette's device assists in creating an MMS voice message. Upon completion, the MMS client submits the message to Bernadette's MMS server, with the destination address identified by the called party selected by Bernadette (this may also be a group).
- The MMS server then forwards the voice message to the destination device or devices.
- In another alternative, the system does not rely on the caller to correctly identify device capability, but the VM server may look it up, or it may be cached.

5.7.7 Operational and Quality of Experience Requirements

Ease of Use: The deposition of the voice message using MMS client should be substantially the same as the traditional voice mail, i.e., Bernadette should not have to think which deposition method to apply, depending on whether the message is first created in the handset MMS client, or simply deposed in the VMC or MMS server.

Performance, Reliability, Quality: From the perspective of Bernadette as a user, the message deposition performance should be improved compared to traditional VM deposition. In particular, it should be faster (no need to ring a phone if the user status is "Not Available", more reliable (no blocking), and without a loss of speech segments which may occur as a result of radio transmission for a voice call.

Network Operational Requirements: The submission of voice messages via MMS should result in high degree of reliability and no loss of voice messages. The overall network performance in terms of its ability to offer other services (data throughput, blocking rate) shall be at least as good as for the case of traditional VM submission, and should be improved on both accounts. The performance of the voice messaging system (relative to traditional VM) shall be improved in the following aspects: The capacity of the voice messaging system shall be extended due to reduced average in-network storage time of messages. The blocking rate of the MMS system for voice message use shall be lowered, and should be eliminated.

5.8 Use Case H – PoC and VMS

5.8.1 Short Description

Sonia leaves a VM to her friend, Edu, via her PoC client. Edu does not subscribe to PoC, but does to VMS, so he gets the VM on his VMS client. When he replies to Sonia with his VM she gets it via her PoC client.

5.8.2 Actors

- Sonia
- Edu
- PoC client
- VMS client
- PoC server
- VMS server

5.8.2.1 Actor Specific Issues

- Sonia wants to leave or listen to a VM to her friend, Edu, via her PoC client.
- Edu wishes to send and receive a VM via his VMS client.

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document. [OMA-Template-ReqDoc-20050506-I]

- Network provider would like to supply an interworking service between PoC and VMS.

5.8.2.2 Actor Specific Benefits

- Sonia is able to leave or listen to a VM via her PoC client without knowing messaging services that her friend has subscribed to.
- Edu is able to send and receive a VM via one of possible messaging clients or his favourite messaging client, here, via his VMS client.
- Network provider has a significant increase in the number of VM sent, and therefore a significant increase in revenues.

5.8.3 Pre-conditions

- Sonia has a PoC client and is a PoC subscriber.
- Edu has a VMS client and is a VMS subscriber.
- PoC service supports addressing recipient whose Presence and Availability is not known.
- PoC server has a functionality of recording a VM.
- PoC server has a functionality of sending and receiving a VM.

5.8.4 Post-conditions

- Edu retrieves the VM from Sonia via his VMS client.
- Sonia checks and listens to the VM from Edu via her PoC client.

5.8.5 Normal Flow 1 (PoC to VMS)

① Sonia leaves a VM with her PoC client and addresses it to Edu.

② A PoC server records it and finds that Edu is not present and prefers to receive the VM via his VMS client.

③ The PoC server sends it to the VMS server.

④ The VMS server gets it and notifies Edu's VMS client that there is a VM to be delivered.

⑤ On his acceptance, the VMS server sends it to Edu's VMS client.

⑥ Edu listens to the VM that Sonia left.

5.8.6 Normal Flow 2 (VMS to PoC)

① To reply to Sonia, Edu records a VM, using his VMS client and sends it to her.

② A VMS server receives it and determines that Sonia should listen to it via her PoC client.

③ The VMS server sends it to a PoC server.

④ The PoC server gets it and initiatesa PoC session with Sonia's client and sends notification that there is a VM to be delivered.

⑤ After her acceptance, she connects the PoC server and listens to the VM that Edu left.

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document.

5.8.7 Alternative Flow

N/A

5.8.8 Operational and Quality of Experience Requirements

Both Sonia and Edu should receive the VMs in the normal user experience for their preferred client.

5.9 Use Case I – PoC and MMS

5.9.1 Short Description

Paola leaves a VM via her PoC client to her friend, Malcolm. Malcolm does not subscribe to PoC, but does to MMS, so he gets the VM via his MMS client. And he responds to her.

5.9.2 Actors

- Paola
- Malcolm
- PoC client
- MMS client
- PoC server
- MMS server

5.9.2.1 Actor Specific Issues

- Paola wants to leave or listen to a VM via her PoC client.
- Malcolm wishes to send or receive a VM via his MMS client.
- Network provider would like to supply an interworking service between PoC and MMS.

5.9.2.2 Actor Specific Benefits

- Paola wants to leave or listen to a VM via her PoC client without knowing messaging services that her friend has subscribed to.
- Malcolm wishes to send or receive a VM via one of possible messaging clients or his favourite messaging client, here, via his MMS client.
- Network provider has a significant increase in the number of VM sent, and therefore a significant increase in revenues.

5.9.3 Pre-conditions

- Paola has a PoC client and is a PoC subscriber.
- Malcolm has an MMS client and is an MMS subscriber.
- PoC service supports addressing recipient whose Presence and Availability is not known.
- PoC server has a functionality of recording a VM.

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document.

- PoC server has a functionality of sending and receiving a VM.

5.9.4 Post-conditions

- Malcolm retrieves the VM from Paola via his MMS client.
- Paola checks and listens to the VM from Malcolm via her PoC client.

5.9.5 Normal Flow 1 (PoC to MMS)

① Paola leaves a VM with her PoC client and addresses it to Malcolm.

② A PoC server records it and finds out that Malcolm is not present and prefers to receive the VM on his MMS client.

③ The PoC server sends it to the MMS server.

④ The MMS server receives it and notifies his MMS client that there is a MM to be delivered.

⑤ On his request to get, the MMS server sends it to his MMS client.

⑥ He receives and listens to the content.

5.9.6 Normal Flow 2 (MMS to PoC)

① Malcolm responds to Paola by composing a VM with his MMS client and sending it to her.

② An MMS server gets it and finds out that Paola will receive it via her PoC client.

③ The MMS Server adapts the MM to be a PoC compatible VM (without the presentation part).

④ The MMS server sends the VM to the PoC server.

⑤ The PoC server receives it and initiates a PoC session with Paola's client and sends notification that there is a VM to be delivered.

⑥ Paola connects the PoC server and listens to the VM via her PoC client.

5.9.7 Alternative Flow

N/A

5.9.8 Operational and Quality of Experience Requirements

None.

5.10 Use Case J – IM and MMS

5.10.1 Short Description

Stacy sends Tommy an MM with her IM client. Tommy wants to get it via his MMS client. Or he has one messaging client, an MMS client, not an IM client. In this case the MM is sent to him via his MMS client. Reversly Tommy can send an MM to her, if he knows her IM address.

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document. [OMA-Template-ReqDoc-20050506-I]

5.10.2 Actors

- Stacy
- Tommy
- IM client
- MMS client
- IM server
- MMS server

5.10.2.1 Actor Specific Issues

- Stacy wants to send or receive an MM via her IM client.
- Tommy wants to send or retrieve an MM via his MMS client.
- Network provider would like to supply an interworking service between IM and MMS.

5.10.2.2 Actor Specific Benefits

- Stacy is able to send or receive an MM via her IM client without knowing too much about the underlying technology.
- Tommy is able to send or receive an MM via one of possible messaging clients or his favourite messaging client, here, via his MMS client.
- Network provider has a significant increase in the number of MM sent, and therefore a significant increase in revenues.

5.10.3 Pre-conditions

- Stacy has an IM client and is an IM subscriber.
- Tommy has an MMS client and is an MMS subscriber.
- Tommy knows Stacy's IM address.
- IM server or MMS server has a functionality of converting message format. For example, MMS server can convert an IM message format into an MMS message one.
- MMS server or other network element converts an MM content, if necessary, into the MM content which is compatible with a recipient incompatible handset.
- IM server has a functionality of sending and receiving an MM.
- All recipients whom Stacy wants to send an MM are registered in her IM client.

5.10.4 Post-conditions

- Tommy retrieves the MM from Stacy via his MMS client.
- Stacy receives the MM from Tommy via her IM client.

5.10.5 Normal Flow 1 (IM to MMS)

① Stacy sends an MM to Tommy via her IM client.

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document. [OMA-Template-ReqDoc-20050506-I]

② An IM server receives the MM.

③ The IM server sends the MM to an MMS server.

④ The MMS server retrieves it and notifies his MMS client that there is an MM to be delivered.

⑤ When Tommy requests to get it, the MMS server or other network element converts the original MM content, if necessary, into the MM content which is compatible in his handset and forwards it to his MMS client.

⑥ When the MM has been successfully reached in his MMS client he views it.

⑦ If a delivery report has been requested by Stacy it is sent to her**.**

5.10.6 Normal Flow 2 (MMS to IM)

① Tommy sends an MM to Stacy via his MMS client.

② An MMS server receives the MM and finds out that Stacy doesn't have an MMS client but he has an available IM address.

③ The MMS server sends the MM to an IM server, which notifies her IM client that there is an MM to be delivered.

④ When the MM has been successfully reached in his MMS client he views it.

5.10.7 Alternative Flow

N/A

5.10.8 Operational and Quality of Experience Requirements

IM client may have the functionality to show possible service applications as well as presence information. Accordingly, Stacy may know whether Tommy can get an MM via his MMS client.

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document.

6. Common Functionalities (Informative)

This section contains conclusions from the use-cases presented in chapter 5. These conclusions comprise a set of common messaging functionalities and interfaces, and are derived by analyzing the use-cases. Additionally, an attempt is made to place the functionality either at the messaging client or at the messaging server, noting that either can be message source or message destination.

These common functionalities are used in the following chapter to assist in identifying the requirements for messaging interworking. The purpose of identifying these common functionalities is to fulfil the purpose identified in the introduction – to identify potential enablers needed to support both messaging in general and the interworking of messaging services. These enablers may already exist in OMA specifications, may need to be developed by future work in OMA, or may be considered to be implementation issues and therefore out of scope for OMA specification. In any case, only the messaging requirements from these common functionalities will be addressed in the next section on requirements and their full specification is out of scope for this document.

[CF1]	One or more messaging clients access an address book that may be either on the terminal or network-based.
[CF2]	One or more messaging servers access the user's profile to determine: • Originator's right to submit a message • Recipient's right to receive a message • Recipient's preferred messaging service, if applicable
[CF3]	One or more messaging servers resolve message address, possibly using an external interface.
[CF4]	One or more messaging servers resolve recipient's current presence status, possibly using an external interface.
[CF5]	One or more messaging servers perform content adaptation and transcoding, possibly using an external interface.
[CF6]	One or more messaging servers notify recipient client that message is available either by a notification message or by the actual content of the message.
[CF7]	One or more messaging clients may access addresses that appear in an original message to address a new message (example: extracting reply address from the original message).
[CF8]	One or more messaging servers should identify the source messaging service for messages sent to a recipient server.
[CF9]	One or more messaging clients may identify the source messaging service of a received message.
[CF10]	One or more messaging servers should support legal intercept of messages either submitted or received by the user.

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document. [OMA-Template-ReqDoc-20050506-I]

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document.

7. Requirements (Normative)

7.1 High-Level Functional Requirements

[R100]	One or more messaging servers SHOULD support the following Functions: • Address book/resolution • User profile – rights to send and receive messages • Presence resolution • Notification of a new message • Legal intercept • Content adaptation
[R101]	One or more messaging clients SHOULD support the following Functions: • Destination addressing through an Address Book • Notification of a new message
[R102]	Messages SHOULD be reliably transmitted between messaging services without any loss of messages.
[R103]	When transferring a message between different operators and the ultimate destination service cannot be identified – the message SHOULD be transferred over the inter-operator interface of the originating messaging service, e.g., MM4 for MMS.

7.1.1 Security

[R110]	Messaging service SHOULD support authentication and authorization of messaging clients during the registration phase as well as messaging service attempts.
[R111]	The Recipient messaging server SHALL validate the messaging service that is subscribed by that recipient prior to the service delivery. Validation may be performed by an external enabler (e.g., HLR, HSS) to examine the subscription contract or profile whether receiving the messaging service is subscribed by the recipient.
[R112]	One or more messaging servers SHOULD allow preserving the integrity and confidentiality of the message content when transferring across different messaging domains.

7.1.2 Charging

[R120]	One or more messaging servers SHALL generate appropriate charging information for all interface transactions. The following information SHOULD be generated as a minimum: • Message size • Message type • Time of day • QoS-Priority • Source and destination address

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document. [OMA-Template-ReqDoc-20050506-I]

7.1.3 Presence

[R130]	Sending messaging server SHOULD access the recipient's presence server to resolve the recipient's current presence status.

7.1.4 Usability

[R140]	One or more messaging clients SHOULD allow the message originator to address a recipient in a simplified format (for example a nickname or an abbreviated form of addressing).
[R141]	The system SHOULD indicate an originator the recipient messaging service type, for the purpose of providing information e.g., charging in case of different charging between different messaging service types.
[R142]	The system MAY notify a recipient of a message what kind of messaging service type (e.g., VMS, MMS, IM) is used to receive the message.
[R143]	The system MAY allow a user to choose a specific messaging service type used to originate or receive a message.
[R144]	One or more messaging servers SHOULD modify the message content and/or structure as required by the recipient messaging servers.
[R145]	One or more messaging servers SHOULD indicate in the received message all changes/adaptations made to the content of a message.
[R146]	One or more messaging servers MAY notify the originator of changes/adaptations made to the content of a message.
[R147]	One or more messaging clients SHOULD be supported with information on presence status of all recipients registered in the client.
[R148]	One or more messaging servers SHOULD allow the recipient to identify a preferred messaging service for incoming messages.

7.1.5 Interoperability

[R150]	One or more messaging servers SHOULD support interoperability of messages to allow transforming of a message from one messaging service to a message of a different messaging service.

7.1.6 Privacy

[R160]	The messaging system SHALL support message privacy, as per [REQ UPR RD], i.e. non-disclosure of the message content or header information to unauthorized access.
[R161]	The messaging system SHALL be compatible with protection of the user's device against spam (message, content, downloads) from undesirable third parties.

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document. [OMA-Template-ReqDoc-20050506-I]

7.2 System Elements

7.2.1 Messaging Server

7.2.1.1 Address Resolution Dependencies

[R210]	One or more messaging servers SHOULD access the originator's address book to resolve non-fully qualified addresses.
[R211]	Address resolution SHOULD include information indicating transformation for addressing to supported address formats for messaging.
[R212]	Address resolution SHOULD support addition of new information to address entry.
[R213]	Address resolution SHOULD support transformation of any input address format to a requested different address format.
[R214]	One or more messaging servers MAY resolve addresses based on global address resolution tools.

7.2.1.2 User Profile Dependencies

[R220]	One or more messaging servers SHOULD verify originator's rights to submit message for distribution.
[R221]	One or more messaging servers SHOULD verify recipient's rights to receive a message.
[R222]	One or more messaging servers SHOULD determine recipient's preferred messaging service.
[R223]	One or more messaging servers SHOULD determine recipient's configured target handset.

7.2.1.3 Network Message Store Dependencies

[R230]	One or more messaging servers SHALL be able to save messages in a network message store, if messages are stored on the network.

7.2.1.4 Message Format Adaptation Dependencies

[R240]	Messaging Interworking server SHALL support message format adaptation between the following standard message formats: • Multimedia Message and Instant Message • Multimedia Message and Voicemail Message • Instant Message and Short Message notification • Push-to-talk over cellular transmission and Voicemail Message • Push-to-talk over cellular transmission and Instant Messaging
[R241]	One or more messaging servers SHOULD identify message content limitations of recipient messaging server. • Examples would be not to send images to voicemail or voice to SMS.

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document.

7.2.1.5 Content Adaptation Dependencies

[R250]	Recipient messaging server SHOULD support content adaptation to allow compatibility with recipient messaging client.

7.2.1.6 Using Message

[R260]	One or more messaging servers SHOULD use the source messaging service type which is included in the message provided by a sending messaging client.
[R261]	One or more messaging servers MAY use the destination messaging service type which is included in the message provided by a sending messaging client.

7.2.2 Messaging Client

7.2.2.1 Address Book Cependencies

[R310]	One or more messaging clients SHALL support addressing of message recipients from user's address book.
[R311]	One or more messaging clients SHOULD support addressing using a non fully qualified recipient address. This address SHALL be resolved by the messaging server.

7.2.2.2 Sending Message

[R320]	One or more messaging clients SHOULD include the source messaging service type in sending a message.
[R321]	One or more messaging clients SHOULD include the destination messaging service type in sending a message.

7.2.2.3 Received Message

[R330]	One or more messaging clients SHOULD be able to identify the source messaging service of the message.
[R331]	One or more messaging clients SHALL be able to access the addresses that appear in the message to allow for generation of reply messages.

7.2.2.4 Network Message Store Dependencies

[R340]	One or more messaging clients SHALL support retrieving a message from network message store, if message is stored on network.
[R341]	One or more messaging clients SHALL support saving messages to network message store, if message store is supported.

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document. [OMA-Template-ReqDoc-20050506-I]

Appendix A. Change History (Informative)

A.1 Approved Version History

Reference	Date	Description
n/a	n/a	No prior version

A.2 Draft/Candidate Version 1.0 History

Document Identifier	Date	Sections	Description
OMA-RD-MsgInterworking-20040524-D	24 May 2004	The entire document	Incorporates inputs to committee: OMA-MWG-2004-0036R02 OMA-MWG-2004-0041
OMA-RD-MsgInterworking-20040601-D	1 June 2004	The entire document	Incorporates inputs to committee: OMA-MWG-2004-0063 OMA-MWG-2004-0063R01
OMA-RD-MsgInterworking-20040613-D	13 June 2004	4, 5.1	Revise introduction and use case A according to R&A comment.
OMA-RD-MsgInterworking-20040615-D	15 June 2004	5.6, 7.1.1 5.2/3/4/5/8/9	Incorporates inputs to committee: OMA-MWG-2004-0081-VM-MMS-Interworking OMA-MWG-2004-0064-proposal to add a security req Change MMSC to MMS server
OMA-RD-MsgInterworking-20040625-D	25 June 2004	6, 7	Incorporates inputs to committee: OMA-MWG-2004-0077-Interworking-Derived-requirements
OMA-RD-MsgInterworking-20040712-D	07 July 2004	7.3.1.5 7.3.1.3 2.1, 3.4 5.1/2/3/7/8	Incorporates inputs to committee: OMA-MWG-2004-0090-requirement regarding interfaces to content adaptation OMA-MWG-2004-0091-requirement interfaces to network message store OMA-MWG-2004-0092-references and definitions OMA-MWG-2004-0093R01-Interworking-RD-Editorial-Changes
OMA-RD-MsgInterworking-20040901-D	01 September 2004	5.7/8 3.2 6, 7	Incorporates inputs to committee: OMA-MWG-2004-0096-CR-Correction of use cases regarding PoC OMA-MWG-2004-0098R01-CR-Definitions-of-Server-Client OMA-MWG-2004-0102R01-Interworking-Requirements-Input
OMA-RD-MsgInterworking-20040903-D	03 September 2004	7.1	Some editorial changes Incorporates inputs to committee: OMA-MWG-2004-0113R01-CR-requirement-Message loss
OMA-RD-MsgInterworking-20041122-D	22 November 2004	7.1.4 5.2, 7.1 1, 7.1, 7.1.1	Incorporates inputs to committee: OMA-MWG-2004-0114-CR-requirement-usability OMA-MWG-2004-0130R01-Inter-operatir-use-case Agreed changes during the f2f meeting in Barcelona.
OMA-RD-MsgInterworking-20041223-D	23 December 2004	1	Incorporates inputs to committee: OMA-MWG-2004-0145-Messaging-Interworking-Scope
OAM-RD-MsgInterworking-20050318-D	18 March 2005	all	Incorporates inputs to committee: OMA-MWG-2005-0016-clarify_external_enabler_in_IW_RD OMA-MWG-2005-0020-CR-Msgng-Interworking-RD-for-RDRR OMA-MWG-2005-0022-dependencies-on-Address-Book-and-User-Profile OMA-MWG-2005-0023-update-references OMA-MWG-2005-0024-re-definition OMA-MWG-2005-0027-CR-IW_RD-Req_100_101_102 OMA-MWG-2005-0021R01-CR-Direct-Delivery OMA-MWG-2005-0031-users_IW_RD Editorial changes shown in OMA-RDRR-MsgInterworking-V1_1-20050228-D

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document.

Document Identifier	Date	Sections	Description
OMA-RD-MsgInterworking-20050404-D	04 April 2005	4 5.1/2, 6, 7.1	Incorporates inputs to committee: OMA-MWG-2005-0015-Introduction_IW_RD OMA-MWG-2005-0028-CR-Add-Presence
OMA-RD-MsgInterworking-20050606-D	06 June 2005	7.1.1 7.2 5.1/2 7.1.4/7.1.6 7.1.4 4 7.1.6 7.1.4	Incorporates inputs to committee: OMA-MWG-2005-0032-Change-R130 OMA-MWG-2005-0041R01-CR-requirement-messaging service type OMA-MWG-2005-0049-CR-clarification in 5.1 and 5.2 OMA-MWG-2005-0050-CR-Clarification-the term of system OMA-MWG-2005-0051-CR-Clarification-usability requirement OMA-MWG-2005-0052-CR-introduction OMA-MWG-2005-0053R01-CONRR_002-Privacy_Requirement OMA-MWG-2005-0054-CR-Clarification-R151 Reflects the agreement on deleting the section of Overall System Requirements. Reflects editorial corrrections
Candidate versions OMA-RD-MsgInterworking-V1_0-20050726-C	26 July 2005	n/a	Status changed to Candidate by TP TP ref # OMA-TP-2005-0228-Messaging-Services-Interworking-RD-for-approval New template used: OMA-Template-ReqDoc-20050506-I.

© 2005 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms as stated in this document.