OMA SIMPLE IM to OMA CPM transition guidelines

Version 1.1

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1 Introduction

Rich Communication Services (RCS) based profiles are no longer defined on regional level but globally. The RCS Universal Profile definition has become a reality that will allow reducing the variation of implementations and simplifying large scale deployments. This document aims to provide guidance both for client implementations i.e. Original Equipment Manufacturers (OEMs) or Operating System (OS) developers and Service providers in order to gradually transit from joyn profile compliance to RCS Universal Profile 1.0 compliance taking into account both service continuity and backward compatibility. The main driver of the document is the change of the Chat messaging technology from OMA SIMPLE IM towards OMA CPM.

1.1 Purpose of the document and scope

The transition guidelines defined in this document provide clarifications and requirements for clients and networks to support the transition from the joyn RCS profiles

- "Blackbird" as defined in [RCC.60],
- "Crane Priority Release" as defined in Annex B of [RCC.62]

towards the RCS Universal Profile version 1.0 as defined in [RCC.71] including the [RCS Universal Implementation Guidelines].

1.1.1 Structure of the document

This document details on transition procedures and includes technical specification references and details for the OEMs or OS developers and network suppliers, creating a transition guide.

- Chapter 2 includes the main Messaging Technology Selection Procedures and interfaces as defined for the purpose of this document
- Chapter 3 covers the technical procedures required to be fulfilled for the transition of the UNI interface towards the RCS Universal Profile 1.0.
- Chapter 4 covers the technical procedures required to be fulfilled for the transition of the NNI interface towards the RCS Universal Profile 1.0.
- Chapter 5 describes the main phases and dependencies for the transition.

1.2 Definition of Terms

Term	Description
B2BUA	Back to Back User Agent
CPM	Converged IP Messaging
HTTP	Hyper Text Transfer Protocol
IM	Instant/Immediate Messaging
MSRP	Message Session Relay Protocol
NNI	Network to Network Interface
OEM	Original Equipment Manufacturer
OMA	Open Mobile Alliance

Term	Description
B2BUA	Back to Back User Agent
CPM	Converged IP Messaging
HTTP	Hyper Text Transfer Protocol
IM	Instant/Immediate Messaging
MSRP	Message Session Relay Protocol
OS	Operating System
RFC	Request for Comments
RCS	Rich Communication Services
SIMPLE	SIP Instant Message and Presence Leveraging Extensions
SIP	Session Initiation Protocol
TE	Technical Enabler
UNI	User to Network Interface

1.3 Table of references

Ref	Document Number	Title
1	[RCC.71]	GSMA PRD RCC.71 RCS Universal Profile Service Definition Document, Version 1.0, 16 November 2016 http://www.gsma.com/
2	[RCS-CPM-CONVFUNC-ENDORS]	GSMA PRD RCC.11 RCS 6.0 Endorsement of OMA CPM 2.1 Conversation Functions, Version 5.0, 21 March 2016 http://www.gsma.com/
3	[RCS-CPM-IW-ENDORS]	GSMA PRD RCC.10 RCS 6.0 Endorsement of OMA CPM 2.1 Interworking, Version 5.0, 21 March 2016 http://www.gsma.com/
4	[RCS-SIMPLE-IM-ENDORS]	GSMA PRD RCC.12 RCS 6.0 Endorsement of OMA SIP/SIMPLE IM 2.0, Version 5.0, 21 March 2016 http://www.gsma.com/
5	[PRD-IR.90]	GSMA PRD IR.90 - “RCS Interworking Guidelines”, Version 13.0, 6 May 2016 http://www.gsma.com/
6	[CPMCONVFUNC]	CPM Conversation Functions, Open Mobile Alliance Ltd. OMA-TS-CPM_Conv_Fnct-V2_1-20160209-C http://member.openmobilealliance.org/ftp/Public_documents/COM/COM-CPM/Permanent_documents/OMA-TS-CPM_Conversation_Function-V2_1-20160209-C.zip
7	[CPMIW]	CPM Interworking Function, Open Mobile Alliance Ltd. OMA-TS-CPM_Interworking-V2_1-20160209-C http://member.openmobilealliance.org/ftp/Public_documents/COM/COM-CPM/Permanent_documents/OMA-TS-CPM_Interworking_Function-V2_1-20160209-C.zip

Ref	Document Number	Title
8	[RCC.07]	GSMA PRD RCC.07 “Rich Communication Suite 6.0 Advanced Communications Services and Client Specification”, Version 7.0, 21 March 2016 http://www.gsma.com/
9	[RCC.14]	GSMA PRD RCC.14 Service Provider Device Configuration, Version 3.0, 21 March 2016 http://www.gsma.com/
10	[RCC.60]	GSMA PRD RCC.60 joyn Blackbird Product Definition Document, Version 5.0, 17 August 2015 http://www.gsma.com/
11	[RCC.62]	GSMA PRD RCC.62 joyn Crane Product Definition Document, Version 3.0, 20 February 2016 http://www.gsma.com/
12	[RFC3326]	The Reason Header Field for the Session Initiation Protocol (SIP), IETF RFC http://tools.ietf.org/html/rfc3326
13	[RFC4975]	The Message Session Relay Protocol (MSRP), IETF RFC http://tools.ietf.org/html/rfc4975
14	[RFC6135]	Alternative Connection Model for the Message Session Relay Protocol (MSRP), IETF RFC http://tools.ietf.org/html/rfc6135
15	[RFC6714]	Connection Establishment for Media Anchoring (CEMA) for the Message Session Relay Protocol (MSRP), IETF RFC http://tools.ietf.org/html/rfc6714
16	[RCS Universal Implementation Guidelines]	GSMA PRD RCC.72 RCS Universal Profile Corrections and Clarifications http://www.gsma.com/

2 Messaging Technology Selection Procedures

This section defines the main procedures for the selection of technologies for the transition from OMA SIMPLE IM to OMA CPM

2.1.1 Interfaces

The selection of technology is different for the User-Network Interface (UNI) and the Network-Network Interface (NNI). Based on the functional architecture of OMA SIMPLE IM and OMA CPM the following topology of interfaces need to be considered for the transition.

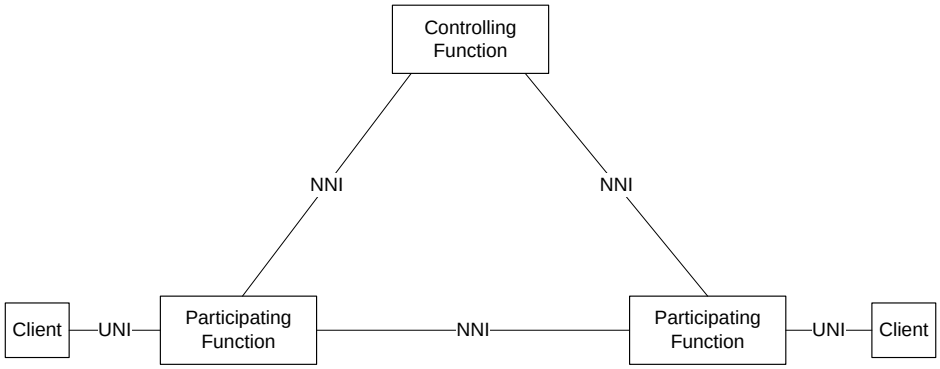

Figure 1: Interface Topology

2.1.2 Transition for the UNI

There is only one chat messaging technology used by a single client, i.e. either OMA CPM or OMA SIMPLE IM. The technology is selected by the Service Provider based on the chat messaging technologies supported by the client and the network.

If the client acts as an OMA CPM client as per Service Provider policy, then the network shall follow the procedures defined for the OMA CPM Participating Function in [RCS-CPM-CONVFUNC-ENDORS] towards the client.

If the client acts as an OMA SIMPLE IM client as per Service Provider policy, then the network shall follow the procedures defined for the OMA SIMPLE IM Participating Function in [RCS-SIMPLE-IM-ENDORS] towards the client.

2.1.3 Transition for the NNI

The transition for the NNI is based on the usage of only one chat messaging technology for a single interconnection between two operators at a time. The chat messaging technology is selected by the respective operators based on bi-lateral agreement.

The procedures for the selection of the chat messaging technology on the NNI need to take the following relations of functions into account.

Participating Function and Participating Function:

The interconnected networks shall act either as a CPM Participating Function as defined in [RCS-CPM-CONVFUNC-ENDORS] or as a Participating IM Function as defined in [RCS-SIMPLE-IM-ENDORS] towards each other.

The network with a Participating Function selects the chat messaging technology based on the network identifier of the recipient user when establishing a connection towards the Participating Function in the interconnected network.

Controlling Function and Participating Function:

The interconnected networks shall act either as a CPM Participating Function and CPM Controlling Function as defined in [RCS-CPM-CONVFUNC-ENDORS] or as a Participating IM Function and Controlling IM Function as defined in [RCS-SIMPLE-IM-ENDORS] towards each other.

The network with the Participating Function selects the chat messaging technology based on the network identifier of the Group Chat session ID when establishing a connection towards the Controlling Function in the interconnected network.

The network with the Controlling Function selects the chat messaging technology based on the network identifier of the recipient when establishing a connection towards the Participating Function in the interconnected network. As clarified in section 4, the network entity acting as a Participating Function or as a Controlling Function may be the function itself or an Interworking Function.

For services using MSRP (Message Session Relay Protocol) transport not being OMA CPM or OMA SIMPLE IM but covered in this document, the same principles for the selection of the interface technology apply.

For the NNI, the scope of document is limited to scenarios where the NNI is between Service Providers. For the interfaces within a Service Provider the same principles can be used.

3 UNI transition towards RCS Universal profile 1.0

3.1 Introduction

The transition from the joyn profiles referred to in section 1.1. towards the Universal Profile 1.0 is phased as follows:

- Phase 1
  clients support the service definitions of the RCS Universal Profile 1.0 based on a reduced set of technical enablers of the Universal Profile and with OMA SIMPLE IM as chat messaging technology instead of OMA CPM.
- Phase 2
  clients support the service definitions of the RCS Universal Profile 1.0 based on all the technical enablers of the Universal Profile and with OMA SIMPLE IM as chat messaging technology in addition to OMA CPM.

The transition is completed if clients and networks support the RCS Universal Profile 1.0 only based on the technical enablers of the profile.

Clients and networks shall support the additional clarifications and requirements in the relevant phases as defined in the following sections.

3.2 Device Provisioning

The definitions of section 2.3 of [RCC.71] apply with the following additional clarifications and requirements.

3.2.1 Procedures in the Configuration Server

Configuration Servers shall disable a client, if the configuration request contains an unsupported value in the "provisioning_version" parameter defined in section 2 of [RCC.14] by returning a 403 forbidden status response following the definition of section 2.2.4 of [RCC.14].

Configuration Servers shall disable a RCS client, if the configuration request contains

- an "rcs_profile" parameter defined in section 2.3.3.2 of [RCC.07] with an unsupported value, or
- the "rcs_version" parameter defined in section 2.3.3.2 of [RCC.07] with an unsupported value.

To disable the RCS client, the configuration server shall return

- a 403 forbidden status response following the definition of section 2.2.4 of [RCC.14], if no other service is configured as result of the request processing, or
- a configuration xml document containing a RCS DISABLED STATE parameter with value "0" following the definitions in section 2.3.3.2.1 of [RCC.07], if a non RCS service is configured as result of the request processing.

3.2.2 Configuration Request Parameters

The definitions for the "rcs_profile" configuration request parameter in section 2.3.1.1 of [RCC.71] are replaced in by the following for the phases of transition defined in section 3.1:

- Clients supporting the transition guidelines and conforming to the phase 1 of transition shall not add the "rcs_profile" parameter defined in section 2.3.1.1 of [RCC.71].
  Instead the client shall add an "rcs_profile" parameter with the value set to "UP_T".
- Clients supporting the transition guidelines and conforming to the phase 2 of transition shall add the "rcs_profile" parameter defined in section 2.3.1.1 of [RCC.71]. In addition the client shall add an "rcs_profile" parameter with the value set to "UP_T".

3.3 Capability Discovery and Service Availability

3.3.1 Overview

The definitions of section 3.3 of [RCC.71] apply with the following additional clarifications and requirements.

The support of the technical enabler TE2 described in section 3.3.1 of [RCC.71] is not required for clients supporting the phase 1 of transition as defined in section 3.1.

A client supporting the phase 2 of transition as defined in section 3.1 shall support all technical enablers defined in section 3.3.1 of [RCC.71].

3.4 1-to-1 Messaging

The definitions of section 5.3 of [RCC.71] apply with the following additional clarifications and requirements.

3.4.1 Overview

For a client supporting the phase 1 of transition as defined in section 3.1 the following applies:

- The client shall implement the service definitions of section 5 of [RCC.71] related to the 1-to-1 messaging based on the OMA SIMPLE IM chat messaging technology as

defined in section 3.3 of [RCC.07] and the additional clarifications and requirements defined in this section.

- The client shall implement the service definitions of section 5 of [RCC.71] related to geolocation Push service based on the OMA SIMPLE IM chat messaging technology as defined in section 3.10 of [RCC.07] and the additional clarifications and requirements defined in this section.
- The support of the RCS Standalone messaging technology is not required for clients, i.e. the service definitions of
    - the 1-to-1 Messaging service is provided based on the service definitions of section 5 of [RCC.71] via the RCS 1-to-1 Chat service only.
    - the Geolocation push service is provided based on the service definitions of section 5 of [RCC.71] via the RCS 1-to-1 Chat service only.
    - the 1-to-Many Messaging service is provided based on the service definitions of section 5 of [RCC.71] via 1-to-1 Messaging services per single recipient only.

For a client supporting the phase 2 of transition as defined in section 3.1 the following applies:

- The implementation of the service definitions for 1-to-1 Messaging based on OMA CPM as defined in section 5.3 of [RCC.71].
- The implementation of the service definitions for 1-to-1 Messaging based on OMA SIMPLE IM as defined for phase 1.
- The implementation of the service definitions for Geolocation Push based on OMA CPM as defined in section 5.3 of [RCC.71].
- The implementation of the service definitions for Geolocation Push based on OMA SIMPLE IM as defined for phase 1.
- The implementation of the service definitions for 1-to-Many Messaging based on OMA SIMPLE IM as defined for phase 1.
- The implementation of the service definitions for 1-to-Many Messaging based on OMA CPM as defined in section 5.3 of [RCC.71].
- Only either OMA SIMPLE IM or OMA CPM is used by a single client. The selection is made through the CHAT MESSAGING TECHNOLOGY parameter as defined in section 3.9.
- The implementation of the RCS Standalone messaging technology

3.4.2 Technology Selection Rules

A client supporting either the phase 1 or the phase 2 of transition defined in section 3.1 shall apply the procedures for technology selection for the 1-to-1 Messaging service defined in section 5.3.3.1.1 of [RCC.71] with the following additional clarification and requirement.

If

- the RCS 1-to-1 Chat Messaging technology is selected, and
- OMA SIMPLE IM is selected as messaging technology, and
- the initiation of a RCS 1-to-1 Chat session fails with an 486 Busy Here response,

then the client shall not select an alternative technology (e.g. SMS or Standalone Messaging) to initiate the conversation. For example, this is to cover the case where the recipient network would not implement any of the delivery assurance mechanism defined in section 5.3.2 of [RCC.71] and in order to avoid reception of duplicated messages.

3.4.3 Chat Fallback Mechanism management

A client supporting either the phase 1 or the phase 2 of transition defined in section 3.1 shall apply the procedures for the Chat Fallback Mechanism management as defined in section 5.3.3.2 of [RCC.71] with the following additional clarifications and requirements.

If

- OMA SIMPLE IM is selected as messaging technology, and
- the client initiates a 1-to-1 Chat session, and
- the CHAT REVOKE TIMER client configuration parameter defined in section A.1.4.3 of [RCC.07] is set to a value higher than "0", and
- the SMS fall-back is not disabled on the client,

then the client shall monitor the delivery of the message that it sends in the SIP INVITE request.

If the client receives a SIP 200 OK response to the SIP INVITE, then

- if the contact header contains a message revocation feature tag as defined in section 5.3.2 of [RCC.71], then the client shall continue monitoring the delivery of the message sent in the SIP INVITE.
- if the contact header contains a network interworking feature tag as defined in section 5.3.2 of [RCC.71] then the client shall stop monitoring the delivery of the message in the SIP INVITE.
- if the contact header contains neither the network interworking feature tag nor the message revocation feature as defined in section 5.3.2 of [RCC.71], then the client shall stop monitoring the delivery of the message in the SIP INVITE.

If the client receives a 486 Busy Here response to the SIP INVITE, then the client shall stop monitoring the delivery of the message sent in the SIP INVITE.

3.4.4 Disposition Notifications

A client supporting either the phase 1 or the phase 2 of transition defined in section 3.1 shall apply the procedures for Disposition Notification as defined in section 5.3.3.4 of [RCC.71] with the following additional clarifications and requirements.

If the chat messaging technology OMA SIMPLE IM is selected and if the client sends a message in a CPIM/IMDN wrapper carried in a SIP INVITE request, then the client shall request in the CPIM Disposition-Notification header an Interworking Disposition Notification as defined in Appendix O of [RCS-CPM-CONVFUNC-ENDORS].

3.4.5 Chat message revocation

If the chat messaging technology OMA SIMPLE IM is selected, and a client supporting either the phase 1 or the phase 2 generates a Message Revoke request, section 5.3.5 of [RCC.71] applies with the following difference:

- For step 9, similar to section 8.1.1 of [RCS-SIMPLE-IM-ENDORS] for IMDNs, the client shall not include Conversation-ID nor Contribution-ID.

Similarly, for the MessageRevokeResponse request, the Messaging Server shall follow the procedures described in section 5.3.5 of [RCC.71] with the following difference:

- For step 8, similar to section 8.1.1 of [RCS-SIMPLE-IM-ENDORS] for IMDNs, the Messaging Server shall not include Conversation-ID nor Contribution-ID.

3.4.6 Sending queued messages when message is included in a SIP INVITE request

A client supporting either the phase 1 or the phase 2 of transition defined in section 3.1 and when the result of technology selection is OMA SIMPLE IM, shall, as per section 2.7.1.1 of [RCC.07], wait until a provisional response is received before sending a subsequent SIP INVITE request, except that the client shall not treat 100 Trying as a provisional response.

3.5 Group Chat

The definitions of section 6.3 of [RCC.71] apply with the following additional clarifications and requirements.

For a client supporting the phase 1 of transition as defined in section 3.1 the following applies:

- The client shall implement the service definitions of section 6 of [RCC.71] based on the OMA SIMPLE IM chat messaging technology as defined in section 3.4 of [RCC.07].

For a client supporting the phase 2 of transition as defined in section 3.1 the following applies:

- The client shall implement the service definitions of section 6 of [RCC.71] based on the OMA CPM chat messaging technology defined in section 6.3 of [RCC.71].
- The client shall implement the service definitions of section 6 of [RCC.71] based on the OMA SIMPLE IM chat messaging technology as defined in section 3.4 of [RCC.07].
- Only either OMA SIMPLE IM or OMA CPM is used by a single client. The selection is made through the CHAT MESSAGING TECHNOLOGY parameter as defined in section 3.9.

3.6 File Transfer

The definitions of section 7.3 of [RCC.71] apply with the following additional clarifications and requirements.

The File Transfer via HTTP makes use of 1-to-1 Chat, Group Chat or Standalone Messaging to convey the location of a file in accordance with the definitions in section 3.5.4.8 of [RCC.07]. The definitions for technology selection defined in section 3.4 and 3.5 of this document apply for transport of File Transfer via HTTP.

3.7 Enriched Voice Calling

The definitions of section 12.5, 12.7 and 12.9 of [RCC.71] apply with the following additional clarifications and requirements.

In accordance with the definitions of section 3.10.4.1.1.1 of [RCC.07] the Geolocation Push service during a call is implemented using File Transfer via MSRP. For a client supporting the phase 1 of transition as defined in section 3.1 the following applies:

- The client shall implement the service definitions of section 12.6.5 of [RCC.71] using File Transfer via MSRP based on the OMA SIMPLE IM chat messaging technology as defined in section 3.5 of [RCC.07].

For a client supporting the phase 2 of transition as defined in section 3.1 the following applies:

- The client shall implement the service definitions of section 12.6.5 of [RCC.71] using File Transfer via MSRP based on the OMA CPM chat messaging technology defined in section 3.5 of [RCC.71].
- The client shall implement the service definitions of section 12.6.5 of [RCC.71] using File Transfer via MSRP based on the OMA SIMPLE IM chat messaging technology as defined in section 3.5 of [RCC.07].

3.7.1 MSRP Session Setup for Enriched Calling

As described in section 2.8.2 of [RCC.07], a client shall determine which procedures to use for MSRP session setup based on the value of the CHAT MESSAGING TECHNOLOGY client configuration parameter. This applies to all services that require the use of MSRP and thus also to Enriched Calling.

3.8 Client updates

To speed up the transition to OMA CPM, it is recommended that the client supporting the phase 1 of the transition defined in section 3.1 could be updated to support the phase 2 of the transition defined in section 3.1.

In that case, a client supporting the phase 1 of the transition could be updated to support the phase 2 of the transition and shall be only compliant with the phase 2 of the transition after this update.

A client supporting the phase 2 of the transition could be updated to support only the Universal Profile 1.0 and future releases; and shall be only compliant with the targeted Universal Profile release after this update.

3.9 Configuration Parameters

For clients supporting either the phase 1 or the phase 2 of the transition defined in section 3.1 the configuration parameters defined in Annex C of [RCC.71] apply with the following

additional clarifications and requirements. Table 1 provides an overview of configuration parameters modified for the phase 1 or phase 2 of transition as defined in section 3.1.

Parameter	Client Configurability in Phase 1	Aligned Value for Phase 1	Client Configurability in Phase 2	Aligned Value for Phase 2
CHAT MESSAGING TECHNOLOGY	Fixed Value "0"		Service Provider Configurable	
STANDALONE MSG AUTH	Fixed Value "0"		as defined in Annex C of [RCC.71]	
CAPABILITY DISCOVERY MECHANISM	Fixed Value "0"		as defined in Annex C of [RCC.71]	

Table 1: Modified Configuration Parameter definitions

4 NNI transition towards RCS Universal Profile 1.0

The procedures defined in section 6.5 of [CPMIW], Appendix G of [CPMCONVFUNC] and section 4.3.3 of [PRD-IR.90] apply with the additions and clarifications included in this section.

Based on section 6.5 of [RCS-CPM-IW-ENDORS], there are two models of interworking:

- CPM Transition
- NNI interworking

4.1 Endorsement of Appendix G of [RCS-CPM-CONVFUNC-ENDORS]

Both models are based on a mapping between OMA SIMPLE IM and OMA CPM. For OMA SIMPLE IM to OMA CPM the procedures defined in Appendix G of [RCS-CPM-CONVFUNC-ENDORS] apply. The differences defined in [RCS-CPM-CONVFUNC-ENDORS] are replaced with the following differences:

- User-Agent header value of the outgoing SIP request shall conform to the definitions of the chat technology.
- Server header value of the outgoing SIP response shall conform to the definitions of the chat technology.
- In Note 2, the case for IM Messages, CPM Standalone Messages and Standalone Message disposition notifications are not applicable.
- Note 3 is not applicable.
- In Table 5, SIMPLE IM Pager Mode and SIMPLE IM Large Message Mode are not applicable.

4.2 Endorsement of section 4.3.3 of [PRD-IR.90]

The procedures defined in section 4.3.3 of [PRD-IR.90] apply with the additions and clarifications of this section.

For section 4.3.3.1 of [PRD-IR.90]:

- Table 2 and Table 3 of [PRD-IR.90] are replaced with the following tables, Table 2 and Table 3:

RCS Service	OMA SIMPLE IM	OMA CPM	Comment
Chat, Group Chat	In Contact header of SIP INVITE, REFER and SUBSCRIBE requests and in Accept-Contact header of SIP INVITE and SUBSCRIBE requests, and in Accept-Contact header of SIP MESSAGE request carrying an IMDN or Message Revocation: +g.oma.sip-im	In Contact header of SIP INVITE, REFER and SUBSCRIBE requests and in Accept-Contact header of SIP INVITE and SUBSCRIBE requests, and in Accept-Contact header of SIP MESSAGE request carrying an IMDN or Message Revocation: +g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.oma.cpm.session"	Feature tag mapping Message Revocation does not apply to Group Chat
Chat	when P-Asserted-Service is not present for a SIP INVITE request For aSIP MESSAGE request carrying an IMDN or Message Revocation related to a Chat when a Contribution-ID is not present, and when P-Asserted-Service is not present	P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session	P-Asserted-Service mapping: If OMA SIMPLE IM SIP request contains a P-Asserted-Service header field, the header and value are copied over to the OMA CPM SIP request
Group Chat	when P-Asserted-Service is not present for SIP INVITE and SUBSCRIBE and REFER requests For SIP MESSAGE request carrying IMDN when a Contribution-ID is present, and when P-Asserted-Service is not present	P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session.group	P-Asserted-Service mapping: If OMA SIMPLE IM SIP request contains a P-Asserted-Service header field, the header and value are copied over to the OMA CPM SIP request

RCS Service	OMA SIMPLE IM	OMA CPM	Comment
File Transfer using MSRP	In Contact and Accept-Contact headers of SIP INVITE: +g.oma.sip-im	In Contact and Accept-Contact headers of SIP INVITE requests: +g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.oma.cpm.filetransfer"	Feature tag mapping The File Transfer using MSRP service is only used for Geolocation Push during a call (section 3.10.4.1.1 of [RCC.07]). No IMDNs are requested for File Transfer using MSRP since store and forward of File Transfer is not supported.
File Transfer using MSRP	when P-Asserted-Service is not present in SIP INVITE	In P-Asserted-Service: urn:urn-7:3gpp-service.ims.icsi.oma.cpm.filetransfer”	P-Asserted-Service mapping: If OMA SIMPLE IM SIP request contains a P-Asserted-Service header field, the header and value are copied over to the OMA CPM SIP request The File Transfer using MSRP service is only used for Geolocation Push during a call (section 3.10.4.1.1 of [RCC.07]).
Chat, Group Chat, File Transfer using MSRP	Contribution-ID mandatory for SIP INVITE and SIP REFER and SIP MESSAGE carrying IMDN for Group Chat not present for SIP SUBSCRIBE and SIP MESSAGE carrying IMDN for Chat or Message Revocation	Contribution-ID and Conversation-ID - mandatory for SIP INVITE, REFER and SIP MESSAGE carrying IMDN or Message Revocation - not present for SIP SUBSCRIBE	For SIP INVITE, SIP REFER and SIP MESSAGE when Contribution-ID is present copy the Contribution-ID header in the OMA SIMPLE IM SIP request into the Conversation-ID and Contribution-ID headers in the OMA CPM SIP request. For SIP MESSAGE when Contribution-ID is not present, generate a new unique Conversation-ID created as per the rules of section C.1.1 in [RCS-CPM-CONVFUNC-ENDORS]. For IMDNs, as per section 5.4.3 in the [RCS-CPM-CONVFUNC-ENDORS], the recipient client shall find the associated sent message using the Message-ID included in the IMDN, and not using the Conversation-ID/Contribution-ID which will not match. Populate the value of the Conversation-ID header field into the Contribution-ID header in the OMA CPM SIP request.
Chat, Group Chat, File Transfer	InReplyToContribution-ID (if present)	InReplyToContribution-ID (optional)	If an InReplyToContribution-ID is not present in the OMA SIMPLE IM SIP request, the node doing the mapping should not create one.

RCS Service	OMA SIMPLE IM	OMA CPM	Comment
using MSRP			
Chat, Group Chat, File Transfer using MSRP	All other headers	All other headers, values and parameters are copied without change except for changes required to allow the node doing the mapping to insert itself in the media path	
Chat, Group Chat, File Transfer using MSRP	SDP body	The SDP body is copied without change except for changes required to allow the node doing the mapping to insert itself in the media path and optionally changes to deal with differences in the MSRP session matching	Changes to deal with the differences in MSRP session matching are described in section 4.4.1 and are only required if the network elements at the network border do not handle the MSRP as Back-to-Back user agents
Group Chat	SIP REFER request	SIP REFER request inside the SIP dialog (mandatory)	If the SIP REFER request for OMA SIMPLE IM is outside the dialog, ensure that the SIP REFER request is sent inside the dialog to which it belongs for OMA CPM

Table 2: OMA SIMPLE IM to OMA CPM mapping for all RCS service related SIP requests and responses

RCS Service	OMA CPM	OMA SIMPLE IM	Comment
Chat, Group Chat	In Contact header of SIP INVITE, REFER, and SUBSCRIBE requests and in Accept-Contact header of SIP INVITE and SUBSCRIBE requests, and in Accept-Contact header of SIP MESSAGE request carrying an IMDN or Message Revocation: +g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.oma.cpm.session"	In Contact header of SIP INVITE, REFER and SUBSCRIBE requests and in Accept-Contact header of SIP INVITE and SUBSCRIBE requests, and in Accept-Contact header of SIP MESSAGE request carrying an IMDN or Message Revocation: +g.oma.sip-im	Feature tag mapping Message Revocation does not apply to Group Chat

RCS Service	OMA CPM	OMA SIMPLE IM	Comment
File Transfer using MSRP	In Contact and Accept-Contact headers of SIP INVITE requests: +g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.oma.cpm.filetransfer"	In Contact and Accept-Contact headers of SIP INVITE requests: +g.oma.sip-im	Feature tag mapping The File Transfer using MSRP service is only used for Geolocation Push during a call (section 3.10.4.1.1 of [RCC.07]). No IMDNs are requested for File Transfer using MSRP since store and forward of File Transfer is not supported.
Group Chat	Referred-By with more than one URI	Referred-By with only one URI, with preference for TEL URI if present	As the OMA SIMPLE IM TS [RCS-SIMPLE-IM-ENDORS] does not require support for more than one value in the Referred-By header, the recipient's network might not allow more than one URI in this header. The node doing the mapping thus is required to leave only one value in this header, preferably the TEL URI if present.
Chat, Group Chat, File Transfer using MSRP	Contribution-ID and Conversation-ID - mandatory for SIP INVITE, REFER and SIP MESSAGE carrying IMDN or Message Revocation - not present in SIP SUBSCRIBE	Contribution-ID - mandatory for SIP INVITE, SIP REFER and SIP MESSAGE carrying an IMDN for Group Chat - shall not be present for SIP MESSAGE carrying an IMDN for Chat or Message Revocation. - shall not be present for SIP SUBSCRIBE	For all SIP requests other than SIP MESSAGE carrying an IMDN for Chat or Message Revocation, copy the Contribution-ID header in the OMA CPM SIP request into the Contribution-ID header in the OMA SIMPLE IM SIP request. This may result in reuse of Contribution-ID for Chat in an OMA SIMPLE IM network if such reuse occurred in the OMA CPM network. For SIP MESSAGE carrying an IMDN for Chat or Message Revocation, Contribution-ID shall not be added. Conversation-ID shall not be added to SIP Requests in OMA SIMPLE IM.
Chat, Group Chat, File Transfer using MSRP	All other headers	All other headers, values and parameters are copied without change except for changes required to allow the node doing the mapping to insert itself in the media path	
Chat, Group Chat, File	SDP body	SDP body is copied without change except for changes required to allow	Changes to deal with the differences in MSRP session matching are described

RCS Service	OMA CPM	OMA SIMPLE IM	Comment
Transfer using MSRP		the node doing the mapping to insert itself in the media path and optionally changes to deal with differences in the MSRP session matching	in [RCS-CPM-CONVFUNC-ENDORS] section 4.4.1

Table 3: OMA CPM to OMA SIMPLE IM mapping for all RCS service related SIP requests and responses

Section 4.3.3.3.4 of [PRD-IR.90] applies with the clarification that interworking of first message in an OMA SIMPLE IM INVITE is always required. For handling of first message in OMA SIMPLE IM INVITE, refer to the endorsement below of sections 4.3.3.3.5.1 and 4.3.3.3.5.2 of [PRD-IR.90].

For 1-to-1 chat originating on the OMA SIMPLE IM side i.e. Accept-Contact header includes +g.oma.sip-im, section 4.3.3.3.5.1 of [PRD-IR.90] applies with the following clarifications:

- The first sentence applies with the clarification that in order to identify whether interworking of first message in SIP INVITE request is required, the interworking function shall check for P-Asserted-Service set to urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session, or for content-type set to multipart/mixed and one of the parts contains content-type set to message/CPIM in SIP INVITE request.
- Step 1 applies.
- Step 2 does not apply. Instead the service provider shall wait for a SIP response to the CPM SIP INVITE request.
- Step 3 does not apply since the messages are not sent as Pager Mode CPM Standalone Messages.
- The optional handling to interwork to legacy message does not apply.
- The optional waiting before sending as Pager Mode CPM Standalone Message does not apply since messages are not sent as Pager Mode CPM Standalone Message.
- For the procedures on receiving a SIP 200 OK response from the CPM side, the temporarily queued message from the INVITE is sent via MSRP towards the recipient. Upon receiving an MSRP 200 OK from the CPM side for the temporarily queued message from the INVITE, an OMA SIMPLE IM SIP 200 OK is sent towards the OMA SIMPLE IM user. Upon receiving an MSRP error response, Table 4 below lists the mappings to the appropriate SIP error response to be sent towards the OMA SIMPLE IM user. As well, a SIP BYE request shall be sent to the CPM side including a Reason Header field as defined in [RFC3326] with a protocol-value set to MSRP and a protocol cause set to the value of the MSRP error response received.

MSRP error received from OMA CPM side	SIP error response sent towards OMA SIMPLE IM side	Comment
400	400	
403	403	

MSRP error received from OMA CPM side	SIP error response sent towards OMA SIMPLE IM side	Comment
408	408	
413	603	
415	415	
501	501	
Any other error received (e.g., 423, 481, 506)	500	SIP 500 error response is used so the SIMPLE IM user will send a new SIP INVITE request with the same message

Table 4: MSRP error response mapping to OMA SIMPLE IM SIP error response

- For the procedures on receiving an error response, the error response is propagated towards the originating OMA SIMPLE IM user, and the temporarily queued message is discarded and not sent as a CPM Standalone Message, nor as a legacy message.
- The Note about extending a 1-to-1 chat session into a Group Chat does not apply.
- The procedures for handling a SIP INVITE request when there is already an ongoing chat session with the same sender and recipient do not apply.

For 1-to-1 chat originating on OMA CPM side i.e. Accept-Contact header includes urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session, section 4.3.3.3.5.2 of [PRD-IR.90] applies with the following clarifications:

- The first sentence applies with the clarification that in order to identify that interworking of first message in SIP INVITE request is required, the interworking function shall check for P-Asserted-Service set to urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session.
- For the first bullet, when automatically accepting the session on behalf of the recipient, instead of only text/plain as allowed media, include all the content-types listed in section 3.3.4.2 of [RCC.07]. In addition, include a feature tag indicating the network support for chat fallback as per section 5.3.2 of [RCC.71] on behalf of the terminating network depending on service provider policy and inter-operator agreement.
- For the second bullet, bullet a) does not apply, since the MSRP 200 OK will not be sent until a response is received for the SIP INVITE request.
- The SIP 200 OK response procedures apply with the addition that the MSRP 200 OK is sent once the response is received for the SIP INVITE request.
- The SIP error response procedures apply with the addition that an MSRP 481 error response shall be sent when an error response other than SIP 486 error response is received for the SIP INVITE request, and an MSRP 200 OK response shall be sent when a SIP 486 Busy Here error response is received. When a SIP error response other than 486 Busy Here is received, a SIP BYE request shall be sent to the CPM side including a Reason Header field as defined in [RFC3326] with a protocol-value set to SIP and a protocol cause set to the value of the SIP error response received.
- The Note about extending a 1-to-1 chat session into a Group Chat does not apply.

- The procedures for handling a SIP INVITE request when there is already an ongoing chat session with the same sender and recipient do not apply.

Section 4.3.3.3.5.2.1 does not apply.

Section 4.3.3.3.6 of [PRD-IR.90] does not apply, and instead the principles in section 2 apply and the header mapping in section 4.3.3.1 of [PRD-IR.90] with the clarifications earlier in this section apply for disposition notifications and message revocation.

Section 4.3.3.4.2 of [PRD-IR.90] does not apply, and instead the principles in section 2 apply and the header mapping in section 4.3.3.1 of [PRD-IR.90] with the clarifications earlier in this section apply for disposition notifications

Section 4.3.3.5 File Transfer of [PRD-IR.90] applies for File Transfer via MSRP and is applicable only for the in-call Geolocation Push during a call service (section 3.10.4.1.1 of [RCC.07]).

Section 4.3.3.5.1 of [PRD-IR.90] does not apply, and instead the principles in section 2 apply and the header mapping in section 4.3.3.1 of [PRD-IR.90] with the clarifications earlier in this section apply for disposition notifications.

4.3 Chat Fallback Mechanism Management

When handling a SIP INVITE for a 1-to-1 chat session in the terminating network as defined in section 5.3.4.1 of [RCC.71] and OMA SIMPLE IM is selected as chat messaging technology, then the mapping of the responses received on the terminating leg to a 486 Busy Here response sent on the originating leg in a Messaging Server supporting store and forward as defined in section 3.3.4.2 of [RCC.07] do not apply. Instead the network shall map the SIP INVITE response received on the terminating leg to a 200 OK response indicating the applicable network fallback support capability. The 200 OK response shall include in the SDP *a=accept-wrapped-types* all the content-types listed in section 3.3.4.2 of [RCC.07].

4.4 MSRP Session Setup

As described in section 2, for each UNI and NNI transaction the technology selected shall comply with either OMA SIMPLE IM or OMA CPM. This includes the procedures for establishing MSRP sessions over that interface as defined in the corresponding service specifications and in section 2.8.2 of [RCC.07]. This means that

- If the technology selected is OMA SIMPLE IM, the TCP session set up shall be according to [RFC4975] and [RFC6135] while sessions will be matched at MSRP level according to the procedure described in section 2.8.2 of [RCC.07] and section 5.2.1.4.1 of [RCS-CPM-CONVFUNC-ENDORS]
- If the technology selected is OMA CPM, the TCP session set up shall be according to [RFC6714] and [RFC6135] and the session shall be matched at MSRP level according to [RFC4975].

Any element functioning as a MSRP B2BUA that handles both OMA SIMPLE IM and OMA CPM sessions shall behave as described in section 4.4.1.

Elements on the UNI and NNI responsible for topology hiding (e.g. SBCs) that are not functioning as MSRP B2BUAs shall ensure that they modify the SDP in the SIP INVITE and 200 OK responses according to the procedures required to support the session setup and matching algorithms of the corresponding protocol:

- For OMA SIMPLE IM sessions such network elements shall modify the IP address and port information in the c-, m- and a=path lines of the SDP.
- For OMA CPM sessions, only the c- and m-lines shall be modified and the a=path line shall be passed through unchanged.

A network element performing the procedures above that is not service aware, shall determine the required handling based on the 'msrp-cema' attribute in the SDP that will be present if the behaviour required for OMA CPM sessions is desired and absent if the behaviour linked to OMA SIMPLE IM is expected.

4.4.1 Interworking between MSRP Session Setup Procedures

Interworking between the procedures described in section 4.3 will require a combined SIP/MSRP Back-to-Back User Agent (B2BUA) in the network. This B2BUA shall:

- During the setup of the SIP session
    - provide the "msrp-cema" attribute in the SDP on the leg where that is required
    - Otherwise, behave as defined in section 5.2.1.4 of [RCS-CPM-CONVFUNC-ENDORS]
- During the MSRP session setup behave as follows:
    - wait for the active party to initiate the MSRP session setup,
    - accept the incoming TCP session,
    - perform the matching of the MSRP URI in the To-Path as per the procedures on the leg where the request was received or
    - if before matching the leg cannot be identified, match based on the Session-ID part of the URI only as defined in section 5.2.1.4.1 of [RCS-CPM-CONVFUNC-ENDORS]
    - Once matched initiate the TCP connection setup on the other leg as per the procedures on that leg and
    - send an empty MSRP SEND request on that leg as per [RFC4975]
- Once the MSRP session is established, pass through all MSRP requests and responses unchanged apart from the MSRP From and To headers that shall be modified to correspond to the URIs negotiated on the leg where the request or response is sent.

4.4.2 Other Services using MSRP

The same principle as the one described in section 3.7.1 for the UNI shall be followed on the NNI between two networks. If the interworking agreement is to use OMA CPM-based messaging, the procedures for MSRP session setup in OMA CPM sessions shall apply for all services requiring MSRP making use of that NNI. If the interworking agreement is to use

OMA SIMPLE IM-based messaging, the procedures for MSRP session setup in OMA SIMPLE IM sessions shall apply for all services requiring MSRP making use of that NNI.

This and what is described in section 3.7.1 means that for any service that requires the use of MSRP, interworking between the two procedures for MSRP Session setup could be required. When required, this interworking shall be done with a B2BUA as described in section 4.4.1.Other than the services described in [RCC.71] on the NNI between two networks, this applies also to Image Share as described in [RCC.07] section 3.6 if the service providers agree to allow Image Share over that interface next to the services provided as part of [RCC.71]. This could be relevant when service providers agree to update an existing NNI from OMA SIMPLE IM to OMA CPM while keeping the Image Share service available for use between subscribers using legacy clients (i.e. prior to the Universal Profile). In that case both networks will have to deploy a B2BUA as described in section 4.4.1 for Image Share to perform the interworking between the MSRP Session setup procedures.

5 Transition timelines

The diagram below shows the relationship between the network of an MNO and the type of clients it would support according to its capabilities with respect with the transition.

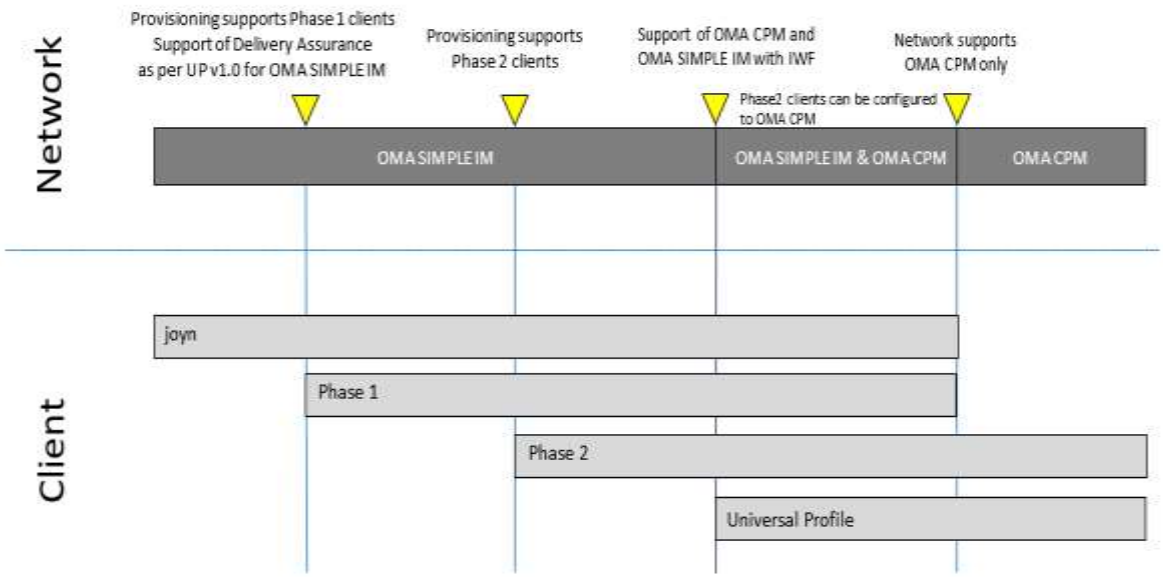

Figure 2: Transition Timelines

Annex A Document management

A.1 Document History

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
1.0	25/01/2017	Initial document approved by PSMC	PSMC	Ioanna Chatzicharistou / Vodafone
1.1	16/05/2018	Applied CR 1002 adding clarifications in sections 3.4.3, 3.4.4 and 4.2	TG	Tom Van Pelt / GSMA

A.2 Other Information

Type	Description
Document Owner	Network 2020 Programme, Global Specification Group
Editor / Company	Ioanna Chatzicharistou / Vodafone

It is our intention to provide a quality product for your use. If you find any errors or omissions, please contact us with your comments. You may notify us at prd@gsma.com

Your comments or suggestions & questions are always welcome.