Rich Communication Suite Endorsement of OMA CPM 2.2 Interworking

Version 9.0

16 October 2019

This is a Non-binding Permanent Reference Document of the GSMA

Security Classification: Non-confidential

Access to and distribution of this document is restricted to the persons permitted by the security classification. This document is confidential to the Association and is subject to copyright protection. This document is to be used only for the purposes for which it has been supplied and information contained in it must not be disclosed or in any other way made available, in whole or in part, to persons other than those permitted under the security classification without the prior written approval of the Association.

Copyright Notice

Copyright © 2019 GSM Association

Disclaimer

The GSM Association ("Association") makes no representation, warranty or undertaking (express or implied) with respect to and does not accept any responsibility for, and hereby disclaims liability for the accuracy or completeness or timeliness of the information contained in this document. The information contained in this document may be subject to change without prior notice.

Antitrust Notice

The information contain herein is in full compliance with the GSM Association's antitrust compliance policy.

Table of Contents

1 Introduction

1.1 Overview

This document describes which sections of the OMA Converged IP Messaging (CPM) 2.2 Interworking specification (see [CPMIW]) which are supported by the current version of RCS (Rich Communication Suite).

For details on how this fits in the scope of RCS please see [PRD-RCC.07].

For easier reference this document follows the same structure as [CPMIW]. For that reason the headings of the sections are citations of the headings used in [CPMIW], within the sections they describe what part the equivalent section in [CPMIW] is supported by RCS. For sections that are not applicable in their entirety, the description is at the top level of the section and the subsections are not mentioned thereafter. For sections in which no difference with [CPMIW] is introduced, the subsections state clearly that they are applicable.

This specification lists differences and clarifications for RCS compared to [CPMIW]. The former category includes both differences in expected behaviour compared to [CPMIW] as well as corrections in behaviour, which should disappear over time when bug fixes will be applied to [CPMIW]. The latter category describes what options are chosen for RCS, in case [CPMIW] provides multiple possibilities and provides clarifications on how the provided functionality is expected to be used.

1.2 Scope

This document provides the details of the interworking to SMS (Short Message Service) and MMS (Multimedia Messaging Service) used for the messaging technology in RCS. For SMS further details are provided in [29.311ENDORSE].

1.3 Definition of Terms

Term	Description
CPIM	Common Presence and Instant Messaging
CPM	Converged IP Messaging
ESME	External Short Message Entity
IM	Instant Messaging. The term chat is also applied in this document to the same concept.
IMDN	Instant Message Disposition Notification
IP	Internet Protocol
IP-SM-GW	IP Short Message Gateway
ISF	Interworking Selection Function
IWF	Interworking Function
MIME	Multipurpose Internet Mail Extensions
MMS	Multimedia Messaging Service
MSRP	Message Session Relay Protocol
OMA	Open Mobile Alliance

Term	Description
RCS	Rich Communication Suite
SDP	Session Description Protocol
SIMPLE	Session Initiation Protocol for Instant Messaging and Presence Leveraging Extensions
SIP	Session Initiation Protocol
SMPP	Short Message Peer to Peer protocol
SMS	Short Message Service
TCP	Transmission Control Protocol
URI	Uniform Resource Identifier

1.4 Document Cross-References

Ref	Document Number	Title
1.	[PRD-RCC.07]	GSMA PRD RCC.07 Rich Communication Suite - Advanced Communications: Services and Client Specification http://www.gsma.com/rcs/
2.	[CPMIW]	CPM Interworking, Open Mobile Alliance Ltd. OMA-TS-CPM_Interworking-V2_2-20170509-D http://member.openmobilealliance.org/ftp/Public_documents/COM/COM-CPM/Permanent_documents/OMA-TS-CPM_Interworking_Function-V2_2-20170509-D.zip
3.	[29.311ENDORSE]	GSMA PRD RCC.08 Rich Communication Suite Endorsement of 3GPP TS 29.311 Interworking for Messaging Services http://www.gsma.com/rcs/
4.	[CPMCONVENDORSE]	GSMA PRD RCC.11 RCS Endorsement of OMA CPM 2.2 Conversation Functions http://www.gsma.com/rcs/

2 References

See chapter 1.4 above.

3 Terminology and Conventions

The same conventions, terminology, definitions and abbreviations used in chapter 3 of [CPMIW] are valid for RCS. Additional abbreviations and terms specific for this document are in chapter 1.3.

4 Interworking

RCS supports the following in the area of interworking

- Interworking of Pager Mode and Large Message Mode CPM (Converged IP Messaging) Standalone Messages to and from SMS

- Interworking of Pager Mode and Large Message Mode CPM Standalone Messages to and from MMS
- Interworking of CPM 1-to-1 Sessions to SMS in the terminating network
- Interworking of disposition notifications

RCS does not support the following in the area of interworking:

- Interworking of CPM 1-to-1 sessions in the Originating Network
- Interworking of CPM sessions to MMS
- Interworking of CPM Group Sessions
- Interworking of File Transfer
- Interworking to and from e-mail
- Interworking with SIMPLE IM
- Interworking with non-CPM communication services other than SMS and MMS
- Interworking of CPM communication from CPM users not having an address that can be mapped to an E.164-based address (i.e. users for which no tel URI or SIP URI with user=phone parameter is provided)
  In this case a SIP 488 Not Acceptable Here error response will be returned.
- Interworking a CPM session with multiple media stream

RCS also doesn't support or make use of following CPM Concepts:

- The possibility for anonymous messages
  When receiving MMS messages requesting anonymity (i.e. with Sender visibility set to Hide), such messages shall not be interworked.
- The checking of the target user's preferred delivery mechanisms in XDMS in the terminating network
  RCS assumes implementation specific user preferences or operator policies that determine the legacy service selection
- Re-selection of an IWF (Interworking Function) in the ISF (Interworking Selection Function) if delivery through the original IWF results in an error response
- Asking a non-CPM user about whether or not to accept the CPM Session
  For RCS the IWF shall always accept the session on behalf of the non-CPM user and there shall be no possibility for the non-CPM user to leave the session given that it is always 1-to-1 communication.
- Informing a non-CPM user of the closing of a session
  The non-CPM user shall not be informed given because closing the session is only a technical event.
- Modification of established CPM Sessions
- The use of Message Session Relay Protocol (MSRP) Success Reports
  Such reports shall not be requested.
- The use of negative-delivery Instant Messaging Disposition Notifications (IMDN).
  Such reports shall not be requested and shall thus also not be generated.

No differences with [CPMIW] after taking into account the above use cases and technology choices for RCS.

4.1 CPM Version 1.0

Following differences with [CPMIW] after taking into account the use cases and technology choices for RCS that are described in section 4.

- The interworking selection process of the ISF (Interworking Selection Function) does not have to select a Non-CPM Communication Service for CPM File Transfers nor for CPM disposition notifications.

4.2 CPM Version 2.0

No differences with [CPMIW].

4.3 CPM Version 2.1

No differences with [CPMIW].

5 Procedures at Interworking Selection Function

No differences with [CPMIW].

5.1 Non-CPM Communication Service Selection

Following differences with [CPMIW] after taking into account the use cases and technology choices for RCS that are described in section 4:

- In step 1 checking the service provider policies is not applicable for RCS for standalone messages. When a request for interworking of a session is received, the MMS IWF will be excluded.
- In step 2 checking the service provider policies is not applicable for RCS for standalone messages. When a request for interworking of a session is received the MMS IWF will be excluded.
- In step 5
  - a text only CPM Standalone Message will be interworked to SMS up to a service provider configurable size limit;
  - Any other Standalone CPM message will be interworked to MMS;
  - A CPM session will be interworked to SMS.
- In step 6, for RCS service provider policy will never allow to select the IWF through part of the destination address

5.2 Interworking to a Long-lived CPM Group Session

Not applicable for RCS following the use cases and technology choices for RCS that are described in section 4

6 Procedures at Interworking Function

No differences with [CPMIW]

6.1 General Principles

No differences with [CPMIW] after taking into account the use cases and technology choices for RCS that are described in section 4.

6.1.1 Pager Mode CPM Standalone Message Handling

Following differences with [CPMIW] after taking into account the use cases and technology choices for RCS that are described in section 4:

- In step 1, for SMS any text content type will be acceptable for RCS, for MMS any content type that can be partly interworked to MMS, will be acceptable. In case parts of the content cannot be interworked to MMS, those parts will be discarded when relaying the CPM Standalone Message.

6.1.2 Large Message Mode CPM Standalone Message Handling

Following differences with [CPMIW] after taking into account the use cases and technology choices for RCS that are described in section 4:

- In step 1 of the handling of a received SIP INVITE request, for SMS any text content type will be acceptable for RCS, for MMS any content type that can be at least partly interworked to MMS will be acceptable. In case parts of the content cannot be interworked to MMS those parts will be discarded when relaying the Standalone message.
- For RCS, the IWF shall not respond the final MSRP SEND request without a response from the non-CPM Communication Service as both SMS and MMS should provide appropriate responses in all circumstances

6.1.3 CPM File Transfer Handling

Not applicable for RCS following the use cases and technology choices for RCS that are described in section 4

6.1.4 CPM Session Invitation Handling

Following differences with [CPMIW] after taking into account the use cases and technology choices for RCS that are described in section 4:

- In step 6 h, the SMS IWF shall remove the any Multipurpose Internet Mail Extensions (MIME) types different from text from the accept-types.

As a clarification for RCS:

- In step 1 of the handling of a received SIP INVITE request, for the SMS IWF a MSRP media stream without text mime types in accept-wrapped-types.
- When a new INVITE request is received for a 1-to-1 session from the initiator towards a non-CPM user that has accepted an earlier INVITE request from that initiator, but for which the session for that earlier request was not fully established yet, (that is no ACK request has been received yet) a SIP 600 response shall be sent to the new INVITE request.
- When a new INVITE request is received for a 1-to-1 session from the initiator towards a non-CPM user for whom there is an existing, fully established session with that initiator already a SIP 200 OK response shall be sent to accept the new INVITE request. Once the session is fully established, the IWF shall send a BYE request to

terminate the earlier session. Any messages received from the non-CPM user will be sent in the new session from then on.

6.1.5 CPM Session Modification Handling

Not applicable for RCS following the use cases and technology choices for RCS that are described in section 4. Subsection 6.1.5.1 is though.

6.1.5.1 CPM Session Media Handling

Following differences with [CPMIW] after taking into account the use cases and technology choices for RCS that are described in section 4:

- For RCS the reception of media from the non-CPM communication service will be positively acknowledged when an MSRP 200 OK response is received to the last chunk of the message. In case of an MSRP error or termination of the session prior to that, a negative acknowledgement will be sent.
- When receiving media in a 1-to-1 session, the CPIM From and To headers should be ignored
- When sending media in a 1-to-1 session, the CPIM From and To Headers should be set to “sip:anonymous@anonymous.invalid”.

6.1.6 CPM Session Leaving

6.1.6.1 CPM Initiated

No differences with [CPMIW] after taking into account the use cases and technology choices for RCS that are described in section 4.

6.1.6.2 Non-CPM Initiated

Not applicable for RCS following the use cases and technology choices for RCS that are described in section 4.

6.1.7 Participant Information Handling

Not applicable for RCS following the use cases and technology choices for RCS that are described in section 4

6.2 Interworking with SMS

No differences with [CPMIW].

As a clarification for RCS:

- On 3GPP compliant networks, the IP_SM_GW interworking realisation can be used.
- The External Short Message Entity (ESME) as an interworking realization can be used on non-3GPP compliant networks. Unlike the IP (Internet Protocol) Short Message Gateway (IP-SM-GW) realization in a 3GPP compliant setup, the ESME interworking realization cannot be used for the receiving of mobile terminated SMS requests originated by a user in another network and is therefore of limited use in the interworking towards CPM Standalone Messages on such networks.

6.2.1 IP Short Message Gateway (IP-SM-GW) Realization

No differences with [CPMIW].

As a clarification for RCS:

- Further details on the applicable parts of 3GPP TS 29.311 are given in [29.311ENDORSE].

6.2.2 External Short Message Entity Realization

No differences with [CPMIW]. For the architecture figure 1, the SMSC can either be a SMSC or a SMPP GW. If a SMPP GW is used for routing purpose, the SMPP GW is equivalent to the SMSC in this diagram.

6.2.2.1 Interworking from CPM to SMS

No differences with [CPMIW].

6.2.2.1.1 Pager Mode CPM Standalone Message to SMS Message

No differences with [CPMIW].

6.2.2.1.2 SMS Status Report to CPM Delivery Notification

No differences with [CPMIW].

6.2.2.1.3 CPM Session Invitation to SMS Message

No differences with [CPMIW] after taking into account the use cases and technology choices for RCS that are described in section 4.

6.2.2.1.4 CPM Session Leaving Request to SMS Message

Not applicable for RCS following the use cases and technology choices for RCS that are described in section 4.

6.2.2.1.5 CPM Chat Message to SMS Message

No differences with [CPMIW].

6.2.2.1.6 Participant Information to SMS Message Procedures and Parameters mapping

Not applicable for RCS following the use cases and technology choices for RCS that are described in section 4

6.2.2.2 SMS to CPM

No differences with [CPMIW].

6.2.2.2.1 SMS Message to Pager Mode CPM Standalone Message

Following differences with [CPMIW]:

- Also the clarifications given in section 7.2.1 of [CPMCONVENDORSE] have to be taken into account in step 3
- Priority will be ignored

6.2.2.2.2 SMS Message to CPM Chat Message

No differences with [CPMIW].

As a clarification for RCS:

- The value of the received MSRP responses will determine the command_status returned in the deliver_sm_resp

6.2.2.2.3 SMS Message to Large Message Mode CPM Standalone Message

Following differences with [CPMIW]:

- Also the clarifications given in section 7.2.1.2 of [CPMCONVENDORSE] have to be taken into account in step 3

6.2.2.2.4 SMS Message to CPM Session leaving request

Not applicable for RCS following the use cases and technology choices for RCS that are described in section 4.

6.2.3 Unsuccessful SMS delivery

No differences with [CPMIW].

6.2.3.1 Alert procedure when UE is available for SMS

No differences with [CPMIW].

6.2.3.2 CPM Interworking Events handling

No differences with [CPMIW].

6.2.4 Successful SMS delivery

No differences with [CPMIW].

6.3 Interworking with MMS

No differences with [CPMIW].

6.3.1 MM4 Realization

No differences with [CPMIW].

6.3.1.1 Interworking from CPM to MMS

No differences with [CPMIW] after taking into account the use cases and technology choices for RCS that are described in section 4.

6.3.1.1.1 Pager Mode CPM Standalone Message to MMS Message

No differences with [CPMIW] after taking into account the use cases and technology choices for RCS that are described in section 4.

6.3.1.1.2 Large Message Mode CPM Standalone Message to MMS Message

Following differences with [CPMIW] after taking into account the use cases and technology choices for RCS that are described in section 4:

- When handling the INVITE request, any non-supported MIME types will remain included in the Session Description Protocol (SDP) provided in the 200 OK response. Unsupported content will be discarded once the message has been received completely
- Acknowledgement Request: this will be set for RCS

6.3.1.1.3 MMS Delivery Report to CPM Disposition Notification

Following differences with [CPMIW]:

- “CPIM: To” will always be set according to the “Sender Address”

6.3.1.1.4 MMS Read Reply to CPM Standalone Message Disposition Notification

Following differences with [CPMIW]:

- “CPIM: To” will always be set according to the “Sender Address”

6.3.1.1.5 CPM File Transfer to MMS Message

Not applicable for RCS following the use cases and technology choices for RCS that are described in section 4

6.3.1.1.6 CPM Session Interworking

Not applicable for RCS following the use cases and technology choices for RCS that are described in section 4.

6.3.1.1.7 Successful MMS Transmission

No differences with [CPMIW] after taking into account the use cases and technology choices for RCS that are described in section 4.

6.3.1.2 Interworking from MMS to CPM

No differences with [CPMIW] after taking into account the use cases and technology choices for RCS that are described in section 4.

6.3.1.2.1 MMS to Pager Mode CPM Standalone Message

Following differences with [CPMIW] after taking into account the use cases and technology choices for RCS that are described in section 4:

- Also the clarifications given in section 7.2.1.1 of [CPMCONVENDORSE] have to be taken into account in step 1
- Recipient-list-history: e-mail addresses will not be included in the recipient-list-history of the CPM Pager Mode request

6.3.1.2.2 MMS Message to a Large Message Mode CPM Standalone Message

Following differences with [CPMIW] after taking into account the use cases and technology choices for RCS that are described in section 4:

- Also the clarifications given in section 7.2.1.2 of [CPMCONVENDORSE] have to be taken into account in step 1
- Step 2: in case a BYE request is received before all MSRP SEND requests have been acknowledged, a 200 OK response will be sent to the BYE request and the media plane will be released. Step 3 will be skipped
- Step 2 in case the TCP (Transmission Control Protocol) connection for MSRP is lost or an error response is received on one of the MSRP requests, no further data will be sent and step 4 will be initiated.
- Recipient-list-history: e-mail addresses will not be included in the recipient-list-history of the CPM Pager Mode request

6.3.1.2.3 CPM Delivery Notification to MMS MM4_delivery_report

Following differences with [CPMIW] after taking into account the use cases and technology choices for RCS that are described in section 4:

- Acknowledgement Request will not be set for RCS

6.3.1.2.4 CPM Read Report to MMS MM4 Read Reply

Following differences with [CPMIW] after taking into account the use cases and technology choices for RCS that are described in section 4:

- If a read report is received for a message that would have expired already, it won't be delivered
- Acknowledgement Request will not be set for RCS

6.4 Interworking with E-Mail

Not applicable for RCS following the use cases and technology choices for RCS that are described in section 4.

6.5 Interworking with OMA SIMPLE IM

Not applicable for RCS following the use cases and technology choices for RCS that are described in section 4.

Appendix A. Change History

Appendix not relevant for RCS: as with the other RCS documents the history table is at the end of the document.

Appendix B. Static Conformance Requirements

Appendix not relevant for RCS

Appendix C. Release Version in User-Agent and Server Headers

No differences with [CPMIW].

C.1. VERSION 1.0

Not applicable for this version of RCS.

C.2. VERSION 2.0

Not applicable for this version of RCS.

C.3. VERSION 2.1

No differences with [CPMIW].

Appendix D. Non-CPM Communication Service Identifier

No differences with [CPMIW].

Appendix E. Mapping Of CPM Standalone Message and E-Mail Identities

Appendix not relevant for RCS following the use cases and technology choices for RCS that are described in section 4.

Appendix F. Calculation of the Message-Correlator for SMS

Appendix of [CPMIW] not applicable for RCS:

- The procedures to be applied are described in section 4.1.4.4 of [PRD-RCC.07].

Following clarifications for RCS:

- Additional procedures to be applied as described in section 4.1.4.3 and 4.1.4.5 of [PRD-RCC.07].

Document Management

Document History

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
1.0	13 Aug 2012	First version for RCS 5.1 based on RCS 5.0 Document Approved by DAG and PSMC	PSMC	Tom Van Pelt / GSMA
1.0	26 Sep 2012	Added RCC.10 number		Tom Van Pelt / GSMA
1.0	18 Sep 2013	Transition to the Infocentre2 PRD template		Tom Van Pelt / GSMA
2.0	25 Sep 2013	Applied CR1001 approved by DAG and PSMC	PSMC	Tom Van Pelt / GSMA
3.0	07 May 2014	First version of the document for RCS 5.2: Include approved CR1002	GSG	Tom Van Pelt / GSMA
4.0	28 Feb 2015	First version of the document for RCS 5.3: Include approved CR1003	PSMC	Tom Van Pelt / GSMA
5.0	21 Mar 2016	First version of the document for RCS 6.0: Include approved CR1005	PSMC	Tom Van Pelt / GSMA
6.0	28 Jun 2017	First version of the document for RCS 7.0: Include approved CR1006	TG	Tom Van Pelt / GSMA
7.0	16 May 2018	Include approved CR1007	TG	Tom Van Pelt / GSMA
8.0	06 Dec 2018	Include approved CR1002	TG	Tom Van Pelt / GSMA
9.0	16 Oct 2019	Include approved CR1003	NG	Tom Van Pelt / GSMA

Other Information

Type	Description
Document Owner	Network Group, Global Specification Group
Editor / Company	Tom Van Pelt, GSM Association

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.