Rich Communications Suite 5.1 Endorsement of 3GPP TS 29.311 Service level Interworking for Messaging Services
Version 1.0
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Security Classification – NON - CONFIDENTIAL GSMA Material

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1 Introduction

1.1 Overview

This document describes which sections of the 3rd Generation Partnership Project (3GPP) Service Level Interworking for Messaging Service specification (see [TS29.311]) are supported by Rich Communications Suite (RCS) 5.1.

For details on how this fits in the scope of RCS 5.1, please see [RCS5.1] and [CPMIWENDORSE].

For easier reference this document follows the same structure as [TS29.311]. For that reason the headings of the sections are citations of the headings used in [TS29.311], within the sections they describe what part the equivalent section in [TS29.311] is supported by RCS. For sections that are not applicable in their entirety, this is mentioned at the top level of the section and the subsections are not mentioned explicitly thereafter. For sections in which no difference with [TS29.311] is introduced however, also the subsections are mentioned to state explicitly that they are applicable as well.

This specification lists differences and clarifications for RCS compared to [TS29.311]. The former category includes both differences in expected behaviour compared to [TS29.311] as well as corrections in behaviour, which should disappear over time when bug fixes will be applied to [TS29.311]. The latter category describes what options are chosen for RCS in case [TS29.311] 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) used for the messaging technology in this release of RCS. It describes the realization of an Interworking Function (IWF) as it is described in [CPMIW] with further clarifications in [CPMIWENDORSE].

1.3 Definition of Terms

Term	Description
3GPP	3rd Generation Partnership Project
AS	Application Server
CPIM	Common Presence and Instant Messaging
CPM	Converged IP Messaging
CS	Circuit Switched
GRUU	Globally Routable User Agent URI
ICSI	IMS Communication Service Identifier
IETF	Internet Engineering Task Force
IM	Instant Messaging
IMDN	Instant Message Disposition Notification
IMS	IP Multimedia Subsystem
IP	Internet Protocol
IP-SM-GW	IP short Message Gateway
IWF	Interworking Function
LTE	Long Term Evolution
MIME	Multipurpose Internet Mail Extensions
MSISDN	Mobile Station International ISDN Number
MSRP	Message Session Relay Protocol
OMA	Open Mobile Alliance
PS	Packet Switched
RCS	Rich Communication Suite

RFC	Request For Comments
SDP	Session Description Protocol
SIMPLE	SIP for Instant Messaging and Presence Leveraging Extensions
SIP	Session Initiation Protocol
SM	Short Messages
SMS	Short Message Service
SMS-C	Short Message Service Centre
SMSoIP	SMS over IP
TCP	Transmission Control Protocol
UA	User Agent
UAC	User Agent Client
UAS	User Agent Server
UE	User Equipment
URI	Uniform Resource Identifier
URN	Uniform Resource Name
VoHSPA	Voice over HSPA
VoLTE	Voice over LTE

1.4   Document Cross-References

Document	Name
[RCS5.1]	RCS 5.1 - Advanced Communications: Services and Client Specification, Version 1.0, 13 August 2012 http://www.gsma.com/rcs/
[TS29.311]	TS 29.311: Service level interworking for Messaging Services (release10), v10.2.0, 2010-09 http://www.3gpp.org
[CPMCONVFUNC]	CPM Conversation Functions, Open Mobile Alliance Ltd. OMA-TS-CPM_Conv_Fnct-V1_0-20101012-C http://member.openmobilealliance.org/ftp/public_documents/COM/COM-CPM/Permanent_documents/OMA-TS-CPM_Conv_Fnct-V1_0-20101012-C.zip
[CPMIW]	CPM Interworking, Open Mobile Alliance Ltd. OMA-TS-CPM_Interworking-V1_0-20101012-C http://member.openmobilealliance.org/ftp/public_documents/COM/COM-CPM/Permanent_documents/OMA-TS-CPM_Interworking-V1_0-20101012-C.zip
[CPMIWENDORSE]	RCS 5.1 Endorsement of OMA CPM 1.0 Interworking, Version 1.0, 13 August 2012 http://www.gsma.com/rcs/
[CPMCONVENDORSE]	RCS 5.1 Endorsement of OMA CPM 1.0 Conversation Functions, Version 1.0, 13 August 2012 http://www.gsma.com/rcs/
[RFC5438]	Instant message Disposition Notification (IMDN), February 2009 http://www.ietf.org/rfc/rfc5438.txt

2   References

See chapter 1.4.

3   Definitions and Abbreviations

The same conventions, terminology, definitions and abbreviations used in chapter 3 of [TS29.311] are valid for RCS. Additional abbreviations and terms specific for this document can be found in chapter 1.3.

4   Overview of Service Level Interworking for Messaging Services

Note: RCS 5.1 supports the following in the area of interworking with SMS

- Interworking of pager mode and large message mode CPM (Converged IP Messaging) standalone messages to and from SMS
- Interworking of CPM 1-to 1 and ad-hoc Group sessions to SMS
- Interworking of CPM disposition notifications to and from SMS

RCS 5.1 does not support the following in the area of interworking with SMS:

- Interworking of SIMPLE (SIP for Instant Messaging and Presence Leveraging Extensions) IM (Instant Messaging) for pager mode, large message mode and file transfer and sessions to and from SMS
- Interworking of CPM file transfer

4.1   Introduction

Following differences with [TS29.311]:

- The case for communication between SM (short message) UE (User Equipment) and instant message UE is not applicable for RCS

4.2   Service Level Interworking between SM and IM

No differences with [TS29.311].

As a clarification for RCS:

- Instant message is to be interpreted as a CPM standalone message (pager mode or large message mode)

4.3   Interaction with Transport Layer Interworking

No differences with [TS29.311].

As a clarification for RCS:

- All RCS users will be subscribed to service level interworking
- Users having a Voice over LTE/Voice over HSPA (VoLTE/VoHSPA) enabled device (see [RCS5.1] for definition) or broadband access client will be subscribed to transport layer interworking as well
- The interworking type to be applied will depend on the type of message. SMS messages containing a text message will be interworked using service level interworking. Other SMS messages will be delivered either using transport layer interworking if the primary device is a BA (Broadband Access) or VoLTE/VoHSPA enabled client or as SMS over CS/PS (Circuit Switched / Packet Switched) in other cases.

4.4   Service Level Interworking between SM and Chat Session

No differences with [TS29.311].

5   Functional Entities

5.1   Application Server (AS)

No differences with [TS29.311].

6   Roles

6.1   IP-Short-Message-Gateway (IP-SM-GW)

6.1.1   General

Following differences with [TS29.311]:

- For IM to SM interworking, the IP-SM-GW will also handle the receiving of INVITE requests and the sending and receiving of BYE requests
- For IM to SM interworking, the IP-SM-GW will also handle the receiving of MSRP (Message Session Relay Protocol) SEND requests
- For chat session to SM interworking the sending of an MSRP Success or Failure REPORT is not applicable for RCS

As a clarification for RCS:

- Instant message is to be interpreted as a CPM standalone message (pager mode or large message mode). The bullet on the services provided by the IP-SM-GW stating that a concatenated short message can be delivered as a large instant message is thus redundant.

6.1.2   Notification about registration status and UE capabilities

Following differences with [TS29.311]:

- Note 1: The ability to receive instant messages will be determined based on the presence of the uniform resource names (URNs) for CPM pager mode and large message mode CPM standalone requests amongst the values for the 3GPP ICSI (IMS Communication Service Identifier) feature tags. That is the +g.3gpp.icsi-ref feature tag has amongst others the values of urn%3Aurn-7%3A3gpp-service.ims.icsi.oma.cpm.msg and urn%3Aurn-7%3A3gpp-service.ims.icsi.oma.cpm.largemsg. The reference to OMA (Open Mobile Alliance) SIMPLE IM is thus not applicable for RCS

As a clarification for RCS:

- Since deferred messaging is provided, the ability for the UE to receive instant messages does not depend on registration status. The IP-SM-GW can use this mechanism though to learn about new users supporting CPM Standalone messages. From then on all SMS messages sent to that user will be interworked.
- RCS clients will support both pager mode and large message mode CPM standalone messages and will thus include both tags in the registration.

6.1.3   Handling of routing information

6.1.3.1   Answering routing information query

No differences with [TS29.311].

6.1.3.2   Querying of routing information

Following differences with [TS29.311]:

- In item b) for RCS, the MSISDN (Mobile Station International ISDN Number) of the receiver may also be extracted from the TEL or SIP (Session Initiation Protocol) URI (Uniform Resource Identifier) with the user=phone parameter as described in [RCS5.1]

6.1.4   Delivering short message(s) as an instant message

6.1.4.1   General

No differences with [TS29.311].

6.1.4.2   Receiving of SMS-DELIVER

No differences with [TS29.311].

As a clarification for RCS:

- First and last segment of a concatenated message refer to the order in which they are received rather than to their position in the concatenated message
- Service level interworking is needed for all RCS users. It will have preference over other available delivery mechanisms
- Also if a message is received consisting of a single segment, the message length will be checked. If shorter than the limit for a SIP message the procedure in section 6.1.4.3.1 will be followed, otherwise the one in section 6.1.4.3.2 applies.
- The first segments of a concatenated message shall be stored until the message is successfully delivered or until the message expires according to operator policy.

6.1.4.3   Sending of Instant Message

6.1.4.3.1   Sending of the instant message in a SIP MESSAGE request

Following differences with [TS29.311], due to the fact that the IP-SM-GW shall take into account the guidelines for the creation of a pager mode CPM standalone message that are given in section 7.2.1.1 of [CPMCONVFUNC] and [CPMCONVENDORSE]:

- For item b), as the IP-SM-GW has to behave as an IWF, it will include a non-CPM Communication Service Identifier in the P-Asserted-Identity as defined in Appendix D of [CPMIW].
- For item c), the MIME (Multipurpose Internet Mail Extensions) type in the Content-Type header field will be set to message/CPIM
- Items d) and e) are not applicable for RCS. The IP-SM-GW shall rather include a +g.3gpp.icsi-ref feature tag with a value of urn%3Aurn-7%3A3gpp-service.ims.icsi.oma.cpm.msg and a User Agent header as specified in Appendix C of [CPMIW].
- Also Conversation-ID and Contribution-ID headers as defined in Appendix C of [CPMCONVFUNC] will be included both with values generated by the IP-SM-GW
- No Expires header will be included
- For item g) the body will contain the contents of the short message(s) wrapped in a CPIM (Common Presence and Instant Messaging) wrapper as defined in section 7.2.1.3 of [CPMCONVFUNC] and [CPMCONVENDORSE]

As a clarification for RCS:

- For item a) a TEL URI or SIP URI with a user=phone parameter of the addressed CPM user will be included as specified in [RCS5.1]
- No IMDN (Instant Message Disposition Notification) related CPIM headers will be included

6.1.4.3.2   Sending of a large instant message

Following differences with [TS29.311], due to the fact that the IP-SM-GW shall take into account the guidelines for the creation of a large message mode CPM standalone message that are given in section 7.2.1.2 of [CPMCONVFUNC] and [CPMCONVENDORSE]:

- Items a), b) and c) are not applicable for RCS. The IP-SM-GW shall rather include a +g.3gpp.icsi-ref feature tag with a value of urn%3Aurn-7%3A3gpp-service.ims.icsi.oma.cpm.largemsg in the Contact and the Accept-Contact headers and a User Agent header as specified in Appendix C of [CPMIW].

- For item e), as the IP-SM-GW has to behave as an IWF, it will include a Non-CPM Communication Service Identifier in the P-Asserted-Identity as defined in Appendix D of [CPMIW].

- Also Conversation-ID and Contribution-ID headers as defined in Appendix C of [CPMCONVFUNC] will be included both with values generated by the IP-SM-GW

- No Message-Expires header will be included

- A Supported header with a value of 'timer' and a Session-Expires header with a refresher parameter set to 'uac' will be included

- For item g) the SDP (Session Description Protocol) body will be composed as defined in section 7.2.1.2 of [CPMCONVFUNC] and [CPMCONVENDORSE]

- The behaviour when a 2xx Response is received is not applicable for RCS as the procedure for setting up the session and sending the MSRP requests defined in section 7.2.1.2 of [CPMCONVFUNC] and [CPMCONVENDORSE] will be used instead

- When a response is received on the BYE request, the media plane resources shall be released and a status report shall be sent according to section 6.1.4.4

- When a response different from 2xx is received, an ACK request will be sent in order to acknowledge its reception and a negative delivery report will be sent according to section 6.1.4.4

- When a BYE request is received during the transmission of the message, the transmission will be stopped, a 200 OK response will be returned to the BYE request and the media plane resources will be released. Then a negative delivery report will be sent according to section 6.1.4.4

- When an error occurs during the MSRP transmission (loss of the TCP (Transmission Control Protocol) connection or a negative response to a MSRP SEND request), the MSRP transmission will be stopped, a BYE request will be sent and when a response is received on the BYE request, the media plane resources will be released. Then a negative delivery report will be sent according to section 6.1.4.4

As a clarification for RCS:

- For item d) a TEL URI or SIP URI with a user=phone parameter of the addressed CPM user will be included as specified in [RCS5.1]

- No IMDN related CPIM headers will be included

6.1.4.4   Sending of SMS-DELIVER-REPORT

6.1.4.4.1 Common Procedures

No differences with [TS29.311].

6.1.4.4.2 Sending of SMS-DELIVER-REPORT after short message(s) delivered in a SIP MESSAGE request

Following differences with [TS29.311]:

- The case for receiving of a non-2xx response to a SIP INVITE shall for RCS rather apply for a non-2xx response to a SIP MESSAGE.

- For RCS no attempts in other domains will be done in case of a non-2xx response

6.1.4.4.3 Sending of SMS-DELIVER-REPORT after concatenated short messages delivered in a large instant message

Following differences with [TS29.311]:

* For RCS no attempts in other domains will be done in case of a non-2xx response to the SIP INVITE
* For RCS no attempts in other domains will be done in case of a non-200 response to a MSRP SEND
* A non-2xx SIP Response for the BYE request will be treated in the same way as a 2xx response. That is, the error conveyed will be ignored as the BYE was sent after successful transmission of the request using MSRP
* A BYE request which was received before transmission of a large message was complete will be managed in the same way as an MSRP error. That is it will contain a user error parameter set to "System Failure" and a failure cause (TP-FCS) element set to "FF unspecified error cause"

As a clarification for RCS:

* The same procedure will also apply in case a single message was interworked to a large message

6.1.4.5 Procedure when delivery of a short message as instant message is not allowed

No differences with [TS29.311].

As a clarification for RCS:

* Operator policy will always be to try other domains. This will either be CS/PS for users with a (non-LTE (Long Term Evolution)) mobile as primary device or transport layer interworking for those users where the primary device is an LTE terminal or broadband access client. The IP-SM-GW will derive the domain to use from the registration information. If one of the clients registered the +g.3gpp.smsip feature tag, transport layer Interworking will be used

6.1.4.6 Retry after unsuccessful delivery of short message

No differences with [TS29.311].

As a clarification for RCS:

* For RCS operator policy for message for which service level interworking was applicable will always be not to try further domains. Whether other methods will be attempted for messages for which service level interworking was not the preferred method is out of scope for RCS.

6.1.5 Delivering an instant message as a (concatenated) short message in the terminating network

6.1.5.1 General

Following differences with [TS29.311]:

* The NOTE is not applicable for RCS. Large message mode CPM standalone requests will be received by the IP-SM-GW as described in chapter 6.1.2 of [CPMIW] and [CPMIWENDORSE].

6.1.5.2 Receiving of the instant message in a SIP MESSAGE request

Following differences with [TS29.311]:

- The message might also be received as a large message mode CPM standalone message as described in chapter 6.1.2 of [CPMIW] and [CPMIWENDORSE]. The same procedure applies in that case
- In Step 1 when deciding to interwork, also any other IMDN related headers will be stored such as for instance IMDN.Record-Route and the Disposition-Notification header itself.
- Step 1 when deciding to interwork will also apply in case the CPIM body in a large message Mode CPM standalone message included a Disposition-Notification header field with the value of "positive-delivery" or "negative-delivery"
- As a clarification for RCS:
- A value of "display" in the Disposition-Notification header field will be ignored.

6.1.5.3   Sending of SMS-DELIVER (over CS/PS or Internet Protocol (IP))

6.1.5.3.1 General

No differences with [TS29.311].

6.1.5.3.2 Common Procedures

Following differences with [TS29.311]:

- The same handling as described in Item e) will also apply in case the CPIM body in a large message Mode CPM standalone message included a Disposition-Notification header field with the value of "positive-delivery" or "negative-delivery"
- NOTE 2 is not applicable for RCS. There will always be an E.164 address in the P-Asserted-Identity for RCS.

As a clarification for RCS:

- A value of "display" in the Disposition-Notification header field will be ignored.
- For RCS, the IP-SM-GW will behave according to the default handling defined in NOTE 3

6.1.5.3.3 Sending of SMS-DELIVER over CS/PS

No differences with [TS29.311].

6.1.5.3.4 Sending of SMS-DELIVER over IP

Following differences with [TS29.311]:

- If the message was received as a large message mode CPM standalone message, the Request-URI will be mapped from the Request-URI of the associated SIP INVITE request
- In item d) if the message was received as a large message mode CPM standalone message, the MSISDN will be taken out of the received SIP INVITE request
- Once a response is received to all SMS over IP (SMSoIP) MESSAGE requests that were needed to send a CPM standalone message, a response will be sent to the pager mode CPM standalone message request or to the last MSRP SEND request in case the message was send as a large message mode CPM standalone message. In case all responses were of the 2xx-type of responses for a pager mode CPM standalone message this will be a 200 OK response as described in chapter 6.1.1 of [CPMIW] and [CPMIWENDORSE] and for a large message mode CPM standalone message a 200 Response as described in chapter 6.1.2 of [CPMIW] and [CPMIWENDORSE]. In case one or more of the responses were non-2XX type of responses, for a pager mode CPM standalone request a similar response will be sent. For a large message mode request, a 413 response will be used in this case, which will be sent as described in chapter 6.1.2 of [CPMIW] and [CPMIWENDORSE].

6.1.5.4   Receiving of SMS-DELIVER-REPORT (over CS/PS or IP)

6.1.5.4.1   Receiving of SMS-DELIVER-REPORT over CS/PS

Following differences with [TS29.311]:

* As described in chapter 6.1.2 of [CPMIWENDORSE] and [CPMIW], the same handling shall apply in case the message was received as a large message mode CPM standalone message. In that case the MT_FORWARD_SHORT_MESSAGE_ACK will not result in a response to a SIP MESSAGE, but rather to the final MSRP chunk in which the message was received whereby a successful delivery will result in a 200 response and any failed delivery will result in a 413 response. Disposition-Notifications will be sent to the sender of the INVITE request.

6.1.5.4.2   Receiving of SMS-DELIVER-REPORT over IP

Following differences with [TS29.311]:

* Like in chapter 6.1.5.4.1, the same handling shall apply in case the message was received as a large message mode CPM standalone message. In which case it will be the body of the MSRP request(s) that will contain the Disposition-Notification header field, amongst the CPIM headers.

6.1.5.5   Sending of IMDN

6.1.5.5.1   Sending of IMDN after a (concatenated) short message delivery over CS/PS

Following differences with [TS29.311], because the IP-SM-GW shall take into account the guidelines for the creation of an IMDN generation that are given in [RFC5438] and section 7.2.1.4 of [CPMCONVFUNC] and [CPMCONVENDORSE]:

* For item a) the stored sender identity will have been retrieved from a SIP INVITE request if the message was sent as a large message mode CPM standalone message and it will be inserted in the CPIM To header. It will also be set as the Request-URI in case no IMDN.Record-Route header fields were included in the CPIM headers of the CPM standalone message. If the Contact header of the INVITE request contained a pub-gruu parameter, this parameter will in this case be added to the Request URI. Otherwise, if at least one IMDN.Record-Route header was included as specified in [RFC5438], the Request URI will be set to the value of the topmost IMDN.Record-Route header field and the values of any other IMDN.Record-Route header fields will be inserted into the CPIM headers in the body of the MESSAGE request as values of IMDN.Route header fields maintaining the ordering of the IMDN.Record-Route header fields.

* Item b) is not applicable for RCS. A User-Agent header as defined in Appendix C of [CPMIW] will be included

* In item c) a non-CPM Communication Service Identifier will be included in the P-Asserted-Identity as defined in Appendix D of [CPMIW].

* Item d) is not applicable for RCS

* Also Conversation-ID and Contribution-ID headers as defined in Appendix C of [CPMCONVFUNC] will be included with respectively the same value as in the CPM standalone message (that is in the MESSAGE or INVITE request) and a value newly generated by the IP-SM-GW

* For item f) the reference should be to [CPMCONVFUNC] instead of to SIMPLE IM

* For a disposition notification to a large message mode CPM standalone message the message-ID will be retrieved out of the CPIM headers that were received through MSRP SEND requests

6.1.5.5.2 Sending of IMDN after a (concatenated) short message delivery over IP

Following differences with [TS29.311], due to the fact that the IP-SM-GW shall take into account the guidelines for the creation of an IMDN generation that are given in [RFC5438] and section 7.2.1.4 of [CPMCONVFUNC] and [CPMCONVENDORSE]:

- For item a) the stored sender identity will have been retrieved from a SIP INVITE request if the message was sent as a large message mode CPM standalone message and it will be inserted in the CPIM To header. It will also be set as the Request-URI in case no IMDN.Record-Route header fields were included in the CPIM headers of the CPM standalone message. If the Contact header of the INVITE request contained a pub-gruu parameter, this parameter will in this case be added to the Request URI. Otherwise if at least one IMDN.Record-Route header was included, as specified in [RFC5438], the Request URI will be set to the value of the topmost IMDN.Record-Route header field and the values of any other IMDN.Record-Route header fields will be inserted into the CPIM headers in the body of the MESSAGE request as values of IMDN.Route header fields maintaining the ordering of the IMDN.Record-Route header fields.

- In item b) a Non-CPM Communication Service Identifier will be included in the P-Asserted-Identity as defined in Appendix D of [CPMIW].

- Item c) is not applicable for RCS

- Item d) is not applicable for RCS. A User-Agent header as defined in Appendix C of [CPMIW] will be included

- Also Conversation-ID and Contribution-ID headers as defined in Appendix C of [CPMCONVFUNC] will be included with respectively the same value as in the CPM standalone message (that is in the MESSAGE or INVITE request) and a value newly generated by the IP-SM-GW

- For item f) the reference should be to [CPMCONVFUNC] instead of to SIMPLE IM

- For a disposition notification to a large message mode CPM standalone message the message-ID will be retrieved out of the CPIM headers that were received through MSRP SEND requests

6.1.5.6 Retry after unsuccessful delivery of short message

No differences with [TS29.311].

6.1.5.7 Error handling when interworking from instant message to short message is not possible

Following differences with [TS29.311]:

- When the message to be Interworked is received as a large message mode CPM standalone message, (if based on the SDP in the INVITE request) it can be determined that none of the content in the message will be inter-workable to a short message. The INVITE request will be rejected with a 488 "Not Acceptable Here" response and shall include an Accept header field listing the types of text media supported by SM, as described in 3GPP TS 26.141.

- If for any other reason based on the INVITE request for a large message mode CPM standalone message it can be determined that interworking is not possible a 488 "Not Acceptable Here" response shall be returned to the INVITE request.

- If for a large message mode CPM standalone message, it is detected that none of the content in the message is inter-workable to a short message when the MSRP requests have been or are being received, all MSRP requests for which no response was sent so far will be rejected with a 415 response

- In case during the MSRP transmission of a large message mode CPM standalone message it is determined that interworking is not possible, all MSRP requests for which no response was sent so far will be rejected with a 413 response

6.1.5.8   Partial interworking from instant message to short message

No differences with [TS29.311].

6.1.6   Submitting an instant message as a (concatenated) short message in the originating network

6.1.6.1   General

Following differences with [TS29.311]:

- The NOTE is not applicable for RCS. Large message mode CPM standalone requests will be received by the IP-SM-GW as described in chapter 6.1.2 of [CPMIW] and [CPMIWENDORSE].

6.1.6.2   Receiving of the instant message in a SIP MESSAGE request

Following differences with [TS29.311]:

- The message might also be received as a large message mode CPM standalone message as described in chapter 6.1.2 of [CPMIW] and [CPMIWENDORSE]. The same procedure applies in that case

- When involved, the IP-SM-GW doesn't have to check whether it can find a valid SIP address for the recipient. That will have been done by the CPM Participating or Controlling Function already.

- In step 2) service level interworking will always be possible if the content type in the request allows it. For a large message mode CPM standalone message, this will be verified based on the SDP in the SIP INVITE request as described in chapter 6.1.2 of [CPMIW] and [CPMIWENDORSE].

- In step 1 when deciding to interwork a pager mode CPM standalone message, the 202 Accepted Response shall contain a Server header set as specified in Appendix C of [CPMIW]. It shall also contain Conversation-ID, Contribution-ID and if provided in the SIP MESSAGE request, InReplyTo-Contribution-ID headers as defined in [CPMCONVFUNC] with the same values as in the received MESSAGE request

- In step 1 when deciding to interwork a large message mode CPM standalone message, as described in chapter 6.1.2 of [CPMIW] and [CPMIWENDORSE], the IWF will accept the INVITE request with a 200 OK response. Also based on the final MSRP SEND request the IP-SM-GW will respond with a 200 Response. Then Step 2 will be executed where the P-Asserted-Identity header will be retrieved from the INVITE request and the IMDN related header fields from the CPIM headers in the message received through MSRP

- In Step 2 also any IMDN.Record-Route and other CPIM headers will be stored as well as the Conversation-ID from the SIP MESSAGE request for a pager mode CPM standalone message and from the INVITE request for a large message mode CPM standalone message

As a clarification for RCS:

- In Step 1: the NOTE will apply as the decision to involve the IP-SM-GW has been taken by the CPM Participating or Controlling Function where a policy could have been applied already. So there is no need to verify it in the IP-SM-GW

6.1.6.3   Sending of SMS-SUBMIT over CS/PS

Following differences with [TS29.311]:

- The case where privacy was requested in the SIP MESSAGE request is not applicable for RCS. The value the SM-RP-OA will be based on the value of the P-Asserted-Identity header of either the SIP MESSAGE request in case of a pager mode CPM standalone message or the SIP INVITE request in case of a large message mode CPM standalone message. As for RCS, the P-Asserted-Identity header will, as described in [RCS5.1] contain an E.164 based URI for the sender

- For item c), in case of a large message mode CPM standalone message, it will be the Message-Expires header field defined in [CPMCONVFUNC] that will be checked for a non 0 value

- For item d), in case of a large message mode CPM standalone message, the value of the TP VP header will be based on the Message-Expires header field value defined in [CPMCONVFUNC] and the optional Date header field

- For item f) in case of a large message mode CPM standalone message, it will be the Disposition-Notification header field the CPIM body in the message received through the MSRP that will be checked

As a clarification for RCS:

- In Item i) in case of a pager mode CPM standalone message, it will be the Request URI out of the SIP MESSAGE request that will be used and in case of a large message mode CPM standalone message it will be the one out of the SIP INVITE request

- For RCS, the IP-SM-GW shall behave according to the default action defined in the NOTE

6.1.6.4 Receiving of SMS-SUBMIT-REPORT

Following differences with [TS29.311]:

- The same handling shall apply in case the message was received as a large message mode CPM standalone message in which case the instant message Delivery Notification will be sent to the sender of the associated SIP INVITE request.

- In case the message was delivered as a concatenated short messages the value of the TP Service Centre Time Stamp element of all associated SMS-SUBMIT-REPORT messages will be stored

- In case the message was delivered as a concatenated short messages and a SMS-SUBMIT-REPORT is received that contains a User Error parameter for one of the segments, after sending the instant message delivery notification all stored information related to the message will be discarded and no further storage of value of a TP Service Centre Time Stamp element received in a SMS-SUBMIT-Report associated to the message will be performed

6.1.6.5 Receiving of SMS-STATUS-REPORT

Following differences with [TS29.311]:

- The same handling shall apply in case the instant message was received as a large message mode CPM standalone message. It will be the Disposition-Notification header field out of the CPIM body in the message received through the MSRP that will be used. The instant message delivery notification will be sent to the sender of the associated SIP INVITE request.

6.1.6.6 Sending of IMDN (both for SUBMIT-REPORT and STATUS-REPORT)

Following differences with [TS29.311], due to the fact that the IP-SM-GW shall take into account the guidelines for the creation of an IMDN generation that are given in [RFC5438] and section 7.2.1.4 of [CPMCONVFUNC] and [CPMCONVENDORSE]:

- For item a) the stored sender identity will have been retrieved from a SIP INVITE request if the message was sent as a large message mode CPM standalone message and it will be inserted in the CPIM To header. It will also be set as the Request-URI in case no IMDN.Record-Route header fields were included in the CPIM headers of the CPM standalone message. If the Contact header of the INVITE request contained a pub-gruu parameter, this parameter will in this case be added to the Request URI. Otherwise if at least one IMDN.Record-Route header was included, as specified in [RFC5438], the Request URI will be set to the value of the topmost IMDN.Record-Route header field and the values of any other IMDN.Record-Route header fields will be inserted into the CPIM headers in the body of the MESSAGE request as values of IMDN.Route header fields maintaining the ordering of the IMDN.Record-Route header fields.

- In item b) a non-CPM Communication Service Identifier will be included in the P-Asserted-Identity as defined in Appendix D of [CPMIW].

- Item c) is not applicable for RCS

- Item d) is not applicable for RCS. A User-Agent header as defined in Appendix C of [CPMIW] will be included

- Also Conversation-ID and Contribution-ID headers as defined in Appendix C of [CPMCONVFUNC] will be included with respectively the same value as in the CPM standalone message (that is in the MESSAGE or INVITE request) and a value newly generated by the IP-SM-GW

- For item f) the reference should be to [CPMCONVFUNC] instead of to SIMPLE IM

- For a disposition notification to a large message mode CPM standalone message the message-ID will be retrieved out of the CPIM headers that were received through MSRP SEND requests

6.1.6.7 Error handling when interworking from instant message to short message is not possible

Following differences with [TS29.311]:

- When the message to be Interworked is received as a large message mode CPM standalone message, (if based on the SDP in the INVITE request) it can be determined that none of the content in the message will be inter-workable to a short message. The INVITE request, will be rejected with include a 488 "Not Acceptable Here" response and include, an Accept header field, listing the types of text media supported by SM as described in 3GPP TS 26.141.

- If for any other reason based on the INVITE request for a large message mode CPM standalone message it can be determined that interworking is not possible a 488 "Not Acceptable Here" response shall be returned to the INVITE request.

- If for a large message mode CPM standalone message, it is detected that none of the content in the message is inter-workable to a short message when the MSRP requests have been or are being received, all MSRP requests for which no response was sent so far will be rejected with a 415 response

- In case during the MSRP transmission of a large message mode CPM standalone message it is determined that interworking is not possible, all MSRP requests for which no response was sent so far will be rejected with a 413 response

6.1.6.8 Partial interworking from instant message to short message

No differences with [TS29.311].

6.1.7 Receiving of the chat session invitation request in the terminating network

6.1.7.1 Receiving of the chat session SIP INVITE request

Following differences with [TS29.311]:

- Behaviour shall take into account the handling defined in section 6.1.4 of [CPMIW] including the clarifications given to that chapter in [CPMIWENDORSE] and the handling for multiple outstanding 1-to-1 sessions, request bodies and the Subject header described therein

As a clarification for RCS:

- The case where the SIP INVITE request contains a Privacy header field with "header" or "user" or "id" is not applicable for RCS. Operator policy will not allow this.
- For RCS operator policy will be to inform the user of the chat session invitation.
- If the SIP INVITE request times out before a response is received from the SMS user it will be rejected with a 408 "Request Timeout" response.

6.1.7.2 Sending of the SMS-DELIVER (over CS/PS or IP)

No differences with [TS29.311].

As a clarification for RCS:

- The case where the SIP INVITE request contains a Privacy header field with "header" or "user" or "id" is not applicable for RCS. Operator policy will not allow this.
- The INVITE Request may have to be sent as multiple concatenated short messages

6.1.7.3 Receiving of SMS-DELIVER-REPORT (over CS/PS or IP)

6.1.7.3.1 Receiving of SMS-DELIVER-REPORT over CS/PS

No differences with [TS29.311].

6.1.7.3.2 Receiving of SMS-DELIVER-REPORT over IP

No differences with [TS29.311].

6.1.7.4 Receiving of the SMS-DELIVER as a response to the chat session SIP INVITE request

Following differences with [TS29.311]:

- Behaviour shall take into account the handling defined in section 6.1.4 of [CPMIW] including the clarifications given to that chapter in [CPMIWENDORSE] and the handling for multiple outstanding 1-to-1 sessions described there
- If the SIP INVITE request times out before a response is received from the SMS user, the IP-SM-GW will release any specific MSISDN assigned for this chat session
- When a response is received from a SMS user on an MSISDN that is not assigned to a session, a MT_FORWARD_SHORT_MESSAGE_ACK response will be sent with the SM-RP-UI parameter set to value SMS-DELIVER-REPORT and including a User Error parameter set to "System Failure" and the TP-FCS element of the deliver report set to "FF Unspecified error case" other parameters will be set as in chapter 6.1.4.4.1 of [TS29.311]

6.1.7.5 Sending of the chat session SIP 200 (OK) response as a result of the response from the SMS user

Following differences with [TS29.311]:

- Behaviour shall take into account the handling defined in section 6.1.4 of [CPMIW] including the clarifications given to that chapter in [CPMIWENDORSE] and the handling for MSRP described there.

- In the SDP answer in the accept-wrapped-types only the text mime types from the offer will be maintained.

6.1.8 Receiving of the chat session invitation request in the originating network

6.1.8.1 Receiving of the chat session SIP INVITE request

Following differences with [TS29.311]:

- Behaviour shall take into account the handling defined in section 6.1.4 of [CPMIW] including the clarifications given to that chapter in [CPMIWENDORSE] and the handling for multiple outstanding 1-to-1 sessions and the Subject header described therein

As a clarification for RCS:

- The case where the SIP INVITE request contains a Privacy header field with "header" or "user" or "id" is not applicable for RCS. Operator policy will not allow this.

- For RCS operator policy will be to inform the user of the chat session invitation.

- If the SIP INVITE request times out before a response is received from the SMS user it will be rejected with a 408 "Request Timeout" response.

6.1.8.2 Sending of the SMS-SUBMIT

No differences with [TS29.311].

As a clarification for RCS:

- The case where the SIP INVITE request contains a Privacy header field with "header" or "user" or "id" is not applicable for RCS. Operator policy will not allow this.

- The INVITE Request may have to be sent as multiple concatenated short messages

6.1.8.3 Receiving of SMS-SUBMIT-REPORT

No differences with [TS29.311].

6.1.8.4 Receiving of the SMS-DELIVER as a response to the chat session invitation

Following differences with [TS29.311]:

- Behaviour shall take into account the handling defined in section 6.1.4 of [CPMIW] including the clarifications given to that chapter in [CPMIWENDORSE] and the handling for multiple outstanding 1-to-1 sessions described there

- If the INVITE request times out before a response is received from the SMS user, the IP-SM-GW will release any specific MSISDN assigned for this chat session

- When a response is received from a SMS user on an MSISDN that is not assigned to a session, a MT_FORWARD_SHORT_MESSAGE_ACK response will be sent with the SM-RP-UI parameter set to value SMS-DELIVER-REPORT and including a User Error parameter set to "System Failure" and the TP-FCS element of the deliver report set to "FF Unspecified error case" other parameters will be set as in chapter 6.1.4.4.1 of [TS29.311]

6.1.8.5 Sending automatic chat session SIP 200 (OK) response

Following differences with [TS29.311]:

- Behaviour shall take into account the handling defined in section 6.1.4 of [CPMIW] including the clarifications given to that chapter in [CPMIWENDORSE] and the handling for MSRP described there.

- In the SDP answer in the accept-wrapped-types only the text mime types from the offer will be maintained.

6.1.9 Delivering a short message as an MSRP SEND in an ongoing chat session anchored in the terminating network

6.1.9.1 Receiving of SMS-DELIVER when recipient is an MSISDN assigned by the IP-SM-GW on the terminating side

Following differences with [TS29.311]:

- In Step 2 only text SMS messages will be interworked

6.1.9.2 Sending of MSRP SEND request

Following differences with [TS29.311]:

- Behaviour shall take into account the handling defined in section 6.1.5.1 of [CPMIW] including the clarifications given to that chapter in [CPMIWENDORSE]
- For item g) the appropriate MIME type will be text/plain

As a clarification for RCS:

- If the message is sent in multiple chunks, transmission of further chunks will be stopped when a negative response is received to one of the MSRP SEND requests

6.1.9.3 Sending of SMS-DELIVER-REPORT

Following differences with [TS29.311]:

- If the message is sent in multiple chunks, a report shall not be sent until either a response is received to the last chunk that was sent or the TCP connection associated to the MSRP session is lost.
- In case a negative response was received for one of the chunks or the TCP connection is lost, the User Error Parameter in the MT-FORWARD-SHORT-MESSAGE-ACK will be set to "System Failure" and the TP-FCS element will be set to "FF Unspecified error cause"

6.1.10 Delivering a short message as an MSRP SEND request in an ongoing chat session anchored in the originating network

6.1.10.1 Receiving of SMS-DELIVER when recipient address is actual MSISDN of recipient

Not applicable for RCS

6.1.10.2 Receiving of SMS-DELIVER when recipient is an MSISDN assigned by the IP-SM-GW on the originating side

No differences with [TS29.311].

As a clarification for RCS:

- The differences and clarifications listed to chapter 6.1.9.1 in this document apply as well

6.1.10.3 Sending of MSRP SEND request

No differences with [TS29.311].

As a clarification for RCS:

- The differences and clarifications listed to chapter 6.1.9.2 in this document apply as well

6.1.10.4 Sending of SMS-DELIVER-REPORT

No differences with [TS29.311].

As a clarification for RCS:

- The differences and clarifications listed to chapter 6.1.9.3 in this document apply as well

6.1.11 Delivering an MSRP SEND request in an ongoing chat session anchored in the terminating network as a (concatenated) short message

6.1.11.1 Receiving of the MSRP SEND request

Following differences with [TS29.311]:

- Behaviour shall take into account the handling defined in section 6.1.5.1 of [CPMIW] including the clarifications given to that chapter in [CPMIWENDORSE]
- In case a message is delivered in multiple chunks, all but the last MSRP SEND request will be responded to with a 200 response

6.1.11.2 Sending of the SMS-DELIVER (over CS/PS or IP)

Following differences with [TS29.311]:

- Behaviour shall take into account the handling defined in section 6.1.5.1 of [CPMIW] including the clarifications given to that chapter in [CPMIWENDORSE]
- In a Group Chat, rather than the user that invited for the session, the short message shall include the MSISDN of the sender of the message that can be obtained from the CPIM From header. In case the CPIM From doesn't carry a E.164 based address, the complete URI will be used as sender address

As a clarification for RCS:

- The case where the SIP INVITE request contains a Privacy header field with "header" or "user" or "id" is not applicable for RCS. Operator policy will not allow this.
- The message may have to be sent as multiple concatenated short messages
- The IP-SM-GW will start transmitting the SMS messages only once the complete chat message has been received as only then the proper character encoding can be determined

6.1.11.3 Receiving of SMS-DELIVER-REPORT (over CS/PS or IP)

6.1.11.3.1 Receiving of SMS-DELIVER-REPORT over CS/PS

Following differences with [TS29.311]:

- The case where the associated MSRP SEND request contains a request for a Success-Report is not applicable for RCS
- The case where the associated MSRP SEND request contains a request for a Failure-Report is applicable for RCS, MSRP REPORT requests in case of a failure to deliver the message are not used though as any error is reflected in the MSRP response code already.

6.1.11.3.2 Receiving of SMS-DELIVER-REPORT over IP

Following differences with [TS29.311]:

- The case where the associated MSRP SEND request contains a request for a Success-Report is not applicable for RCS
- In case for all the SMSoIP MESSAGEs used to send the message a SMSoIP MESSAGE is received containing an RP-ACK message in the body, the final MSRP request shall be responded to with a 200 response
- The case where the associated MSRP SEND request contains a request for a Failure-Report is applicable for RCS, MSRP REPORT requests in case of a failure to deliver the message are not used though as any error is reflected in the MSRP response code already.

- In case for one of the SMSoIP MESSAGEs used to send the message a SMSoIP MESSAGE is received containing an RP-ERROR message in the body and delivery through other domains is not possible or fails, the final MSRP request shall be responded to with a 413 response

6.1.11.4 Sending of the MSRP REPORT request

Not applicable for RCS

6.1.12 Submitting an MSRP SEND request in an ongoing chat session anchored in the originating network as a (concatenated) short message

6.1.12.1 Receiving of the MSRP SEND request

Following differences with [TS29.311]:

- Behaviour shall take into account the handling defined in section 6.1.5.1 of [CPMIW] including the clarifications given to that chapter in [CPMIWENDORSE]
- In case a message is delivered in multiple chunks, all but the last MSRP SEND request will be responded to with a 200 response

6.1.12.2 Sending of the SMS-SUBMIT

Following differences with [TS29.311]:

- Behaviour shall take into account the handling defined in section 6.1.5.1 of [CPMIW] including the clarifications given to that chapter in [CPMIWENDORSE]
- In a Group Chat, rather than the user that invited for the session, the short message shall include the MSISDN of the sender of the message that can be obtained from the CPIM From header. In case the CPIM From doesn't carry a E.164 based address, the complete URI will be used as sender address

As a clarification for RCS:

- The case where the SIP INVITE request contains a Privacy header field with "header" or "user" or "id" is not applicable for RCS. Operator policy will not allow this.
- The message may have to be sent as multiple concatenated short messages
- The IP-SM-GW will start transmitting the SMS messages only once the complete chat message has been received as only then the proper character encoding can be determined

6.1.12.3 Receiving of SMS-SUBMIT-REPORT (over CS/PS or IP)

Following differences with [TS29.311]:

- The case where the associated MSRP SEND request contains a request for a Success-Report is not applicable for RCS
- In case for all the short messages used to send the chat message a positive SMS-SUBMIT-REPORT is received, the final MSRP request used to send the chat message shall be responded to with a 200 response
- The case where the associated MSRP SEND request contains a request for a Failure-Report is applicable for RCS, MSRP REPORT requests in case of a failure to deliver the message are not used though as any error is reflected in the MSRP response code already.
- In case for one the short messages used to send the chat message a MO_FORWARD_SHORT_MESSAGE_ACK with a SMS-SUBMIT-REPORT and a User Error parameter is received, the final MSRP request shall be responded to with a 413 response

6.1.12.4 Sending of the MSRP REPORT request

Not applicable for RCS

6.1.13 Handling of the chat session teardown request received as a short message in the terminating network

6.1.13.1 General

Following differences with [TS29.311]:

- The handling described in chapter 6.1.6.2 of [CPMIW] and the differences and clarifications given for that section in [CPMIWENDORSE] will be taken into account as well

6.1.13.2 Receiving of SMS-DELIVER containing a chat session teardown request

No differences with [TS29.311].

As a clarification for RCS:

- For item 2) An operator may define multiple texts indicating a teardown request depending on for instance the language

6.1.14 Handling of the chat session teardown request received as a chat session BYE in the terminating network

6.1.14.1 Receiving of the chat session BYE request

Following differences with [TS29.311]:

- The handling described in chapter 6.1.6.1 of [CPMIW] and the differences and clarifications given for that section in [CPMIWENDORSE] will be taken into account as well

As a clarification for RCS:

- Operator policy for RCS will be to inform the SMS user of the chat session tear down

6.1.14.2 Sending of the SMS-DELIVER (over CS/PS or IP)

No differences with [TS29.311].

As a clarification for RCS:

- The case where the SIP INVITE request contains a Privacy header field with "header" or "user" or "id" is not applicable for RCS. Operator policy will not allow this

6.1.14.3 Receiving of SMS-DELIVER-REPORT (over CS/PS or IP)

6.1.14.3.1 Receiving of SMS-DELIVER-REPORT over CS/PS

No differences with [TS29.311].

6.1.14.3.2 Receiving of SMS-DELIVER-REPORT over IP

No differences with [TS29.311].

6.1.14.4 Sending of the chat session BYE response

No differences with [TS29.311].

6.1.15 Handling of the chat session teardown request received as a short message in the originating network

Following differences with [TS29.311]:

- The handling described in chapter 6.1.6.2 of [CPMIW] and the differences and clarifications given for that section in [CPMIWENDORSE] will be taken into account as well

6.1.16 Handling of the chat session teardown request received as a chat session BYE in the originating network

6.1.16.1 Receiving of the chat session BYE request

Following differences with [TS29.311]:

- The handling described in chapter 6.1.6.1 of [CPMIW] and the differences and clarifications given for that section in [CPMIWENDORSE] will be taken into account as well

As a clarification for RCS:

- Operator policy for RCS will be to inform the SMS user of the chat session tear down

6.1.16.2 Sending of the SMS-SUBMIT

No differences with [TS29.311].

As a clarification for RCS:

- The case where the SIP INVITE request contains a Privacy header field with "header" or "user" or "id" is not applicable for RCS. Operator policy will not allow this

6.1.16.3 Receiving of SMS-SUBMIT-REPORT (over CS/PS or IP)

No differences with [TS29.311].

6.1.17 Handling of Participant Information

6.1.17.1 General

No differences with [TS29.311].

6.1.17.2 Subscribing to Participant Information

Following differences with [TS29.311]:

- The handling described in chapter 6.1.7 of [CPMIW] and the differences and clarifications given for that section in [CPMIWENDORSE] will be used rather than relying on the description in [CPMCONVFUNC]

6.1.17.3 Receiving of a Participant Information Notification

Following differences with [TS29.311]:

- The handling described in chapter 6.1.7 of [CPMIW] and the differences and clarifications given for that section in [CPMIWENDORSE] will be used rather than relying on the description in [CPMCONVFUNC]

6.1.17.4 Sending Participant Information as SMS-Deliver when interworking in the terminating network

No differences with [TS29.311].

As a clarification for RCS:

- For participants that are identified by a TEL URI or a SIP URI with a "user=phone" parameter, that is all RCS users according to [RCS5.1], the participant will be identified with his MSISDN rather than a URI in the TP-UD

6.1.17.5 Sending Participant Information as SMS-SUBMIT when interworking in the originating network

No differences with [TS29.311].

As a clarification for RCS:

- For participants that are identified by a TEL URI or a SIP URI with a "user=phone" parameter, that is all RCS users according to [RCS5.1], the participant will be identified with his MSISDN rather than a URI in the TP-UD

6.1.18 Common procedures for chat session interworking

6.1.18.1 Determining if a received short message is associated to a chat session

No differences with [TS29.311].

6.1.18.2 Leaving a chat session

No differences with [TS29.311].

6.1.18.3 Sending SMS-DELIVER – common procedures

6.1.18.3.1 General

No differences with [TS29.311].

6.1.18.3.2 Sending of SMS-DELIVER over CS/PS

No differences with [TS29.311].

6.1.18.3.3 Sending of SMS-DELIVER over IP

Following differences with [TS29.311]:

- In item d) for RCS the IP-SM-GW will learn the MSISDN of the receiver out of the SIP INVITE request itself rather than out of the subscriber data from the HSS

6.1.18.4 Sending SMS-SUBMIT – common procedures

No differences with [TS29.311].

6.1.18.5 Sending SMS-DELIVER-REPORT

No differences with [TS29.311].

ANNEX A: Impacts of TP Parameters in a Short Message on Service Level Interworking

A.1.   Scope

No differences with [TS29.311].

A.2.   TP-Data-Coding-Scheme (TP-DCS)

No differences with [TS29.311].

A.3.   TP-User-Data Header Information Elements (UDH-IE)

No differences with [TS29.311].

A.4.   TP-Protocol-Identifier (TP-PID)

No differences with [TS29.311].

Document Management

Document History

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