RCS Pre-Universal Profile
Version 1.0
30 June 2016

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Contents

1 Introduction

1.1 Purpose of the document

This document provides guidance to OEMs, Application Developers and RCS platform and hub developers on two separate areas:

- Implementation of the RCS Pre-Universal profile, a set of mandatory features, as an backwards compatible evolution of the Joyn RCS profiles (Joyn Blackbird and Crane Priority Release), and,
- Implementation of features from the Joyn RCS Crane profile (based on and compatible with the Global Common Core 2.0), which are out of scope of this Pre-Universal profile. To facilitate the transition these will be re-instated as part of the final RCS Universal profile, referred to as Universal Profile Baseline Features.

Note the present document has been developed by those operators supporting and/or commercialising RCS Joyn profiles.

1.1.1 Structure of the document

The document is divided into two main sections consistent with the introduction given in the previous section:

- Section 2 focusing on the RCS Pre-Universal profile Product Description Document (PDD) details how mandatory features are to be implemented in regards to the Functional Requirements and includes technical specification references and details that may influence how certain functions behave, creating an overall guide for developers.
    - Chapter 2.2 covers discovery and activation.
    - Chapter 2.3 covers capability discovery and service availability.
    - Chapters 2.4 to 2.12 detail the major services.
    - Chapters 2.14 and 2.16 address Security and RCS Settings.
- Section 3 detailing RCS Universal Profile Features which are not part of the initial RCS Pre-Universal profile:
    - Section 3.9 covers Backup & Restore
    - Section 3.13 details extensions through APIs extensions
    - Section 3.15 provides requirements on Data Off.

Note the original numbering used in the Joyn Crane PDD and Global Common Core that associates a feature to a numeric chapter are maintain with the only addition of the section 2 or 3 numbering.

Each feature is structured into three parts: a user story that shall explain the user's view of the feature, the context and the benefit or the rationale why the feature makes sense. The second part lists the requirement(s), which describe how the user story shall be delivered to match the expectations. The final part is the technical implementation which maps to or explains how to use the supporting technical specification.

1.1.2 RCS Pre-Universal profile client scope

The RCS Pre-Universal profile client scope is covered in section 2 and can be delivered in two ways for users:

1. Implemented natively within the device by the Original Equipment Manufacturer (OEM) or OS Developer, tightly integrating the capabilities and services within the address book and many other native touch points across the device.
2. Implemented as an application that can be downloaded from Application stores or pre-installed and accessible as a separate application on the user's device, usually within the device's application folder or it's desktop.

In most cases, implementation of features is identical for both native and downloadable clients and this document for the most part will not differentiate between the two. In those cases where implementation of a feature in a downloadable client differs from the native experience, this may be described separately within the relevant section.

Finally and beyond the features contained in section 2 a client may implement the features in section 3 as in anticipation to the publication and general availability of the full RCS Universal Profile.

1.2 Reference Table

Ref	Doc Number	Title
[1]	[3GPP TS 22.140]	3GPP TS 22.140, release 10, Multimedia Messaging Service (MMS); Stage 1 http://www.3gpp.org/DynaReport/22140.htm
[2]	[3GPP TS 23.040]	3GPP TS 23.040, release 10, Technical realization of the Short Message Service (SMS) http://www.3gpp.org/DynaReport/23040.htm
[3]	[3GPP TS 24.008]	3GPP TS 24.008, release 10, Mobile radio interface Layer 3 specification; Core network protocols; Stage 3 http://www.3gpp.org/DynaReport/24008.htm
[4]	[3GPP TS 24.167]	3GPP TS 24.167, release 12, 3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; 3GPP IMS Management Object (MO) http://www.3gpp.org/DynaReport/24167.htm
[5]	[CAB_TS]	OMA Converged Address Book (CAB) Specification, Approved Version 1.0, 13 November 2012 http://www.openmobilealliance.org
[6]	[PRESENCE2MO]	OMA Management Object for Presence SIMPLE 2.0, Approved Version 2.0, 10 July 2012 http://www.openmobilealliance.org
[7]	[SUPLMO]	OMA Management Object for SUPL, Candidate Version 2.0 – 27 Jan 2011 http://www.openmobilealliance.org/

Ref	Doc Number	Title
[8]	[XDMMO]	OMA Management Object for XML Document Management 1.1, http://www.openmobilealliance.org
[9]	[NG.102]	IMS Profile for Converged IP Communications Version 2.0 04 January 2016 http://www.gsma.com/
[10]	[OMA-MMS-CONF]	OMA MMS Conformance Document Version 1.3 28 January 2008 http://www.openmobilealliance.org
[11]	[PRD-IR.51]	IMS Profile for Voice, Video and SMS over Wi-Fi Version 2.1 13 August 2015 http://www.gsma.com/
[12]	[PRD-IR.58]	IMS Profile for Voice over HSPA Version 7.0 11 March 2015 http://www.gsma.com/
[13]	[PRD-IR.67]	GSMA PRD IR.67 - “DNS/ENUM Guidelines for Service Providers & GRX/IPX Providers” Version 10.0 24 April 2014 http://www.gsma.com/
[14]	[PRD-IR.92]	GSMA PRD IR.92 - “IMS Profile for Voice and SMS” Version 9.0 8 April 2015 http://www.gsma.com/
[15]	[PRD-IR.94]	GSMA PRD IR.94 - “IMS Profile for Conversational Video Service” Version 10 22 October 2015 http://www.gsma.com/
[16]	[RCC.07]	GSMA PRD RCC.07 version 2.0- “Rich Communication Suite 5.1 Advanced Communications Services and Client Specification” 03 May 2013 http://www.gsma.com/
[17]	[RCS5.3]	GSMA PRD RCC.07 version 6.0 - “Rich Communication Suite 5.3 Advanced Communications Services and Client Specification” 28 February 2015 http://www.gsma.com/
[18]	[RCS6.0]	GSMA PRD RCC.07 version 7.0 - “Rich Communication Suite 6.0 Advanced Communications Services and Client Specification” 21 March 2016 http://www.gsma.com/
[19]	[RCC.09]	GSMA PRD RCC.09 RCS 6.0 Endorsement of OMA CPM 2.1Message Storage, Version 6.0

Ref	Doc Number	Title
		18 March 2016 http://www.gsma.com/
[20]	[RCC.11]	GSMA PRD RCC.11 Rich Communication Suite 5.3 Endorsement of OMA CPM 2.0 Conversation Functions Version 5.0 18 March 2016 http://www.gsma.com/
[21]	[RCC.12]	GSMA RCS 5.1 Endorsement of OMA SIP/SIMPLE IM 1.0, Version 1.0 13 August 2012 http://www.gsma.com/
[22]	[RCC.14]	GSMA PRD RCC.14 Service Provider Device Configuration Version 3.0 18 March 2016 http://www.gsma.com/
[23]	[RCC.15]	GSMA PRD RCC.15 IMS Device Configuration and Supporting Services Version 2.0 18 March 2016 http://www.gsma.com/
[24]	[RCC.20]	GSMA PRD RCC.20 Enriched Calling Technical Specification Version 2.0 18 March 2016 http://www.gsma.com/
[25]	[RCC.53]	GSMA PRD RCC.53 joyn Device API Specification Version 4.0 01 March 2016 http://www.gsma.com/
[26]	[RCC.55]	GSMA PRD RCC.55 [TAPI-Security]: RCS Extensibility: Terminal API Security Version 2.0 20 February 2016 http://www.gsma.com/
[27]	[RCC.60]	Blackbird Product Definition Document, Version 5.0, 17 August 2015 www.gsma.com
[28]	[RCC.61]	GSMA PRD RCC.61 RCS Common Core 1.1 Service Description Document Version 2.0 04 March 2015 http://www.gsma.com/
[29]	[RFC2425]	A MIME Content-Type for Directory Information IETF RFC http://tools.ietf.org/html/rfc2425
[30]	[RFC2426]	vCard MIME Directory Profile IETF RFC http://tools.ietf.org/html/rfc2426

Ref	Doc Number	Title
[31]	[RFC5547]	A Session Description Protocol (SDP) Offer/Answer Mechanism to Enable File Transfer IETF RFC http://tools.ietf.org/html/rfc5547
[32]	[vCard21]	vCard, The Electronic Business Card, A versit Consortium Specification, 18 Sep 1996 http://www.imc.org/pdi/vcard-21.doc
[33]	[joyn-Guidelines]	Joyn Implementation Guidelines http://www.gsma.com/

1.3 Conventions

It is a shared understanding by the standardising RCS Operators that any service described in the RCS standard may or may not be offered by any given Operator. However, it is agreed that if a feature is supported by an Operator or client, the Feature Requirements shall be supported as described by the RCS Pre-Universal profile PDD.

NOTE: For device manufacturers and client developers, requirements are classified based on the conventions defined in section 1.4 of this document.

Some additional information to clarify the requirement or User Story is presented as NOTES. Individual NOTES are not numbered. Content in NOTES shall not be considered as compulsory requirements as described in chapter 1.4 of this document.

1.4 Requirement and Technical Realisation Classification

Term	Description
Shall/Shall Not, Must/ Must Not	These terms dictate that a functionality and/or process is **Mandatory**
Required	These terms dictate that a functionality and/or process is **Mandatory**
Should/Should Not	This term dictates that the functionality and or/process is **Highly *Recommended***
Recommended	This term dictates that the functionality and or/process is **Highly *Recommended***
May	This term dictates that the functionality and or/process is **Nice to Have**
Optional	This term dictates that the functionality and or/process is **Nice to Have**

Table 1: Requirements Classification

1.5 Terms and Abbreviations

Term	Description (contains technical and functional terms)
Aggregation of device capabilities	All of a user's capabilities for their RCS services on all of their RCS-enabled devices will be combined into a single set of capabilities which is shared with other users. Other users will not be able to determine on exactly which device another user has a specific capability, nor will other users know whether the user has multiple RCS devices available to them at all (using this capability information shared).
A-Party	The party that initiates a communication event e.g. creates and sends a chat message or File Transfer or initiates a call to the B-Party.
App	Smartphone application.
App ID	Unique identifier for an application.

Term	Description (contains technical and functional terms)
Auto-Accept	A function on the device that shortcuts the user manual acceptance of the incoming communication event (such as chat, files etc.).
BB	Blackbird release of the joyn profile
B-Party	The party that receives or is intended to receive a communication event e.g. Chat Message, File Transfer or call from the A-Party.
Call Composer	A view on the device that allows the A-Party to enrich outgoing calls with pre-call content before placing the call.
Call Log	The view on the device displaying all the user's call events, i.e. incoming, outgoing, and missed calls. Call logs usually offer a view containing call events ordered chronologically, plus a detailed view of a single call event or call events with a specific contact.
Capability / Availability	A contact has a device registered for an RCS service that can initiate or respond to a requested RCS service.
CFB	Call Forward Busy.
CFS	Client Fallback to SMS incl. Revocation, a procedure defined in the context of "Delivery Assurance"
Chat Message	A single text message that was conveyed from one user to another using the RCS Chat service.
CLIP	Calling Line Identification Presentation.
Common Message Store (CMS)	A network storage that enables Multi-Device and Backup and Restore use cases.
Contact	A contact is a communication partner either selected from the device contact list or typed into the dialler as a phone number.
Contact Card	The details of a single contact which are displayed whenever a contact is selected from the contact list.
Conversation History	A list of all the content exchanged between parties of a conversation.
CPR	Crane Priority Release, Crane 3.0 version of the joyn profile
Crane	Crane release of the joyn profile
CS	Circuit Switch.
CW	Call Waiting.
Default Messaging Client	In the case of multiple messaging clients on a device, the client chosen by the user to act as the default messaging client for messaging notification and message composing purposes.
Delivery Assurance	RCS process to enhance the likelihood of RCS message and file transfer delivery. Includes the procedures of Client Fallback to SMS incl. Revocation and Network Fallback to SMS.
Delivery Notification	Indication that a message was successfully received by the B-Party device.
DELIVERY TIMEOUT	A duration parameter set by the operator which triggers the RCS application to perform an action if the Delivery Notification of the receiving device has not been confirmed within the set time.
Developer	Application owner.
Developer ID	ID assigned to application owner. It is not the same as the App ID.
Display Notification	Indication to the A-Party that the B-Party's device has displayed the message.
DTMF	Dual Tone Multi-Frequency.
Emoji	Emoji are "picture characters," that is, characters presented as pictographs, images of things such as faces, weather, vehicles and buildings, food and drink, animals and plants or icons that represent emotions, feelings, or activities.
Emoticon	A graphical 'mood' element that technically is corresponding with a text string. The text string is conveyed by the standard, and interpreted on UI level and replaced with the corresponding graphical element.
Enriched Calling / Enriched Content	Functionality described in this document which allows the user to enhance the standard ('plain') voice call experience.
EPC	Evolved Packet Core

Term	Description (contains technical and functional terms)
External Loudspeaker	Speaker on the device which amplifies the audio of the call when activated.
Feature Tag	An IARI Tag assigned to a RCS functionality allowing to identify and route the RCS traffic invoked by those apps through APIs.
Front Camera	Camera placed on the display side of a communication device.
GBA	Generic Bootstrap Architecture
Inactive device or Interface	A device or interface not currently active for a given session in a multi-device scenario.
Interconnected RCS Service	An RCS Service that can be accessed between users of network Operators supporting the same RCS Service capabilities.
Interface	Any entity that provides RCS Service capabilities to a user, e.g. browser-based, app-based, natively implemented.
IMSI	International Mobile Subscriber Identification.
Integrated Messaging	An Operator Messaging Service whereby the different message types are proposed to the end user, threaded together in a conversation and can be changed by the user. In this experience the message type used to deliver a message is indicated to the user
Messaging event	Includes all types of messages, files, content, new message notifications, previews, icons and message status notifications (sent and received).
MNO	Mobile Network Operator.
MSISDN	Mobile Subscriber Integrated Services Digital Number, i.e. mobile phone number.
Native RCS Device	A device with an RCS client deeply integrated by the OEM or OS developer (as opposed to a downloaded RCS client).
NFS	Network Fallback to SMS, a procedure defined in the context of “Delivery Assurance”
OEM	Original Equipment Manufacturer.
Off-Net	Communication or signalling that does go across the interworking interface (NNI) between networks or networks Operators.
“offline” user	A user who is known to be RCS enabled and not currently registered to the RCS service.
On-Net	Communication or signalling that does not go across the interworking interface (NNI) between networks or networks Operators.
“online” user	A user who is known to be RCS enabled and is currently registered to the RCS service.
Operator Messaging	Integration of all Operator Messaging Services into one single application. There are two options for Operator Messaging: “Integrated Messaging” and “Seamless Messaging.”
Operator Messaging Services	One or more services from traditional messaging services (SMS, MMS) or RCS services (Chat, File Transfer, Audio Messaging, vCard Push, Geolocation Push).
Operator RCS Substitution Client (ORSC)	A downloadable RCS messaging client that is developed and/or approved by an MNO. An ORSC may or may not bring its own stack. An ORSC can be configured as the default messaging client.
PDD	Product Description Document
Plain Voice Call	A voice call with no enriched content.
Primary Device or Primary Interface	Device which contains the SIM that matches the identity which the client uses to register to the IMS.
RCS activated	The RCS service has been successfully set-up by the network and the user (e.g. T&C) and is exposing its services to the user.
RCS Alias name	A name that is defined by the A-Party user that represents the A-Party user as a Chat participant on B-Party devices, if no Contact exists in the contact list.

Term	Description (contains technical and functional terms)
RCS Client	A native or downloaded piece of software running on a device which provides the user with all features of a certain RCS/joyn release (as far as a platform permits) and which has been accredited by the GSMA.
RCS deactivated	The RCS service has been deactivated by the user via the Master Switch. In this state, some or all of the RCS enablers are disabled.
RCS device enablers	RCS device enablers are functions/routines that are essential to the operation of RCS services but which are not transparent to the user. RCS enablers are: • Provisioning request • Registration • Capability discovery • IMS stack • Terminal APIs
RCS-enabled	Capable of the RCS service, activated and ready to operate when the network conditions allow.
Rear Camera	Opposite to the front camera- positioned on the back of the device.
Seamless Messaging	An Operator Messaging Service whereby the user is not aware of the messaging technology used but the device / network determines which messaging technology is used.
Service availability	Service availability is a state of a specific user that is determined using Capability Discovery processes.
SDD	Service Definition Document – a document that describes the User Stories, Requirements and Technical Implementation Details of specific RCS services.
Smileys	Smileys are small graphical elements that can express mood, fun or icons to explain a thing or a status in a graphical, easy to use and understand manner. Example for smileys are☺,☎ 💣 and☯.
Third Party RCS Client (3RC)	A client that provides RCS messaging and that is developed and/or approved by a third party using RCS APIs. A 3RC can be configured as the default messaging client. A 3RC cannot bring its own stack.
Thread (or messaging thread)	A thread (or “messaging thread”) is the history of all messages or files exchanged in past between two users, including message exchanged in past which are not part of the current conversation. This notion can be extended to Group, and then represents exchanges between all participants of the group.
UI	User Interface.
Value Added RCS Application (VARA)	An application that uses RCS services for exchange of information but provides a different service to the user (e.g. game, Field sales support etc.). A VARA cannot be configured as the default messaging client.
VoLTE	Voice over Long Term Evolution.
ViLTE	Video over Long Term Evolution.
xMS	The traditional Operator Messaging Services known as Short Message Service (SMS) and Multimedia Messaging Service (MMS).

2 Profile Features

2.1 Overview

This section describes the features that are part of this profile. Within the hierarchy of this section it follows the section numbering of [RCC.61].

2.2 Device Provisioning

2.2.1 Description

An Operator may provision different services for different users and/or devices based on internal policies (e.g. having an active subscription to one service). In the device provisioning phase, the services that are allowed for that user are configured on the device.

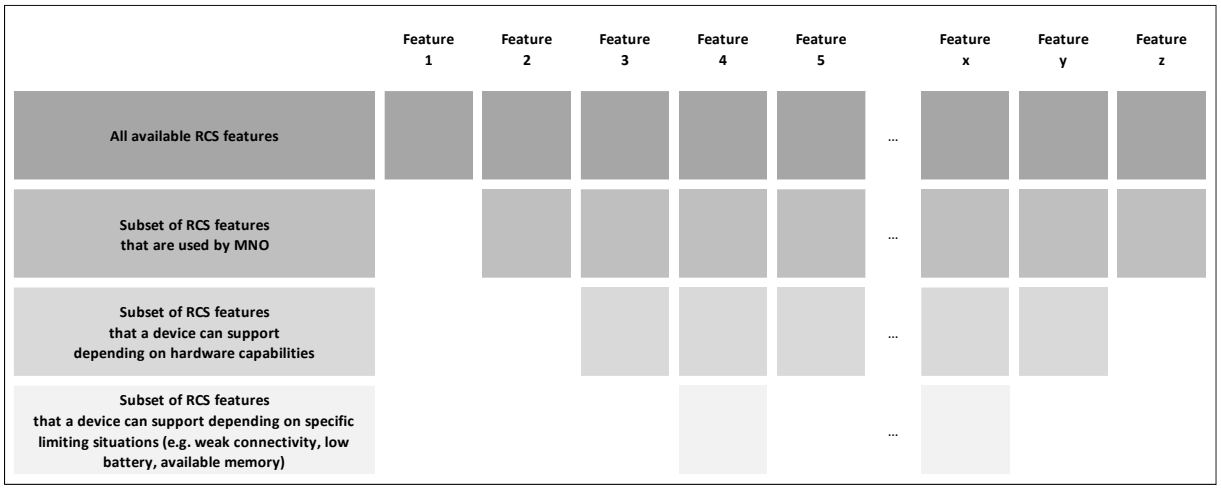

Figure 1: RCS features and their availability depending on Operator choice, device capability, and specific limiting situations.

Native RCS implementation shall start the activation process automatically when one of the triggers listed below occurs, unless certain conditions are fulfilled that prohibit activation depending on the trigger that occurred. The triggers for the activation of RCS are:

1. First start
2. Factory reset
3. SIM swap
4. Firmware update (FOTA)
5. Re-activation of RCS via the Master switch
6. Reception of a provisioning request pushed by the network
7. Provisioning response sent by the network that revokes a former service suspension.

The conditions that prohibit the activation process if certain of the triggers above occur are:

1. RCS was deactivated by the user via the Master switch in order to suspend the service or to use another RCS app.
2. The service has been disabled by the network, e.g. if the user had not accepted terms and conditions.
3. The device has been automatically disabled after the user denied acceptance of terms and conditions via the provisioning mechanism.

2.2.2 User Stories and Feature Requirements

2.2.2.1 Configuration of the user´s primary device by requesting user identity

US2-1 **As an Operator, I want my RCS users to verify their identity before they use the RCS service**

R2-1-1 Only automatic identification shall be used when triggering automatic activation of RCS services.

R2-1-2 When user activates the service by turning on the master switch and automatic identification of the user is not possible, the user shall be prompted to provide (manually type in) the MSISDN. To do so, a User Message (e.g. pop-up) shall be displayed.

NOTE**:** Automatic authentication method should always prevail when available, therefore, even if manual identification method has been triggered (but not completed) because on non-cellular coverage (Wi-Fi), when moving to cellular data coverage the set-up process should be re-triggered.

R2-1-2-1 Before the user is prompted to enter their MSISDN, they shall be informed why they are being asked to do so (e.g. Explain that the messaging app will include the Chat and File transfer).

R2-1-2-2 User shall have the option to skip the process. Once the user has selected to skip manual identification, only automatic identification should be retried.

R2-1-3 To ensure validity of the provided MSISDN, a verification process shall take place:

R2-1-3-1 A silent SMS with a password is sent to the device.

R2-1-3-2 This SMS shall be intercepted by the RCS provisioning process and verified.

R2-1-4 When the verification process has been completed successfully, the provisioning process shall be completed without any further user interaction.

R2-1-5 If the SMS takes too long or is never received (e.g. because the network does not deliver the SMS properly or the user provided a wrong MSISDN), the user shall be presented with a screen informing them that the process cannot be completed at this stage.

R2-1-6 In this case, the user shall be informed about the previously given MSISDN (so that the user can amend it if necessary) and shall be provided with the means to retry.

NOTE: This procedure (R2-1-6) can be attempted a maximum of 3 times after which manual Wi-Fi provisioning is stopped but automatic provisioning is still possible.

R2-1-7 If the maximum number of attempts for manual identification is exceeded, the user should be presented with a screen informing them that the process cannot be completed at that moment.

US2-2 **As a user, I want to seamlessly use RCS services after I bought a new RCS enabled smartphone.**
As a user, I want to start using my RCS services independently of the connectivity status (Wi-Fi or cellular coverage) of my device while setting up the (new) device or downloading an RCS client.

NOTE: It is an accepted restriction that device provisioning does not happen if there is no data connectivity).

R2-2-1 When the user activates RCS over a network that allows automatic authentication, then provisioning of the service and configuration of the device shall be done without any user interaction. However, there are three exceptions, covered in R2-4-1 and R2-5-1.

R2-2-2 In any case, where the network hasn't been able to identify the user automatically, the device will enter into the process which describes the configuration of the user´s device by requesting the identity of the user via manual submission of the MSISDN.

2.2.2.2 Downloadable RCS applications / Multiple RCS instances

US2-3 **As a user, I want and use as many RCS clients (native, ORSCs, 3RCs) and applications (VARAs) as I choose.**

R2-3-1 It shall be possible for multiple RCS clients and Value Added RCS Applications (VARAs) to be active and working at the same time on a device.

R2-3-1-1 Only one RCS client shall manage the user notifications of incoming xMS and RCS messages at a time and act as the default client for composing messages. This shall be known as the default messaging client.

R2-3-1-2 If more than one RCS client is active and working at the same time, the user shall be able to choose which one of these RCS clients will act as the default messaging client.

R2-3-1-2-1 A "Default Messaging Client" setting (e.g. toggle list) shall be made available in the device (see US16-16 and subsequent requirements).

NOTE: Legacy messaging clients not supporting RCS shall not be able to operate as the default messaging client.

R2-3-1-3 When an RCS client is set up and/or activated, the user may be asked whether they would like to set that RCS client as the default messaging client. This could be done via direction to the "default messaging client" setting (e.g. toggle list). If a user is not asked, the existing RCS client managing the user notifications and acting as the default messaging client shall continue to operate as such.

R2-3-1-4 RCS and xMS messages and content may be displayed and made available from some or all of the active RCS clients and applications on a device.

R2-3-1-5 User notifications of app to app traffic shall continue to be managed only by the app responsible for that particular app to app traffic, whichever client is chosen as the default messaging client.

R2-3-2 The native RCS client's stack shall provide access to RCS Terminal APIs (T-API) to any authorised application wishing to use RCS services on behalf of the user.

R2-3-3 In certain circumstances, an ORSC may install and use its own RCS stack on the device instead of the native RCS stack (e.g. this could be because there is no native stack present on the device, or the stack on the device is not suitable or needs to be upgraded to provide new functionality). In this case:

R2-3-3-1 The ORSC shall be able to detect whether a native RCS stack exists already and if so whether RCS T-APIs are exposed by this native implementation and which T-API version.

If it is deemed appropriate to enable the ORSC's RCS stack, then:

R2-3-3-2 The newly installed RCS stack brought by the downloaded app shall disable the operation of the existing active stack or prompt the user to confirm this action if it is not possible to do this automatically.

R2-3-3-3 When the native RCS stack is disabled, the Master Switch shall be switched off. The user shall be able to enable it again by switching the Master Switch position to "ON".

R2-3-3-4 The newly installed RCS stack included in the downloaded app should expose standard APIs to any other application already using or authorised to use the RCS APIs on that device.

R2-3-3-4-1 Access to the new RCS stack's APIs shall be managed by the same mechanism in place for native API access.

R2-3-3-4-2 Any application using the previously active RCS stack's APIs shall continue to use the new stack's API in a seamless way, i.e. without disrupting the user experience.

R2-3-3-5 If an ORSC has included and activated its own RCS stack on the device, upon removal or disabling of the ORSC, any previously native RCS stack that was disabled by the ORSC shall be enabled again, or the user shall be prompted and guided on how to do so if automatic enabling is not possible.

R2-3-3-6 The user prompt to reset the Master Switch (to "ON") shall include a 'don't show again' function to give the user the ability to limit the number of prompts presented.

NOTE1: The use of RCS T-APIs is controlled by a security framework based on certificates issued by MNOs and OEMs. This framework must not be implemented by a 3RC or a VARA, it can only be provided by the native client/stack or an ORSC.

NOTE2: Any ORSC, 3RC or VARA downloaded to the device should use the APIs provided by the native stack.

An RCS native implementation may enter into the following states depending on certain conditions:

R2-3-4 Factory state: Native RCS on a device has not been provisioned yet or factory reset has been applied by the user. This is the out-of-the-factory status of RCS before any connection to the network has occurred. Once connectivity is established, the device enters the set-up process.

R2-3-5 RCS on set-up process: The RCS service activation process is in progress. It is not yet visible on the device but HTTP requests are active.

R2-3-6 RCS disabled: Native RCS on a device has not been successfully provisioned or has been deactivated by the Operator. This state is entered after provisioning failed deliberately, e.g., when an Operator denied provisioning of a RCS device since its user is not entitled to use the service, or due to technical failure. This state is also entered when an Operator decides to deactivate RCS on a device, e.g. if a user is no longer

entitled to use the service.
In this state RCS services are not visible on the UI (respective entry points and message history are not presented) and the RCS enablers; IMS stack, register and capability discovery are disabled. The handling of auto provisioning depends on the exact reason for moving into this state, which leads to more sub states (for more details please refer to the RCS specification). However, one or more of the mentioned RCS enablers might be active if utilised by other services (e.g. VoLTE, which uses the same IMS stack, is active).

R2-3-7 In the event of a SIM swap, if a valid configuration associated to the SIM is available in the device then it shall be used; otherwise, the device enters the RCS on set-up process. Independent of the outcome, user data (e.g. configuration, messages, contacts etc.) shall not be deleted from the device in the event of a SIM swap.

R2-3-8 RCS in launcher mode: This state applies only for those networks that require the user to accept the Terms & Conditions. It is considered highly likely that a user that rejected those Terms & Conditions on the first device start-up learns later about RCS and wants to activate it. The RCS Master Switch shall be visible in this state, and if switched to “ON”, will trigger the RCS set-up process.

R2-3-9 RCS active: RCS is configured and active on the device. Capabilities are exchanged, all entry points enabled and all available RCS services active.

R2-3-10 RCS deactivated: This state is entered if the user has deactivated RCS via putting the Master switch to “OFF”. In this state the native RCS services are inactive, all its entry points with the exception of the Master switch are disabled (inactive or not shown) and all its user related content is available (Chat history, files, etc.). However, one or more of the mentioned RCS enablers might be active if utilised by other services (e.g. VoLTE, which uses the same IMS stack, is active). By clicking on the Master switch and switching it to “ON”, the native device’s RCS functionality can be re-activated.

R2-3-11 In all case in which the service shall be activated it must be assured that no conflict will arise with an active RCS app the user has installed (please refer to 2.2.2 Downloadable RCS application/ Multiple RCS instances).

The following table depicts the relationship between triggers and the conditions that rule automatic activation of RCS.

Triggers	Conditions		
	1. Deactivated by Master switch	**2.Disabled by network**	**3.Disabled automatically**
First start	N/A	N/A	N/A
Factory reset	Activate RCS and reset Master switch (to “ON”)	Activate	Activate RCS and reset Master switch (to “ON”)
SIM swap	• Case 1: if a valid configuration associated to the inserted SIM is available ignore the trigger • Case 2: if not trigger RCS activation process and reset Master switch (to “ON”).	• Case 1: if a valid configuration associated to the inserted SIM is available ignore the trigger • Case 2: if not trigger RCS activation process.	• Case 1: if a valid configuration associated to the inserted SIM is available ignore the trigger • Case 2: if not trigger RCS activation process and reset Master switch (to “ON”).
Firmware update	Ignore trigger	Ignore trigger	Ignore trigger
Reactivation via the Master Switch	Activate	Activate (Device in launcher mode)	Activate (Device in launcher mode)
Provisioning push	Ignore trigger	Activate	Activate
Network reactivation trigger	N/A	Activate	Activate

Table 2: Triggers and conditions that rule automatic activation of RCS

In cases, in which the service shall be activated but a downloadable RCS client was active before the trigger, the downloadable RCS client shall remain active. There are two exceptions:

1. the factory reset trigger and
2. the reactivation via Master Switch trigger.

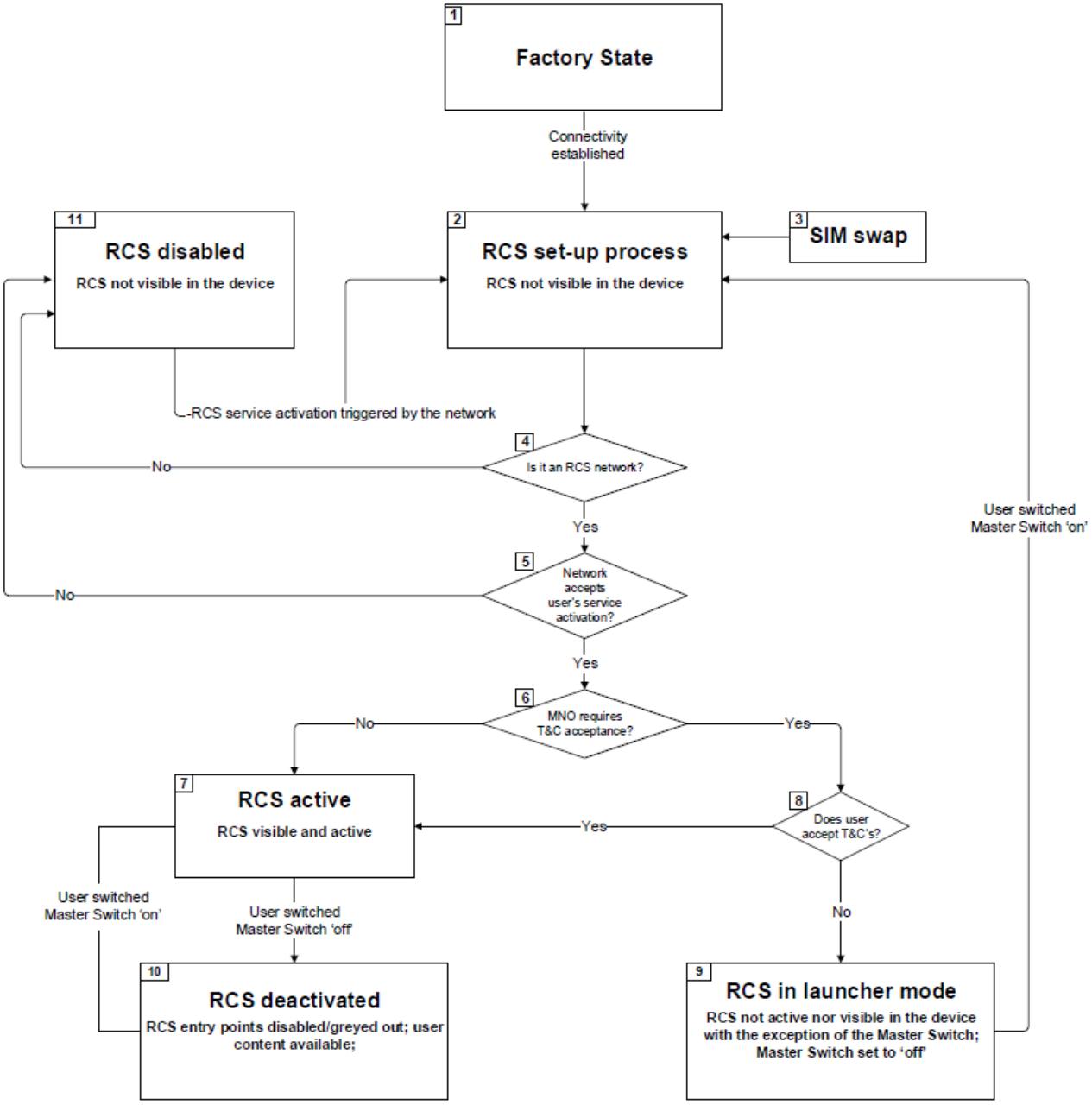

Figure 2: Status logic flow

Figure 2 is an illustrative overview of the key device states and not an exhaustive depiction of all possible states. For details, see R2-3-4 to R2-3-11.

2.2.2.3 User consent

An Operator may require that the user confirms their terms and conditions before the RCS service is made available to that user. If the Operator chooses to enforce this step, then the Operator will choose whether to prompt the user for confirmation using two buttons (e.g. "Accept"/"Reject"), or one button (e.g. "OK").

At any point after the service has been activated on the device, an Operator may require that further information be presented to the user. In this case, the Operator will choose whether the user will be asked to confirm the display of this information using either the one or two button method.

User Message

US2-4 **As an Operator, I want to be able to provide information and require consent BEFORE my users use the RCS service.**

R2-4-1 Upon Operator discretion a User Message (e.g. popup or toast) showing EITHER Terms & Conditions OR a Welcome Message (OR no User Message is shown) shall be displayed to the user during first-time configuration.

NOTE: Display of Terms & Conditions requires two buttons (e.g. “accept” & “decline”) for user action while display of Welcome Message requires only one button (e.g. “Ok”).

R2-4-2 The presentation of the messages must be clear to the user and not hidden within the notification tray for action. If the user needs to confirm consent, the confirmation screen should be displayed the first time the user access native messaging.

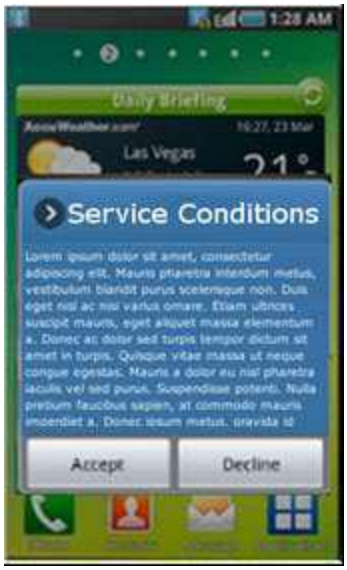

Figure 3: Example Terms & Conditions pop-up

NOTE: Ask for the user’s consent according to the requirement in context i.e. not a randomly shown pop up. However, if the user needs to confirm, then display the confirmation screen on the first time that the user accesses the native messaging experience.

R2-4-3 As soon as the user accepts the User Message, the RCS service shall be active on the device.

R2-4-4 If the user declines the Terms & Conditions, RCS services shall not be available on the device., The RCS client shall become inactive (RCS Master switch set to ‘disabled’) and not visible on the device with the

exception of the Master Switch that allows to re-enter the process (for details see R2-3-8).

R2-4-5 If the user declines, a retry algorithm shall be able to retrigger the service activation and the Terms & Conditions acceptance process (on RCS capable networks). The retry algorithm shall be a retry after one day, then after one week, then after one month, then end.

End User Confirmation Request

US2-5 **As an Operator, I want to be able to provide information and require consent from my users AFTER the RCS service has been activated**

R2-5-1 Upon Operator discretion, a popup showing a message (e.g. Terms & Conditions OR a Welcome message) shall be displayed to the user at any time after successful first-time registration.

R2-5-2 The display of that message shall be able to come with EITHER one OR two buttons for the user to respond.

R2-5-3 The Operator shall be able to determine the button texts (e.g. 'accept') of that popup.

R2-5-4 The responses to the message shall be relayed back to the network.

R2-5-5 The presentation of the message shall be clear to the user and not hidden within the notification tray for action, but be presented 'on top' of the screen.

R2-5-6 Depending on the response by the user, the network can send a trigger to deactivate the RCS services on the device, i.e. RCS services shall not be available on the device. The RCS client will become inactive and not visible or to put the device into the launcher mode in which the RCS Master Switch shall remain visible on the device (e.g. settings) to be able to re-enter the process of RCS activation.

R2-5-7 Upon Operator policies, additional messages may be displayed to the user.

US2-6 **As an Operator, I want to request additional information from my users during first-time registration in order to fulfil specific security purposes.**

R2-6-1 Upon operator discretion, users can be requested to enter additional information during first-time registration in order to fulfil specific security requirements set by the Operator.

NOTE: Details are covered in 'Security against Malware', see Section 2.14.

US2-7 **As a user, I want to have access to the text displayed as User Message and / or End User Confirmation Request at any time after being provisioned to the service.**

R2-7-1 The text displayed as User Message and / or End User Confirmation Request shall be accessible for the user after the user has started using the service (e.g. in Messaging Settings).

2.2.2.4 Service Introduction

US2-8 **As a user, I want the device to make me aware of new main functionalities added to my messaging app.**

R2-8-1 The user shall get an introduction to new features, e.g. chat and SMS integrated, Delivery and Read notifications, RCS File transfer through the chat service and Group chat.

NOTE: This information shall be OEM specific.

2.2.2.5 Error Management

US2-9 **As an Operator, I want technical errors to be handled with minimal user interaction.**
The user may get any of the following errors:

R2-9-1 Reception of SMS (see R2-1-2-1) takes too long or is never received.

NOTE: There are two possible causes:

1. The network does not deliver the SMS for whatever reason.
2. The user made a mistake when typing the MSISDN and the SMS is sent to a different device. In either case, the user shall be presented a screen informing them that the process is taking longer than expected. This screen shall contain a text box with the previously given MSISDN (so that the user can amend it if necessary) and a 'retry' button (final UI and text label is up to Operator discretion).

R2-9-2 The procedure in R2-9-1 can be attempted a maximum number of times according to the Operator's definition. It is recommended to set the maximum number to three to be consistent with R2-1-6.

R2-9-3 Temporarily unavailable: Applies to internal errors during configuration/provisioning or configuration server unreachable, as specified in section 2.3.3.2.4 of [RCC.07]. The device shall reattempt provisioning at a later stage (i.e. at the next device start-up)

R2-9-4 Permanently unavailable: In case the Operator does not want to provide RCS services to a particular subscription an Operator defined error message shall be displayed and the provisioning process is stopped.

R2-9-5 The user closes the MSISDN input field (e.g. by mistake) without providing any input: The user shall be presented the MSISDN input field a maximum number of three times while being not provisioned under non cellular connection. Further configuration attempts shall automatically start once the user connects to a cellular network.

2.2.2.6 Provisioning push

US2-10 **As an Operator, I want to be able to push configuration settings in special cases.**

Network initiated configuration request: Provisioning push will allow an Operator to force the reconfiguration of each user´s device if needed:

R2-10-1 The Operator shall be able to push configuration settings to new or existing RCS users (e.g. in the case of changing parameters).

R2-10-2 The Operator shall be able to push configuration settings in case the network is upgraded to a new RCS release.

R2-10-3 The Operator shall be able to push configuration settings when the device is permanently disabled but the user likes to start using RCS.

2.2.3 Technical Information

2.2.3.1 Management of active IMS stack

The requirements in section 2.2.2 require a mechanism to control which IMS stack is active (native or ORSC). Being device local the mechanism to support this will be OS specific. On Android™ it will be based on the following concepts:

- Identifying Android™ applications as RCS clients using a Manifest.xml meta-data property
- Identifying if a RCS client is enabled by accessing its Shared Preferences and reading a property from it.
- Accessing a RCS client settings screen by sending an intent using the action defined as a Manifest.xml meta-data property.

NOTE: In order to prevent having two RCS clients on the same device and, therefore, negative consequences in the user experience, the following mechanism shall be implemented by both native and ORSC client implementations. This mechanism is based on the following principles:

2.2.3.1.1 Client requirements

Android™ RCS clients shall define the following meta-data properties in their *Manifest.xml* file[1].

Name	Value	Description
gsma.joyn.client	true	Used to identify the application as an RCS client
gsma.joyn.settings.activity	<String>	Equals to the intent action that be used to start the RCS client settings screen

Table 3: Android RCS client Manifest meta-data properties

Android RCS clients shall define a settings screen activity that can be opened by third party applications by using a simple intent which action string is equal to the value of the "*gsma.joyn.settings.activity*" meta-data property. Sending that intent to open the settings screen shall require no permission. Thus, the user decides (or not) to deactivate the third party application.

The following example illustrates the meta-data that shall be added to the *Manifest.xml* file, as well as a sample settings screen activity.

[1] The naming of the parameters includes “joyn” for historic reasons to ensure compatibility with legacy joyn clients implementing the same mechanism for similar purposes. It is required to be provided regardless of whether the client implements a joyn profile.

```
<application
android:icon="@drawable/icon"
android:label="@string/app_name">

    <!-- the following meta-data is used to identify the application as an RCS client -->
    <meta-data android:name="gsma.joyn.client" android:value="true" />

    <!-- the following meta-data is used to provide the value of the intent action that can be
    used by other applications to start the RCS client settings screen -->
    <meta-data
            android:name="gsma.joyn.settings.activity"
            android:value="com.vendor.product.MyRCSSettingsActivity" />

    <!-- RCS client shall define a settings property such that it can be open by third party
    applications using an intent which action string corresponds to the meta-data value
    defined above -->
    <activity android:name=".MyRCSSettingsActivity">
        <intent-filter>
            <action android:name="com.vendor.product.MyRCSSettingsActivity" />
            <category android:name="android.intent.category.DEFAULT" />
        </intent-filter>
    </activity>
```

Table 4: Android meta-data usage

Every RCS client shall define a publicly readable Shared Preferences using the name "*pckgname.gsma.joyn.preferences*", where '*pckgname'* parameter shall be replaced with the client's unique package name of the application (no two applications can have the same package name on the Android market). Client shall add this to the manifest as a metadata:

```
<meta-data android:name="gsma.joyn.preferences"
android:value="pckgname.gsma.joyn.preferences" />.
```

The shared preferences shall be created using the RCS client application context, using the mode MODE_WORLD_READABLE.

The shared preferences shall contain a Boolean property named "*gsma.joyn.enabled*". This property can have two values:

1. True: It will mean that the RCS client is enabled (user switch in settings set to "ON") and the application has been provisioned successfully.
2. False (default value): It will mean that the RCS client is disabled (user switch in settings set to "OFF") or the RCS client has never been provisioned.

The RCS client will modify the value of these properties according to the rules defined in the following section.

2.2.3.1.2 Client start-up behaviour

An RCS client which is started for the first time on a device shall:

- Retrieve the list of installed applications from the Package Manager, and identify existing RCS clients by looking for the Boolean meta-data property named "*gsma.joyn.client*", as defined in the previous section.
- For every RCS client that is found, the client shall open their shared preferences named "*pckgname.gsma.joyn.preferences*" and retrieve the Boolean property "*gsma.joyn.enabled*", as defined in the previous section.

- If an existing RCS client is found with the Boolean property "*gsma.joyn.enabled*" set to "*True*", it means that client is already active on the device. The new client shall inform to the user that there is another RCS client already configured in the device and that as a pre-requisite to use this one, it is necessary to disable it. In the same pop-up the possibility to access the RCS settings of the active RCS application (via intent mechanism) shall be offered. The intent action used to open the active RCS client settings screen shall be retrieved by reading its Manifest meta-data property named "*gsma.joyn.settings.activity*".
- After disabling the active client, its settings screen shall be closed and the new client shall be given control again. The new client shall then perform these first time start checks again which would lead to the conclusion that there is no active client and that therefore the new client shall become the active client (see NOTE below).
- If there is no existing RCS client, or that none of them are enabled, the new RCS client may proceed with provisioning and registration. Once the client is successfully provisioned and registered to the network it shall open its own "*pckgname.gsma.joyn.preferences*" shared preferences and set its own "*gsma.joyn.enabled*" property to "*True*".

If the RCS client is disabled (e.g. user switch in settings set to “OFF”) it shall open its own "*pckgname.gsma.joyn.preferences*" shared preferences and set its own "gsma.joyn.enabled" property to "*False*".

This start-up behaviour shall also apply when there is an attempt to re-activate the disabled client; and when the disabled client is re-started.

2.2.3.2 Implementation of Service Activation and Client Configuration

The implementation of client configuration and provisioning push for the profile defined in this document shall be provided based on the technical procedures defined in [RCC.14] and [RCC.15] and the following additional clarifications and requirements. The configuration parameters and their aligned values applicable to this profile shall be as defined in Annex B.

2.2.3.2.1 Service Provider Device Configuration

The configuration of clients complying with the profile defined in this document shall be implemented as defined in [RCC.14] with the following additional clarifications and requirements.

2.2.3.2.1.1 Configuration Request

The definitions for the configuration request parameters in sections 2.2.1 and 2.3.2 of [RCC.14] apply with the following additional clarifications and requirements:

- If the client is in "RCS dormant state" as defined in section 2.2.3.2.1.2 and a trigger for client configuration applies, the client shall send a configuration request as defined in [RCC.14] with the "vers" parameter set to "-3". This extends the definitions of the configuration request parameter "vers" of [RCC.14] by adding the value "-3" as a permissible value, indicating that the client is in "RCS dormant" state.
- The configuration request parameter "friendly_device_name" defined in [RCC.14] is not applicable for the profile defined in this document.

- In addition to the generic configuration request parameters defined in [RCC.14] the following RCS specific request parameters shall be supported by clients complying with the profile defined in this document:
- The client shall support for the configuration request the parameter "rcs_state" defined in section 2.3.3.2 of [RCS6.0] with the following clarifications and requirements.

    - When sending an initial configuration request when there is no existing configuration (e.g. out of the box or configuration XML document received with version parameter of the VERS characteristic set to "0"), then the client shall set the value of the "rcs_state" parameter to "0", in accordance with the definitions in section 2.3.3.2 of [RCS6.0]
    - If the client receives a configuration response with a configuration XML document with the version parameter of the VERS characteristic set to a positive integer value and with the RCS DISABLED STATE configuration parameter absent (see section A.1.1 of [RCS6.0]), then the client shall set the value of "rcs_state" in the next configuration request to the value received in the version parameter.
    - If the client receives a configuration response with a configuration XML document with the version parameter of the VERS characteristic set to a positive integer value and with the RCS DISABLED STATE configuration parameter present (section A.1.1 of [RCS6.0]), then the client shall set the value of "rcs_state" in the next configuration request as defined in section 2.3.3.2 of [RCS6.0].
    - If the client receives a configuration response with a configuration XML document with the version parameter of the VERS characteristic set to a negative integer value, then the client shall set the value of "rcs_state" in the next configuration request to "0".

- The client shall support for the configuration request the parameters "rcs_version", "client_vendor", "client_version" and "rcs_profile" as defined in sections 2.3.3.3.1 and 2.3.3.4.1 of [RCC.07]. Clients complying with the profile defined in this document shall set the value of the parameter "rcs_profile" to "pre_uni".
- The client shall support for the configuration request the parameter "default_sms_app" as defined in section 2.3.3.2 of [RCS6.0].

2.2.3.2.1.2 Configuration Server Response

The definitions for the configuration server response parameters in section 2.2.2 of [RCC.14] apply with the following additional clarifications and requirements:

- If a client complying with the profile defined in this document is connected to a legacy network, it may receive a client configuration response with a configuration XML document contain a VERS characteristic with a "version" parameter value set to "-3", e.g. as defined in section 2.3.3.2.2 of [RCC.07]. The value is used by the configuration server to set the client to "RCS dormant state". When receiving the version value "-3", the client shall apply the behaviour as defined in section 2.3.3.2.2 of [RCC.07].
- If a client complying with the profile defined in this document is connected to a legacy network, it may receive a client configuration response with a configuration XML document containing a "validity" parameter in the TOKEN characteristic, e.g. as

defined in section 2.3.3.2.2 of [RCC.07]. In this case the client shall respect the parameter value and apply the behaviour as defined in [RCC.07].

2.2.3.2.1.3 Client configuration using GBA Authentication

The user authentication using the 3GPP Authentication Centre (AuC) and the USIM or ISIM provides the highest level of security for the RCS application.

Support of the procedures defined in section 2.4 of [RCC.14] is optional for clients and networks supporting the profile defined in this document. The applicability of the procedures of section 2.4 of [RCC.14] for the client configuration request is determined by the procedure described in section 2.4.2.1 of [RCC.14].

The authentication via the bootstrapped security association is applicable for client implementations complying with the profile defined in this document if implemented natively within the device. The device implementation shall ensure that mechanisms to access authentication procedures of the SIM or ISIM, to generate a bootstrapped security association and the key material resulting from the bootstrapped security association are not accessible to clients and applications not being natively implemented within the device.

2.2.3.3 IMS Configuration and Supporting Services

Clients complying with the profile defined in this document shall implement the IMS configuration and supporting services as defined in [RCC.15]. For the applicability of the Configuration Parameters defined in section 2.2 of [RCC.15] refer to Annex B.

2.2.3.4 Technical Implementation of User Stories and Service Requirements

R2-11-1 R2-1-1 shall be realised locally on the device

R2-11-2 Provisioning on networks with automatic identification (see requirement R2-2-1) shall be done as described in section 2.2.3.2.1. If the network cannot authorise the user (as described in requirement R2-2-2) an HTTP 511 Response shall be returned as indicated in section 2.2.4 of [RCC.14], which shall (as indicated in [RCC.14]) result in the use of the procedures in section 2.3 of [RCC.14]. In that case if the IMSI is available, a device shall not ask the user for the MSISDN, and shall instead attempt the configuration providing only the IMSI in the HTTP request.

R2-11-3 Configuration over networks where automatic authentication is not possible (e.g. non-cellular networks) shall be realised using the HTTP mechanism as described in section 2.3 of [RCC.14] and its subsections providing the procedure required in requirements R2-1-2, R2-1-3, R2-1-3-1, R2-1-3-2, R2-1-4 and R2-9-1, with the error handling described in section 2.3.3.4 of [RCC.14] covering the behaviour required in R2-1-5 and R2-1-6. Requirements R2-1-2-1 and R2-1-2-2 shall be implemented locally on the device. The device shall assume that RCS is available on the user's network if DNS resolution of the HTTP configuration URL is possible using the MCC and MNC obtained from the SIM card. As described in section 2.3.2 of [RCC.14], if the IMSI is available, a device shall not ask the user for the MSISDN, and shall instead attempt the configuration providing only the IMSI. The Operator limitation required in R2-9-2 is covered by the NOTE in section 2.3.2 of [RCC.14].

R2-11-4 Requirement R2-1-7 shall be implemented locally on the device

R2-11-5 To ensure that multiple active RCS clients can work on a device at the same time and to ensure that only one client is the default messaging client active on a particular device (as required in R2-3-1 to R2-3-11) a device-local solution is required which will therefore be OS specific.

R2-11-6 For the Android™ OS this shall be implemented locally on the device and 3RCs and VARAs clients shall use the exposed APIs of the active and default messaging client, following RCS Device API.

R2-11-7 For requirement R2-3-1-1 the client shall follow the mechanism described in R2-11-2.

R2-11-8 Requirement R2-3-1-2 and the sub requirements shall be implemented locally on the device.

R2-11-9 During the set up process or immediately after the RCS client is activated, a message shall be displayed to the user requesting if the client should be the default messaging client. If no information is provided by the user the active RCS client as described in R2-3-1-3 shall continue to operate as the default messaging client.

R2-11-10 Requirement R2-3-1-4 shall be implemented locally on the device.

R2-11-11 Requirement R2-3-1-5 shall be implemented locally on the device using IARIs to identify the application traffic as defined in section 3.12.4.2 of [RCS6.0].

R2-11-12 Requirement R2-3-2 shall be implemented based on section 2.13 ‘API Extensions’.

R2-11-13 Requirement R2-3-3 and the sub requirements shall be implemented locally on the device.

R2-11-13-1 For requirement R2-3-3-1, the client shall follow the mechanism described in section 2.2.3.1 of this document.

R2-11-13-2 To disable the existing active stack as indicated in requirement R2-3-3-2, the client shall follow the mechanism described in section 2.2.3.1 of this document

R2-11-13-3 Requirement R2-3-3-3 shall be implemented locally on the device.

R2-11-13-4 Requirements R2-3-3-4, R2-3-3-4-1 and R2-3-3-4-2 shall be implemented locally on the device following section 4 of [RCC.55].

R2-11-13-5 For requirement R2-3-3-5, when the user re-enables an RCS client, a HTTP configuration request shall be done to verify whether the available version of the RCS configuration parameters are still valid.

R2-11-13-6 Requirement R2-3-3-6 shall be implemented locally on the device.

R2-11-14 Requirements R2-3-4 to R2-3-11 shall be implemented locally on the device with the Operator having the possibility to disable the RCS client as indicated in requirement R2-3-6 by setting the RCS DISABLED STATE configuration parameter in a provided configuration document to -1 as described in section 2.3.3.2 of [RCS6.0] or by setting the “version” parameter of the configuration response to -1 as described in section 2.2.3.2.1.2.

R2-11-15 To avoid conflict with the active RCS client on the device, an ORCS shall follow requirement R2-11-5. If the ORCS activates its own stack, section 2.2.3.1 of this document applies.

R2-11-16 The user consent before use of the service described in user story US2-4 shall be realised through the mechanism for providing User Messages in the HTTP configuration described in section 2.2.3 of [RCC.14]. This mechanism shall be supported by the RCS clients and may be used upon the Service Provider's discretion.

R2-11-17 As described in section 2.2.3 of [RCC.14] the User Message mechanism supports requirements R2-4-1 and R2-4-4.

R2-11-18 Requirements R2-4-2 and R2-4-5 shall be implemented locally on the device.

NOTE: The retry algorithm described is to be realised in the device. An Operator can opt for more retries through the Provisioning Push mechanism described in US2-10.

R2-11-19 For requirement R2-4-3 as defined the configuration shall be applied and the service shall be activated when the user presses the "Accept" button, moving to another screen shall be considered equivalent with this "accept" button action.

R2-11-20 The user consent after activation of the service described in user story US2-5 shall be realised through the mechanism End User Confirmation Request mechanism described in section 3.1 of [RCC.15]. This mechanism shall be supported by the RCS clients and may be used upon Service Provider discretion. No specific handling apart from the normal processing of End User Confirmation Requests is assumed to be provided on the device.

R2-11-21 As described in section 3.1 of [RCC.15] the End User Confirmation Request mechanism supports requirements R2-5-1, R2-5-2, R2-5-3 and R2-5-4. For requirement R2-5-2, in the case when one button is required, the End User Notification Request described in section 3.1.3 of [RCC.15] shall be used. For a message requiring two buttons, the End User Confirmation Request and Response described in section 3.1.1 and 3.1.2 of [RCC.15] respectively shall be used.

R2-11-22 Requirement R2-5-5 shall be implemented locally on the device

R2-11-23 For requirements R2-5-6 the network shall disable the RCS client by triggering a client reconfiguration using the procedure defined in R2-11-31 and R2-11-32 returning a HTTP configuration response with the RCS DISABLED STATE configuration parameter set to '–2' ensuring that the RCS touch points remain available as described in section 2.3.3.2 of [RCS6.0] or by setting the "version" parameter of the configuration response to -2 as described in section 2.2.3.2.1.2.

R2-11-24 For requirement R2-5-7, [RCC.15] does not impose restrictions on the use of the End User Confirmation request mechanism. Further messages can thus be sent at any point in time, including immediately after a message has been sent.

R2-11-25 As described in section 2.2.5 of [RCC.14] an Operator can choose to fall back to the SMS-based authentication mechanism used on networks where automatic identification is not possible. This allows in combination with the mechanism described in section 2.3.2 and 2.3.5 of [RCC.14] to handle that SMS in a manner that is not transparent to the user thereby supporting the requirement R2-6-1. This same non-transparent handling of the SMS can be used to realise this requirement on networks where automatic identification is not possible.

R2-11-26 Requirement R2-7-1 shall be implemented locally on the device by making the contents of any received User Message and non-volatile End User Confirmation Request available for consultation by the user at a later time. This consultation shall not require the user to provide a response to the request.

R2-11-27 Requirement R2-8-1 shall be implemented locally on the device and the information shall be OEM/client specific.

R2-11-28 Requirements R2-9-1 and R2-9-2 shall be implemented locally on the device.

R2-11-29 If the subscriber cannot be provisioned due to Operator policy (i.e. a permanent unavailability as described in requirement R2-9-4), the Service Provider can include a message as described in section 2.2.3 of [RCC.14] in a response disabling the RCS client (i.e. RCS DISABLED STATE or version parameter set to -1).

R2-11-30 As described in section 2.2.4 of [RCC.14], a number of consecutive internal errors (each resulting in a temporary unavailability as described in requirement R2-9-3) shall lead to a permanent unavailability. As described in section 2.3.4 of [RCC.14], for non-cellular networks, this situation shall be applicable only to that particular network however.

R2-11-31 A SMS shall be sent to the device with a specific format defined in section 3 of [RCC.14]. The push request for initial configuration of a device on which RCS was permanently disabled (i.e. as a consequence of R2-11-29 and R2-11-30 required in R2-10-1 and R2-10-3), and a reconfiguration of an active RCS device (required in R2-10-1 and R2-10-2), shall be enough to trigger a new configuration of a primary device.

R2-11-32 For the reconfiguration of primary and additional devices on which RCS is already active (required in R2-10-1 and R2-10-2), it shall be possible to trigger a reconfiguration by sending an End User Confirmation Request to the device as specified in section 2.1.3.1 of [RCC.15].

2.3 Capability Discovery and Service Availability

2.3.1 Description

The capability discovery is a process which enables RCS users to understand the set or subset of RCS services their contacts use, at certain points in time. Capability discovery can also be used by RCS entities to detect service awareness of other RCS users on behalf of an RCS service or user.

The availability of a RCS service is influenced by three categories of conditions:

1. Provisioning status
2. Device capability and status
3. Network conditions

2.3.2 User Stories and Feature Requirements

US3-1 **As a user, I want to be aware of the ways I can communicate with contacts stored in my contact list, regardless of their Service Provider or country where they reside.**

R3-1-1 The device shall make the detected RCS capabilities visible to the user for contacts following a contact list scan or an individual contact capability check.

R3-1-2 For a non RCS contact, the device shall only make services visible that are known to be compatible with defined RCS services.

R3-1-3 For Integrated Messaging, there shall not be any RCS service entry points when the recipient is known to be a non RCS user.

R3-1-4 The device shall make visible (based on the Operator configuration using the branded/unbranded parameter) whether a contact is RCS-enabled at least in the following touch points:

- Contact list
- Contact card
- Call log detailed view
- Activity log

NOTE: Appearance and visibility of RCS enabled contacts in these service entry points shall be left to OEM implementation. “joyn” iconography is no longer required.

US3-2 **As a user, I do not want to be disappointed by selecting a communication option that appears to be available but is not.**

R3-2-1 RCS service entry points which represent an available service at a given point in time shall be selectable by the user.

R3-2-2 Selecting an available RCS service shall initiate the device dialogue for that service.

US3-3 **As a user, I want to be sure that the information I have about my contacts RCS service capabilities is up to date and if they are available to communicate using those capabilities.**

R3-3-1 Based on a capability discovery or service availability poll performed by the device, the user shall be able to see which contacts are available for certain RCS services.

R3-3-2 Any capability discovery or service availability check of contacts shall happen in the background without any user notice.

R3-3-3 Operators can configure how service entry points shall be presented at key touch points on the device where RCS communications can occur, specifically:

R3-3-3-1 Service entry points for voice call shall always be visible and selectable at any given point in time.

R3-3-3-2 Service entry points for messaging shall always be visible and selectable at any given point in time. This requirement shall be applicable for Group Chat as well.

R3-3-3-3 Service entry points for File Transfer shall always be visible and selectable at any given point in time. This requirement shall be applicable for all services that use File Transfer as an enabler: Audio Messaging, vCard sharing and Geolocation Push.

R3-3-3-4 The IP Video Call service entry point shall be visible and selectable by the user if there is a high likelihood that the IP Video Call attempt will be successful at that time. If an IP Video Call is unlikely to be successful,

the IP Video Call service entry point shall be greyed out and not selectable. This variant applies for any phone number including RCS and non RCS contacts.

R3-3-3-5 The In-Call-Service service entry point(s) shall be visible and selectable by the user if there is a high likelihood the respective In-Call-Service attempt will be successful at that time. If this attempt is unlikely to be successful, the service entry point for In-Call-Services shall be greyed out and not selectable.

NOTE 1: In the case where the B-Party is a non RCS user with support for IR.94/IR.51 Conversational Video (as "video" capability identified during call setup) a high likelihood for a successful video call upgrade can be assumed.

R3-3-3-6 Detected Enriched Calling capabilities of contacts shall be presented as available features from defined service entry points for Enriched Calling on the device, covering Pre-call services, In-call services and Post-call services.

R3-3-3-7 The Pre-call Service entry point (i.e. Call Composer) shall always be visible and selectable for already known Enriched Calling users even without refreshing capabilities. With the exception there is a high likelihood that the user is offline (i.e. previous still valid capability check confirms the user is offline). When accessing the Call Composer, capability check shall be done, and until the capabilities are confirmed, pre-call services (i.e. important flag, location) shall be greyed out and not selectable. Entry point to start call shall be always active even while capabilities are confirmed.

R3-3-3-8 For Pre-call services, if a contact is known not to be Enriched Calling enabled, Pre-call features for that contact shall not be presented in any case to the A-Party.

R3-3-3-9 For In-call services and Post-call services, legacy or offline support shall be provided as defined in Legacy and offline support for In-call Sharing, see 2.12.4.7 and Legacy and offline support for Post-call Services, see 2.12.8.1

NOTE: There is no requirement to support any legacy or offline support for Pre-call services

NOTE 2: "Likely to succeed" means capability or service availability exchange is indicating end-to-end support. "Likely to fail" means capability or service availability exchange is indicating "not available at this time".

R3-3-4 A contact is deemed to be a RCS user when at least one RCS service capability is discovered and/or available for that contact.

R3-3-5 On first RCS device boot up, after installation and/or set up of the RCS application, and after each re-configuration of the RCS service, the device shall perform an initial setup scan of the contact list and find out which of the contacts are enabled for RCS services.

R3-3-6 Under certain circumstances after the initial setup scan, the device shall scan for RCS service capabilities of all contacts or defined subset(s) of contacts in the contact list in order to promote real time awareness and use of services. Any subsequent capability discovery and/or service availability checks shall only be made by the device based on the following:

R3-3-6-1 The device shall request an RCS capability discovery and/or service availability check/update of an individual contact when capability information is invalid or expired AND one of the following applies:

R3-3-6-1-1 When a new contact is added to the address book.

NOTE: If this contact is RCS enabled, their current capability is displayed.

R3-3-6-1-2 When opening the contact from the contact list.

R3-3-6-1-3 When starting a new conversation with the contact (e.g. when adding the contact to the “To:” field of a new message).

R3-3-6-1-4 When opening or returning to a conversation or thread with the contact (including unlocking the screen for an open conversation).

R3-3-6-1-5 When entering a potentially valid number into the dialler.

R3-3-6-1-6 When displaying any entry points to pre-call features (i.e. entering call composer, entering contact log).

R3-3-6-2 The Operator shall have the ability to limit the impact of capability and availability checks based on the following:

R3-3-6-2-1 An Operator defined minimum interval duration shall exist between two queries sent to the same RCS contact (CAPABILITY VALIDITY).

R3-3-6-2-2 An operator defined minimum interval duration shall exist between two queries sent to the same non-RCS contact.

R3-3-6-2-3 An operator defined telephone number prefix setting.

R3-3-6-2-4 RCS applications shall use known and valid contact capability or service availability information which is stored locally on the device (i.e. cached) when attempting to establish a connection with a contact.

R3-3-6-2-5 For In-Call services, a capability check shall always be made when the call has been set up and irrespective of whether the interval of capability checks has expired or not.

R3-3-6-3 Each response to a capability/service availability request/update shall include the current or most recently available capability/availability information.

R3-3-6-4 A sender of a capability / service availability request shall include the sender’s own latest capability and availability information in that request.

R3-3-7 The Operator shall be able to limit the impact of capability and availability checks (network load, device battery drain). This can be achieved by implementing a capability and availability network element which caches online and / or offline capabilities and availability of RCS users and answers capability and availability checks.

R3-3-7-1 The Operator may respond to capability requests with current user capabilities or service availabilities which are stored on the capability or service availability server.

R3-3-8 The RCS capability of a contact shall be removed when in the process of capability discovery and service availability exchange the network returns an error that indicates the user is not a provisioned RCS user.

R3-3-9 When a client is permanently removed from a device or otherwise permanently deactivated, it shall attempt to inform the Service Provider.

R3-3-10 A “triggered removal” shall be applied, when all of the following conditions apply:

R3-3-10-1 A RCS contact is manipulated by the user in such a way to trigger a capability and availability check (e.g. in a group chat picker), and its RCS capabilities are older than an Operator set parameter and the Operator does not request a periodic polling of the capabilities of contacts with obsolete capability information.

R3-3-10-2 The response to the capability exchange is inconclusive.

R3-3-11 When the RCS application on the device is disabled by the Operator, the contacts RCS capability and availability indications associated with the RCS application shall be removed from all associated device UI(s) on the user’s device.

R3-3-12 When the RCS application on the device is uninstalled by the user, the contacts RCS capability and availability indications associated with the RCS application shall be removed from all associated device UI(s) on the user’s device.

2.3.3 Technical Information

2.3.3.1 Overview

For the RCS Pre Universal Profile, the Capability Discovery and Service Availability shall be realised based the SIP Options Exchange as specified in sections 2.6.1.1, 2.6.2.1, 2.7, 2.7.1.1 of [RCC.07].

In addition,

- New capabilities are defined:
  - the Enriched Calling ICSI tags associated to each of the Enriched Calling services defined in [RCS6.0] apply as well as the new capability triggers defined in section 2.2 of [RCC.20].
  - the new File Transfer over SMS and Geolocation push over SMS capabilities defined in section 2.7 apply.
  - Message revoke defined in section 2.5.
  - Network interworking defined in section 2.5.
- Support for an operator ability to limit the impact of capability and availability checks based on prefix as defined in section 2.6.4.1 of [RCS6.0] using the configuration parameters CAPABILITY DISCOVERY ALLOWED PREFIXES and NON RCS CAPABILITY INFO EXPIRY defined in [RCS6.0].
- A new way to get information associated to a contact is derived from the 1-to-1 Chat signalling (in SIP INVITE and responses)

- A client receiving a network indication for the network support of a fallback mechanism as defined in section 2.5 shall cache this indication for the contact it relates to for future use. The client shall consider the stored network indication for as long as it considers the contact to be RCS capable. These cached values shall affect the capability exchange triggers (see below) and behaviour of the client when the network cannot indicate its capabilities (e.g. if a 486 response is returned).

- Given the values for the configuration parameters used in this profile not all Capability Exchange triggers defined in section 3.4.3.2 of [RCC.60] are relevant in all scenarios. Instead only for the following messaging specific cases, a capability check shall be triggered:

  - When checking the available RCS services/capabilities to communicate with another user:

    - Message composer is opened (contact already selected e.g. opening an existing thread, returning to the chat screen) provided that:

      - the Contact is not RCS capable or
      - the Contact is RCS capable, but the technology is latched to SMS (see section 2.5) or
      - the Contact is RCS capable and based on 1-to-1 Chat sessions established earlier, the contact is not on a network supporting either message revocation or interworking.

    - After selection of a new recipient for a 1-to-1 message (within the composer) provided that:

      - the Contact is not RCS capable or
      - the Contact is RCS capable, but the technology is latched to SMS (see section 2.5) or
      - the Contact is RCS capable and based on 1-to-1 Chat sessions established earlier, the contact is not on a network supporting either message revocation or interworking.

  - When the user for whom IM CAP ALWAYS ON is not enabled starts or continues typing a message to a contact that is

    - RCS capable and
    - not on a network supporting either message revocation or interworking and
    - towards which no session is active.

  - After re-establishment of the connection to the IP Multimedia Subsystem (IMS) network (e.g. due to regain of IP connectivity) for an active conversation with an RCS capable contact (i.e. conversation window is open) that is latched to SMS (see section 2.5).
  - When an xMS is received from a contact with which a Chat session is active in which the network didn't indicate support for message revocation or interworking and IM CAP ALWAYS ON is disabled.

- When in a session where the network didn't indicate support for message revocation or interworking a RCS message has not been delivered before a timeout (DELIVERY TIMEOUT, see [RCC.60]) and IM CAP ALWAYS ON (see [RCC.07]) is not enabled

For these triggers and to know whether the network serving the target contact supports message revocation or interworking, the client shall base on the capabilities cached from the last session or capability exchange. If no cached capabilities are available, the client shall assume that the terminating network does not support message revocation or network interworking.

A client complying to the profile defined in this document shall not consider other messaging related events to be a communication event for the purposes of that which is described in section 2.6.3.1 of [RCC.07].

2.3.3.2 Technical Implementation of User Stories and Service Requirements

R3-4-1 Requirements R3-1-1 to R3-1-4 shall be implemented locally on the device based on the result of the SIP OPTIONS exchanges (see Table 20 of [RCC.07]).

R3-4-2 Requirements R3-2-1 to R3-2-2 shall be implemented locally on the device.

R3-4-3 Requirement R3-3-1 shall be implemented locally on the device based on the result of the SIP OPTIONS exchanges. Requirement R3-3-2 shall be implemented locally on the device.

R3-4-4 Requirement R3-3-3 and its sub-requirements shall be implemented locally on the device.

R3-4-5 Requirements under R3-3-3-6 are implemented locally on the device and is supported when any RCS service tag is exposed/discovered.

R3-4-6 Requirements under R3-3-5 shall follow section 2.6.2 and 2.6.2.1 of [RCC.07].

R3-4-7 Requirement R3-3-6-1 and its sub-requirements shall be implemented locally on the device taking into account section 2.3.3.1.

R3-4-8 Requirements under R3-3-6-2 shall follow the capability discovery optimizations defined in 2.6.3, 2.6.4, and A.1.10 of [RCC.07] taking into account parameters CAPABILITY INFO EXPIRY of [RCC.07] and NON RCS CAPABILITY INFO EXPIRY of [RCS6.0].

R3-4-9 Requirement R3-3-6-2-3 shall follow 2.6.4.1 of [RCS6.0].

R3-4-10 Requirement R3-3-6-3 shall be realised using the response of each SIP OPTIONS as described in section 2.6.1.1.2 of [RCC.07].

R3-4-11 Requirement R3-3-6-4 shall be realised using SIP OPTIONS following section 2.6.1.1.2 of [RCC.07].

R3-4-12 Requirement R3-3-7-1 may be realised in the Network using a SIP OPTIONS AS.

R3-4-13 Requirement R3-3-8 is implemented locally on the device following error codes handling defined in 2.6.1.1 and 2.6.2.1 of [RCC.07].

R3-4-14 Requirement R3-3-9 shall set the version set to -1 in the configuration request and follow client codes 2.3.3.2.1 and procedures defined in [RCC.07].

R3-4-15 Requirement R3-3-10 is implemented locally on the device following 2.6.3 of [RCC.07] and POLLING PERIOD set to 0 as per A.1.10 of [RCC.07] or following 2.6.2.1 of [RCC.07] for inconclusive results.

R3-4-16 Requirement R3-3-11 shall be implemented locally on the device.

R3-4-17 Requirement R3-3-12 shall be implemented locally on the device.

2.3.3.3 Backward Compatibility

2.3.3.3.1 Pre-Universal Client to legacy Network

When connecting to a joyn Blackbird network the Pre-Universal Client will not receive the CAPABILITY DISCOVERY ALLOWED PREFIXES and NON RCS CAPABILITY INFO EXPIRY configuration parameters. As a consequence the default value of those parameters will apply.

2.4 Operator Messaging

2.4.1 Description

Operator Messaging describes a set of options that operators can chose from to determine the proposed messaging and file transfer service. Clients supporting the Pre-Universal profile shall support Operator Messaging requirements only for a transition period until all originating and interconnected terminating networks support the Pre-Universal profile with either Network Fallback to SMS (NFS) or Client Fallback to SMS incl. Revocation (CFS).

Once all networks have been upgraded to the Pre-Universal profile (or later), this section 2.4 is considered void. Pre-Universal profile clients shall support the following 3 modes:

- RCS legacy Mode: the proposed messaging service shall be determined by Operator Messaging logic, as described in this section 2.4 and as -configured by the operator, whenever there is no information available that the terminating leg (On-Net or Off-Net) supports Delivery Assurance.
- Delivery Assurance by Network Fallback to SMS Mode.
- Delivery Assurance by Client Fallback to SMS incl. Revocation Mode.

Please note: If a reference in this document points to this section 2.4 to reference the logic to determine the proposed Operator Messaging Service, the requirements for the Delivery Assurance Modes (for both, NFS and CFS) are provided in 1-to-1 Chat (section 2.5) and File Transfer (section 2.7).

Messaging integrates various Messaging Services (SMS, MMS, 1-to-1 Chat, Group Chat, File Transfer, Geolocation Push, and Audio Messaging) to one single conversational view for the end consumer. This chapter is structured into two main parts: the representation of Operator Messaging on the device, and the client logic that proposes / decides the Messaging Service, based on availability of services and bearers on both sides of the conversation to convey the message or file. The proposed Messaging Service can be overridden at any time by the end consumer.

A device can be configured with one of the following options to determine the client logic used to propose the appropriate Messaging service at any given time:

EITHER
- Online experience for messaging,OR
- Offline experience for messaging,

AND EITHER
- Online experience for sending files, OR
- Offline experience for sending files

AND optionally File Transfer experience for sending files to non-RCS users

During the Device Provisioning Process, the Operator sets parameters to configure the service in the way they want to offer the service.

2.4.2 User Stories and Feature Requirements

US4-1 **As an operator, I want to offer the procedures of NFS and CFS whenever technically possible in a given combination of clients and networks supporting Blackbird, CPR and Pre-Universal profile.**

R4-1-1 The A-Party device shall ignore the requirements of Operator Messaging (this entire section 2.4) for a conversation whenever the networks support Delivery Assurance (either Client Fallback to SMS incl. Revocation (CFS) or Network Fallback to SMS (NFS)).

R4-1-2 The A-Party device shall apply the requirements of Operator Messaging to determine the suggested service for messaging and file transfer for a conversation with a contact, if the terminating network does not allow to use Delivery Assurance (Network Fallback to SMS (NFS) or Client Fallback to SMS incl. Revocation (CFS)).

US4-2 **As a user, I want to see all messages and files exchanged with a contact in a single threaded view.**
As a user, I want a single environment for creating and viewing my messages, covering a multitude of different services. By having this convenience, I don't have to change apps to carry out similar messaging tasks.

R4-2-1 In Operator Messaging, the user shall see any Messages and File Transfer events exchanged with a single contact grouped into one Conversation thread.

R4-2-2 All Messages and File Transfer events shall appear in order of the time that they have been sent and received on the device. Details for message order are defined in '1-to-1 Chat', see Section 2.5 (1-to-1 Chatand 'File Transfer incl. Geolocation Push', see Section 2.7 (File Transfer incl. Geolocation Push).

R4-2-3 The Operator Messaging application shall combine the composing of RCS Messaging and File Transfer with xMS messaging.

R4-2-4 Operator Messaging shall have no impact on the RCS Group Chat experience of the user.

NOTE: RCS Group Chat is the only Operator service today that delivers a full group chat experience, hence, there is no integration necessary).

R4-2-5 All messaging entry points on a device shall ensure access to full the Operator Messaging experience.

NOTE: For native implementations.

US4-3 **As a user, I want full visibility about the Messaging Service that is used for sending a message or a file.**

R4-3-1 Before sending a message, the sending button shall use appropriate means to indicate whether a message or file will be sent using xMS or RCS Chat / File Transfer.

R4-3-2 The user shall be able to change the preferred messaging service on a, per message / file basis and on a general basis.

NOTE: Except the messages in outbox

R4-3-3 The user shall have full visibility of the service that is used during and after the creation of a new message / file transfer.

US4-4 **As a user, I want to know the status of any messages or files I have sent**

R4-4-1 States for sent RCS messages and files as described in '1-to-1 Chat', see Section 2.5, Section 2.6 Group Chat and Section 2.7 File Transfer incl. Geolocation Push shall be supported in Operator Messaging.

R4-4-2 For legacy xMS messages sent from a device, Delivery Notifications may be supported upon user choice or network default configuration.

R4-4-3 For legacy xMS messages sent from a device, Display Notifications will not be available.

R4-4-4 For legacy xMS messages sent from a device, the message status "pending" shall be provided (e.g. for messages queuing on the device).

R4-4-5 For legacy xMS messages sent from a device, the status "Message failed" shall be supported in case the message could not be sent. (Re-sending the message may be triggered manually by the user).

R4-4-6 Aggregation of Display notifications may be done: if it was confirmed the last message has been displayed, then all previously confirmed 'delivered' messages and files can be assumed displayed as well and the status may be aggregated in the last known 'displayed' status notification.

R4-4-7 The 'failed' status notification shall never be aggregated but presented separately to the user.

US4-5 **As a user, I want to ensure that my messages reach their destination as reliably and quickly as possible.**

R4-5-1 To avoid a cluttered experience between Operator Messaging users and non-Integrated / non-Seamless Messaging RCS users, the user equipment shall be aware of the Integrated / Seamless Messaging capability of any of the RCS enabled contacts in order to adjust behaviour accordingly.

R4-5-2 The Operator shall ensure all messages and related messaging services originating from a device shall be conveyed in a manner that will ensure the quickest delivery to the recipient.

NOTE: This may involve the network conveying the message or file on a different Messaging Service or File Transfer service.

R4-5-3 Store and Forward shall be available and provided by every RCS Service Provider to host messages and file transfer requests for its RCS users on the terminating leg when these users are offline.

R4-5-4 For xMS messages sent from the device, Store and Forward function shall be available and provided by the Operator network.

NOTE: Details outside of this RCS specification.

R4-5-5 For MMS files sent from the device, the user shall not be given the option of selecting files that are not compatible with the MMS technology.

R4-5-6 For files sent from the device using MMS, the restrictions of the MMS service on file type and size will apply.

R4-5-7 For MMS files sent from the device, the user shall be notified of file format changes based on the MMS service parameters.

R4-5-8 For 1-to-1 Chat messages, the full RCS chat experience applies, e.g. but not limited to, emoticons and Emoji (guaranteed correct display), and Delivery and Display Notifications shall be available).

NOTE: Details of "the full RCS chat experience" are described in 1-to-1 Chat, see Section 2.5.

R4-5-9 SMS messages shall support emoticons according to the RCS standard.

NOTE: It is an accepted compromise that some emoticons may not be correctly converted to graphics by legacy receiving devices.

R4-5-10 SMS messages shall support Emoji according to the RCS standard, if UNICODE messaging encoding is available (either via automatic or manual selection). Whenever UNICODE encoding is not available, it shall not be possible to send Emoji.

NOTE: It is an accepted compromise that some Emoji may not be correctly converted to graphics by legacy receiving devices.

US4-6 **As an Operator, I want to make sure that any application taking on default management of xMS messaging on a device of an RCS-enabled user shall also display and take on management of RCS messages and ensure that the Operator promise of Operator Messaging is guaranteed.**

R4-6-1 Any application allowed to manage (read, write, view) xMS on a device shall also be allowed to manage (read, write, view) RCS chat messages. Any application allowed to manage (read, write, view) RCS chat on a device shall also be allowed to manage (read, write, view) xMS messages.

R4-6-2 Any application selected by the user as the default messaging application shall manage xMS and RCS messages (incl. File Transfer) as defined by the Operator Messaging rules detailed in this PDD.

R4-6-3 Notifications for new incoming (RCS or xMS) messages shall be handled according to the specifications in 1-to-1 Chat, see Section 2.5 (1-to-1 Chat, Group Chat', see Section 2.6 (Group Chat), and 'File Transfer incl. Geolocation Push', see Section 2.7 (File Transfer incl. Geolocation Push) and shall not be replicated across multiple apps on a device.

NOTE: This shall be to avoid a situation where a 'read' message is still seen as 'unread' in another application.

R4-6-4 Any application managing xMS and RCS chat messages on a device shall follow the rules prescribed in this Operator Messaging section.

R4-6-5 The Operator Messaging conversations shall be visible from the native messaging icon and/or the icon of the application which has taken on message management.

R4-6-6 The Operator Messaging application must conform to the Messaging Service requirements when sending xMS messages from the device.

US4-7 **As a user, I want to use the various Operator Messaging services independently of the bearer that is available.**

R4-7-1 SMS (delivery and reception) shall be available whenever connected to cellular coverage or EPC integrated Wi-Fi.

R4-7-2 MMS (delivery and reception) shall be available whenever connected to cellular data, cellular (but no cellular data) plus Wi-Fi and EPC integrated Wi-Fi.

R4-7-3 RCS services (delivery and reception) shall be available whenever connected to cellular data, Wi-Fi or EPC integrated Wi-Fi (this requirement shall be valid for users who are already provisioned).

2.4.2.1 Operator customisation for representation of Operator Messaging on the device.

2.4.2.1.1 "Integrated Messaging" User Stories / Requirements

US4-8 **As a user, I want a service logic to propose the Messaging Service to be used.**

US4-9 **As a user, I want to be able to override the proposed Messaging Service during the message composing and file selection processes.**

US4-10 **As a user, I always want to know what type of message I am sending, before submitting it and I want this information to be clearly represented on my screen.**

US4-11 **As a user, I always want to know the type of message or file I have sent, and I want this information to be clearly represented on my screen.**

R4-11-1 When opening the conversation or entering the message composer on the device, the client logic shall propose the Messaging Service (either xMS based or RCS based) to be used for that message.

R4-11-2 The device UI shall indicate to the user before a message / file is sent what the currently selected Messaging or File Transfer Service is.

R4-11-3 The user shall have, the opportunity to change the Messaging or File Transfer Service override the proposed setting.

NOTE: This shall be a "one click experience" on UI level.

R4-11-4 The user should have, at any time during the Message Composing or File Selection process, the opportunity to change the Messaging or File Transfer Service and override the proposed setting.

NOTE: This shall be a "one click experience" on UI level.

R4-11-5 A warning may be shown to the user when the composer changes the sending Messaging Service whilst the user is typing a message, informing them that xMS or chat services are charged as per their tariff. If the warning is shown, the user shall have the possibility to dismiss such a notice permanently.

R4-11-6 A manual user selection of a Messaging or File Transfer Service during an active conversation shall be persistent until either manually changed again by the user or until the user navigates out of the conversation thread.

R4-11-7 The creation of a new conversation shall trigger the automatic selection of the proposed Messaging Service.

R4-11-8 Any time during the process of selecting and sending a message or a file, the client logic shall propose a Messaging or File Transfer Service (either xMS based or RCS based) to be used for that message.

R4-11-9 If the available technology changes while the user is in the process of composing a message or selecting a file, any impact of the technology change on the available message content must be made clear to the user, and they shall be able to reject or delay the automatic technology change if required.

R4-11-10 After sending a message or file, the device UI shall differentiate the Messaging or File Transfer Service that was used.

NOTE: Differentiation shall allow the user to know which Messaging (i.e. chat / SMS) or File Transfer (i.e. File Transfer, MMS) Service was used to convey the message. Further detail on this requirement is provided in the joyn branding guidelines.

R4-11-11 The RCS File Transfer service shall be clearly differentiated from MMS.

R4-11-11-1 All RCS terminology and visual indicators should be used consistently across all RCS messaging clients and interfaces.

R4-11-11-2 Where appropriate, text labels should be displayed to identify the different message statuses. Visual indicators may also employed to identify the different message statuses.

R4-11-11-3 The RCS File Transfer service should be clearly differentiated from MMS, for example, through the use of appropriate text labels and visual indicators.

R4-11-12 Where appropriate, the user should be made aware of any additional or enhanced File Transfer functionality available via RCS (vs. MMS), for example - but not limited to - the transfer of HD video.

R4-11-13 When receiving a message or file, the device UI shall differentiate the Messaging or File Transfer Service that was used.

NOTE: Differentiation shall allow the user to know which Messaging (i.e. chat / SMS) or File Transfer (i.e. RCS File Transfer/ MMS) Service was used to convey the message.

R4-11-13-1 The text labels ‘Chat', ‘SMS’ and ‘MMS’ should be used where appropriate to identify the different Messaging Services for both sent and received messages.

R4-11-13-2 Colour coding may also be used to differentiate message types, but should not be the only type of differentiation used.

R4-11-14 If the Operator has changed the Messaging or File Transfer Service on the terminating leg to ensure delivery, the A-Party UI shall not change the Messaging or File Transfer Service indication (e.g. A-Party creates an RCS Chat Message, the Operator terminates this message as xMS if the B-Party has cellular connectivity but is not registered to RCS).

NOTE: In this case, a message is indicated as RCS Chat on the sending device and may be shown as SMS on the receiving device.

R4-11-15 The device shall provide the user with an option to resend pending or failed RCS messages or files by another Messaging or File Transfer Service, e.g., but not limited to, cases where the A-Party loses connectivity due to changing radio conditions. If, in this case, the initial message was pending and has not yet been sent, the device shall not make further attempts to send the message using the attempted Messaging Service but shall propose the alternative Messaging Service to be used instead. If there are also further, more recent, undelivered RCS messages sent by the A-Party in that active conversation then the user is asked whether they would like to resend just the single message (for which the timer has expired) or all of the undelivered messages.

US4-12 **As a user, I want to be in control of the default messaging service in Operator Messaging.**

R4-12-1 A setting shall allow the user to select the default sending method to be used:

- 'Proposed Messaging Service' (follow Integrated Messaging behaviour as defined in Integrated Messaging requirements), or
- 'Always RCS chat for RCS enabled contacts and SMS for non-RCS enabled contacts or
- 'Always SMS' (for RCS enabled contacts and non-RCS enabled contacts).

R4-12-2 The default setting shall be "Proposed Messaging Service".

R4-12-3 It shall always be visible to the user which Messaging Service is used, and the user shall have the option to change the chosen Messaging Service irrespectively of the setting in R4-12-1 upon user interaction (as a case by case decision taken in the messaging composer).

2.4.2.2 Client Logic to propose the desired Messaging Service – Integrated Messaging 'Online experience') (IM_CAP_ALWAYS_ON = 0 / SMS as default)

US4-13 **As a user, I want the best Messaging Service to be proposed to me to convey my messages.**

R4-13-1 The preferred messaging service for composing and sending messages shall be determined by a number of factors, including but not limited to, the RCS Online/Offline status of the sender (A-Party) and the receiver (B-Party).

NOTE: See requirement R3-3-6-1 for Capability Validity and checking requirements. Neither user's cellular connectivity is relevant for determining the preferred messaging service.

2.4.2.2.1 Entering a new or existing conversation

The preferred messaging service is automatically determined according to rules described below:

R4-13-1-1 Preferred Messaging Service when entering a new or existing conversation (including, but not limited to, opening a conversation, returning to a conversation and unlocking the screen on an open conversation):

R4-13-1-1 If a valid capability check is available when opening the conversation, then the preferred service is set accordingly.

R4-13-1-2 If a new capability check is required, then xMS is the preferred service until the result of this new capability check is available. If the result of this new capability check is that the B-Party is RCS online, then the preferred service changes to Chat.

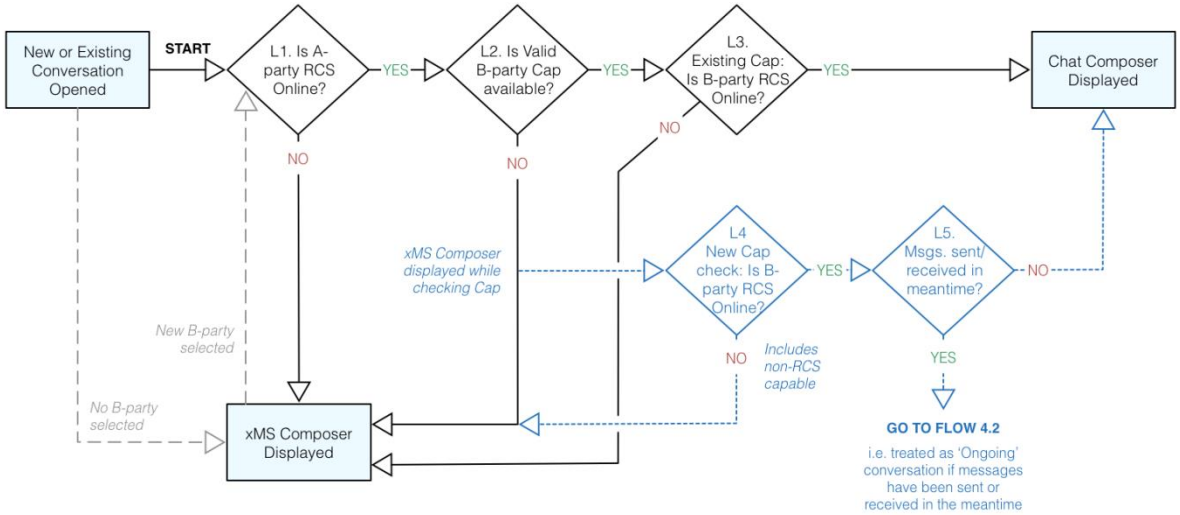

Figure 4: Initial Technology Selection Logic When Entering a Conversation [IM_CAP_ALWAYS_ON=0]

2.4.2.2.2 During an ongoing xMS conversation

R4-13-1-2 During an 'on-going' xMS conversation the proposed Messaging Service shall change according to Figure 5, including (but not limited to) the following cases:

R4-13-1-3 When a chat message or RCS File is received from the B-Party.

R4-13-1-4 When the B-Party, with Integrated (or Seamless) messaging, is discovered as RCS online.

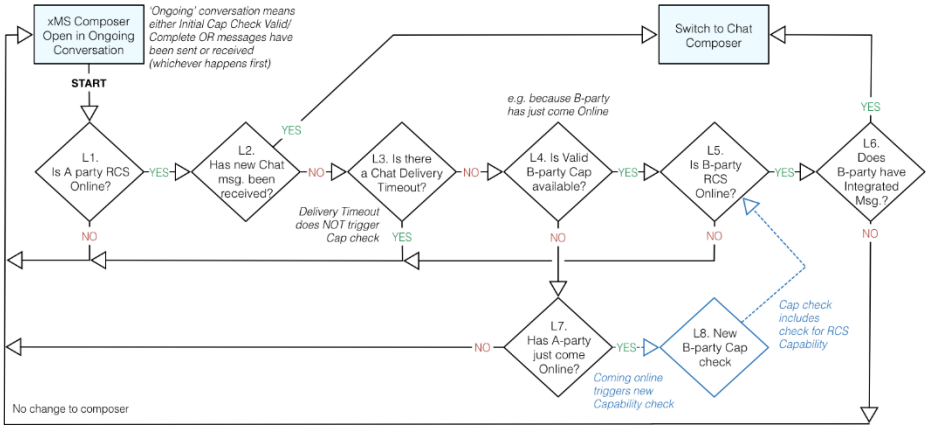

Figure 5: Technology Selection Logic During an ongoing Conversation (when current composer is xMS) [IM_CAP_ALWAYS_ON=0]

2.4.2.2.3 During an on-going RCS conversation:

R4-13-1-5 During an 'on-going' RCS conversation the proposed Messaging Service shall change according to Figure 6, including, but not limited to, the following cases:

R4-13-1-6 When an xMS message is received from the B-Party. This will cause the DELIVERY TIMEOUT timer to expire.

R4-13-1-7 When the B-Party is an Integrated (or Seamless) Messaging user and expiry of the Delivery Timeout timer occurs.

NOTE: There is no immediate change to the Messaging Service if the A-Party loses data connectivity. The device waits for the expiry of Delivery Timeout before changing to xMS.

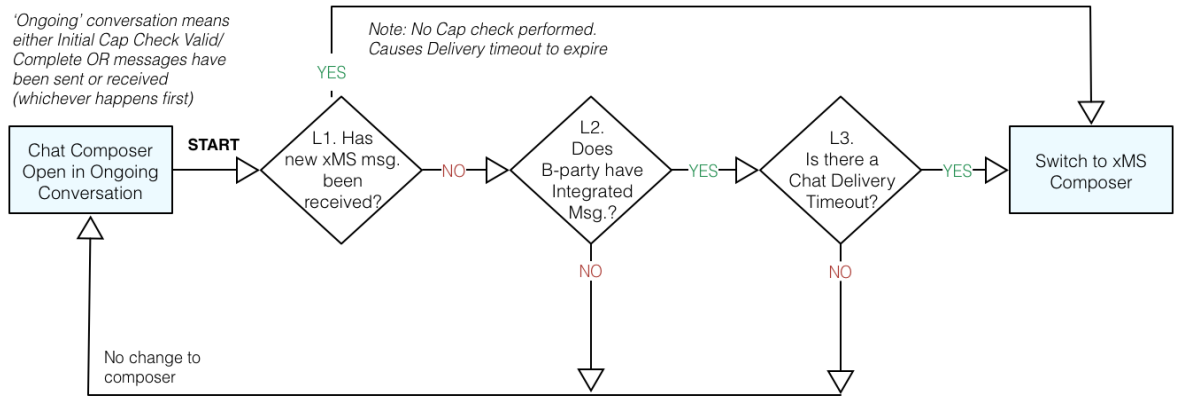

Figure 6: Technology Selection Logic During an Ongoing Conversation (when current composer is Chat) [IM_CAP_ALWAYS_ON=0]

2.4.2.3 "DELIVERY TIMEOUT":

The DELIVERY TIMEOUT timer defines the timeout for reception of delivery reports for RCS messages and files sent to the B-Party. There is one DELIVERY TIMEOUT timer used per conversation.

R4-13-1-8 This timer is armed/started during an RCS conversation, in any of the following situations:

- When sending an RCS chat message or file while there is no other message or file undelivered or unsent.
- When the A-Party loses IP connectivity, and there are undelivered or pending chat messages or files.

R4-13-1-9 The DELIVERY TIMEOUT will be stopped when receiving a message or file delivery notification, but immediately restarted ("rearmed") if there are still undelivered or pending RCS message(s).

R4-13-1-10 When the DELIVERY TIMEOUT expires, any undelivered messages shall have their status changed to "undelivered" and any pending messages shall have their status changed to "failed".

R4-13-1-11 DELIVERY TIMEOUT is only calculated for the first undelivered chat message or file transfer after a delivered one. Example:

R4-13-2 Undelivered chat messages (sent but not delivered)

R4-13-2-1 When A-Party is RCS online and a DELIVERY TIMEOUT expires, sent but not delivered chat messages, shall be considered as “undelivered”. The user shall be able to send manually by SMS any “undelivered” chat messages by xMS.

R4-13-2-2 The user shall be notified about undelivered chat messages:

- Inside the message thread: through an indication in the thread (message status indication). The first time this indication is shown, a contextual indication (e.g. tool tip) shall explain to the user what it means and what options the user has (e.g. resending via SMS).

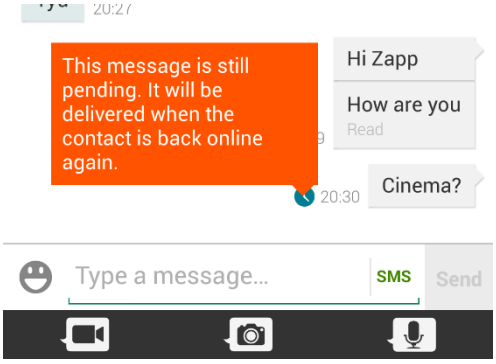

Figure 7: Example of a tool tip indication to notify the user of undelivered chat messages

R4-13-3 In the messaging inbox:

R4-13-3-1 The user shall be informed through a system notification that:

R4-13-3-1-1 Some messages have not been delivered yet.

R4-13-3-1-2 Those messages will be delivered when the receiver is back online.

R4-13-3-1-3 The user shall be able to resend one or all of the undelivered messages by SMS.

R4-13-3-2 Opening the notification shall forward the user to the associated message thread.

R4-13-3-3 The same indication should be displayed in both the inbox view and the associated message thread view.

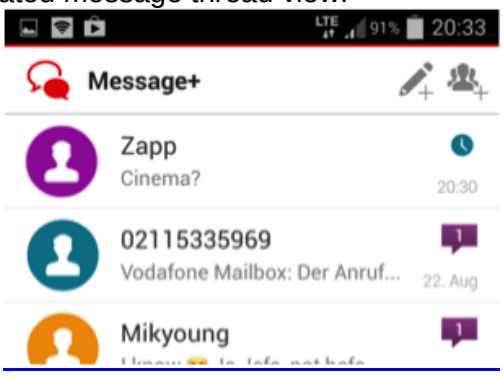

Figure 8: Example of indication in Inbox of a thread containing undelivered messages

R4-13-4 When outside the message thread or inbox the user shall be informed through a system notification that:

R4-13-4-1 Some messages have not yet been delivered:

R4-13-4-1-1 These messages will be delivered when the receiver is back online again.

R4-13-4-1-2 The user is able to resend these messages by xMS.

R4-13-4-2 Opening the notification shall forward the user to the associated message thread.

2.4.2.3.1 Unsent Chat Messages (pending)

R4-13-4-3 When the A-Party goes offline during an ongoing chat conversation, pending chat messages (i.e. those the user has attempted to send but have not yet become “sent”) shall be queued and marked as “pending”. The user shall be able to retry manually the sending of one or all of these messages by xMS.

R4-13-4-4 When a DELIVERY TIMEOUT expires for these pending chat messages, they shall be considered as “failed”. The user shall be able to retry manually the sending of one or all of these messages by xMS, or via chat if it becomes available again.

R4-13-4-5 The user shall be notified about “pending” chat messages:

- Inside the message thread: through an indication in the thread (message status indication).
- In the messaging inbox: the visual indication should be used in both the message inbox view and the message thread view.
- Outside the message thread or inbox: notification shall not be displayed to the user.

R4-13-4-6 The user shall be notified about “failed” chat messages:

- Inside the message thread: through indication in the thread (message status indication).
- In the messaging inbox: the same visual indication should be used in both the message inbox view and the message thread view.
- Outside the message thread or inbox: through a system notification. The notification shall inform the user that some messages are filed and will not be sent.
- Opening the notification shall forward the user to the associated message thread.

2.4.2.4 Integrated Messaging ‘Offline experience’– (IM_CAP_ALWAYS_ON = 1 / RCS Chat as default between RCS users)

US4-14 **As a user, I want the best Messaging Service to be proposed to me to convey my messages.**

R4-14-1 The messaging service to be proposed for sending messages to RCS capable users shall be determined by the connectivity status to the RCS platform of the sender (A-Party).

R4-14-1-1 RCS Chat shall be the default Messaging Service for outbound messages proposed by the device for recipients (B-Party) being known as RCS capable contacts, irrespective of their connectivity status.

R4-14-2 If the A-Party has lost IP connectivity to the RCS service, messages to B-Party being an RCS user shall be 1-to-1 Chat locally queued and sent once the IP connectivity is restored. In this case, the A-Party shall be informed about the loss of the connectivity status by the device appropriately.

R4-14-2-1 If the A-Party is not registered to the RCS service (e.g. the user has chosen to switch their mobile data setting to "OFF"), the proposed Messaging Service shall be SMS.

R4-14-3 SMS shall be the default messaging service for outbound messages proposed by the device logic for recipients (B-Party) being known or detected as not RCS capable. In case the device has no cellular connectivity, SMS messages shall be queued locally on the device and be sent once the connection to cellular is restored.

NOTE: In case cellular is not available, the SMS shall be locally queued on the device.

Integrated Messaging 'Offline experience' (IM CAP ALWAYS ON=1)- Selected Messaging Service					
User A (Sender)	Connected to Cellular Network	Yes	Yes	N/A	Yes
	Connected to RCS	No	No	Yes	Yes
User B (Receiver)	Connected to Cellular Network Connected to RCS	N/A			
Selected Service	**Default**	RCS*	SMS	RCS	SMS**
	User Choice	SMS	RCS*	SMS***	N/A
*On-device caching of messages is required and user shall be informed ** If B-Party is known to be a non RCS user ***If cellular network connection is not available, on-device caching of messages is required and user shall be informed					

Table 5: Table to explain and summarise static conditions and proposed Messaging Service by the device logic

2.4.2.5 Integrated Messaging – File Transfer 1 (FT_HTTP_CAP_ALWAYS_ON=0 / Online experience only)

US4-15 **As a user, I want the best File Transfer Service to be proposed to me to convey my files.**

R4-15-1 The File Transfer Service to be proposed for sending files shall be determined by the registration status to RCS platform of the sender (A-Party) and receiver (B-Party). When to refresh capabilities is described in section R3-3-6-1.The proposed File Transfer Service shall be adjusted

according to the rules defined in R4-13-1 as the behaviour expected for File Transfer 1 is the same than the behaviour described in Integrated Messaging 1 section.

R4-15-2 If the A-Party is not registered to RCS ('offline'), MMS shall be considered the default File Transfer Service proposed by the device logic.

NOTE: In this case, RCS File Transfer shall not be sent.

R4-15-2-1 If MMS messages cannot be sent immediately, MMS shall be composed and queued locally on the device until data connection is restored.

R4-15-3 If the A-Party is registered to RCS ("online") and in cellular coverage, the current capabilities of B-Party determine the proposed messaging service. The proposed File Transfer Service shall be adjusted according to the rules defined in R4-13-1.

R4-15-4 If A-Party is registered to RCS ("online") but outside of cellular coverage, the current capabilities of the B-Party shall determine the proposed File Transfer Service.

R4-15-4-1 If the B-Party is registered to RCS ("online"), then RCS File Transfer service shall be proposed.

R4-15-4-2 If B-Party is not registered to RCS ("offline") or if the A-Party has not yet determined B-Party's capabilities, the proposed File Transfer Service shall be MMS and messages are queued locally on the device and delivered as soon as cellular connectivity is restored.

NOTE: This shall be the case even if B-Party is a known RCS user.

File Transfer 'Online experience' (FT_HTTP_CAP_ALWAS_ON=0) - Selected File Transfer Service				
User A	Connect to Cellular network	n/a	n/a	n/a
Sender	Connect to RCS	No	Yes	Yes
User B	Connect to Cellular network	n/a	n/a	n/a
Receiver (RCS user)	Connect to RCS	n/a	Yes	No
	Default FT service	**MMS***	**RCS FT**	**MMS***
Proposed Service	**User Choice**	**RCS FT**	**MMS**	**RCS FT**
	*On-device caching of unsent files required and user shall be informed			

Table 6: Table to explain and summarise static conditions and proposed Messaging Service by the device logic.

2.4.2.6 Integrated Messaging – File Transfer 2 (FT_HTTP_CAP_ALWAYS_ON=1 / Offline experience)

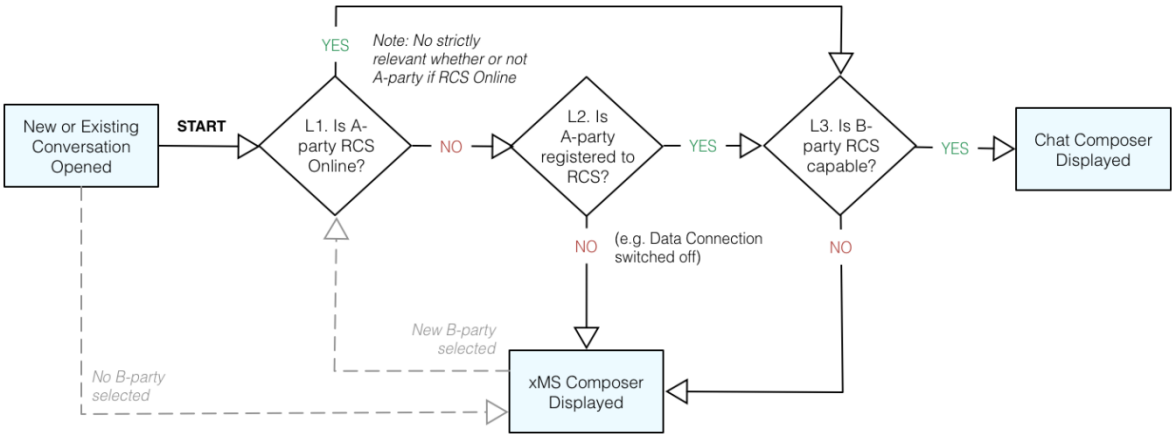

Figure 9: FT HTTP CAP ALWAYS ON=1 Flow diagram

US4-16 **As a user, I want the best File Transfer Service to be proposed to me to convey my files.**

R4-16-1 The proposed File Transfer Service to be used for sending files shall be determined by the registration status to RCS platform of the sender (A-Party) and if the B-Party is a known RCS user .

R4-16-2 If the A-Party is registered to RCS (“online”),

R4-16-2-1 RCS File Transfer shall be the default service for outbound files proposed by the device logic for recipients that are known RCS capable contacts, irrespective of their connectivity status.

R4-16-2-2 MMS shall be the default File Transfer Service for outbound messages proposed by the device logic for recipients that are known or detected to be not RCS capable.

R4-16-2-3 If an Operator has disabled the MMS service, the RCS File Transfer service shall be used to deliver files to non RCS users irrespective of the connection status of the sender.

R4-16-3 If the A-Party is not registered to RCS (“offline”),

R4-16-3-1 Any files sent to a B-Party who is known as an RCS user shall be RCS File Transfer queued locally on the device and sent once the RCS connectivity is restored. In this case, the A-Party shall be informed about the “offline” status by the device appropriately.

R4-16-3-2 Any Files sent to a B-Party who is not known as an RCS user shall be sent as MMS. If no data connection is available, MMS shall be queued locally on the device, the A-Party shall be informed about the “offline” status by the device appropriately and the file will be sent once mobile data is available.

File Transfer 'Offline experience' (FT_HTTP_CAP_ALWAS_ON=1) - Selected File Transfer Service				
User A	Connect to Cellular network	n/a	n/a	n/a
Sender	Connect to RCS	Yes	No	n/a
User B	Connect to Cellular network	n/a	n/a	n/a
Receiver (RCS user)	Connect to RCS	n/a	n/a	n/a
	Default FT service	**RCS FT**	**RCS FT***	**MMS****
Proposed Service	**User Choice**	**MMS**	**MMS***	n/a
	*On-device caching of unsent files required and user shall be informed ** If B-Party is known to be a non RCS user			

Table 7: Table to explain and summarise static conditions and proposed Messaging Service by the device logic

2.4.2.7 Client Logic to propose desired Messaging and File Transfer Service- Integrated Messaging – File Transfer 3 (File Transfer with Store and Forward and no MMS as back-up)

US4-17 **As a user, I want the File Transfer Service to be proposed to me to convey my files.**

R4-17-1 If the A-Party is online, RCS File Transfer shall be the service for outbound files for all recipients, irrespective of their RCS capability.

R4-17-2 If the A-Party is offline, any files sent to any B-Party shall be RCS File Transfer locally queued and sent once the RCS connectivity is restored. In this case, the A-Party shall be informed about the "offline" status by the device appropriately.

R4-17-3 If B-Party is known to be a non RCS user, A-Party shall be informed about the file being stored in the network, and a SMS (which includes a link for file retrieval) being sent to B-Party.

File Transfer 3 (FT HTTP Fallback) - Selected File Transfer Service				
User A - Sender	Connected to Cellular network	n/a		
	Registered to RCS	Yes	Yes	No
User B - Receiver	Connected to Cellular network	n/a		
	Registered to RCS	Yes	No	n/a
Selected service		**RCS FT**	**RCS FT****	**RCS FT***
* On-device caching of unsent RCS files required, and the user shall be informed. ** If B-Party is known to be a non RCS user (legacy user), network shall store the file and a SMS with a link to retrieve the file sent from User's A device to User B. User A shall be informed. If the B-Party is not online, File Transfer Store and Forward shall apply.				

2.4.2.8 Multimedia Message Service Selection

The sections above (sections 2.4.2.2 to 2.4.2.6) describe the logic for selecting the preferred messaging service for individual messages and File Transfers in a conversation. As

described, the preferred messaging service is influenced by the IM_CAP_ALWAYS_ON and FT_HTTP_CAP_ALWAYS_ON configuration parameters.

A client configuration where these two parameters are set to different values (e.g. where IM_CAP is set to “0", and FT_HTTP_CAP is set to “1") can result in two different messaging services being selected for different messages in the same conversation. For example, SMS being selected for text messages and RCS File transfer for files. (This would be the case with a client configuration of IM_CAP_ALWAYS_ON=0 and FT_HTTP_CAP_ALWAYS_ON=1, in a conversation where the A-Party is online and the B-Party is offline).

Some devices, however, allow users to enter both text and files while composing a single message.

R4-17-4 When a single message includes both text and file components, the entire ‘multimedia’ message must be conveyed using the same messaging service to preserve the consistency of the message:

R4-17-4-1 The MMS service must be used if xMS has been selected by the client logic for either the text and/or the file components of the multimedia message and FT HTTP Fallback is not enabled.

R4-17-4-2 If FT HTTP Fallback is enabled, the compound message shall be sent over RCS File Transfer, and the behaviour described in section 2.4.2.7 shall be followed.
Note: These requirements apply only to BB/CPR RCS users.

R4-17-4-3 RCS chat and RCS File Transfer must be used only when RCS has been selected by the client logic for both the text and the file components of the multimedia message.

2.4.3 Technical Information

2.4.3.1 Overview

Operator Messaging is a client functionality to provide the user with a common messaging service behaviour using multiple services and technologies. This section covers functional requirements for the client to select and apply the specified service behaviour for a number of messaging service. Whilst the Operator Messaging Service User Stories and Feature Requirements deal with the co-existence of the services in the client, the technical implementation of the referred individual services shall be based on the following:

- The RCS 1-to-1 Chat service refers to the service defined in see Section 2.5
- The RCS File Transfer Service refers to the service defined in ‘File Transfer incl. Geolocation Push’, see Section 2.7
- The Short Messaging Service (SMS) is as defined in [3GPP TS 23.040] or the Short Messaging Service over IP as defined in [PRD-IR.92] based upon it.
- If provided, The Multimedia Messaging Service (MMS) is provided by the client as defined in 3GPP TS 23.140.

2.4.3.2 Capability Discovery

To realise the behaviour specified in this section, a client shall indicate whether an Integrated Messaging Ux is provided to the user. This is achieved by the use of the SIP OPTIONS tag for Integrated Messaging as defined in section 4.3.2 of [RCC.60].

2.4.3.3 Technical Implementation of User Stories and Service Requirements

R4-18-1 The procedures for Delivery Assurance are defined section 2.5. A client shall ignore the requirements of Operator Messaging (this entire section 2.4) for a conversation if the network supports Delivery Assurance (either Client Fallback to SMS incl. Revocation (CFS) or Network Fallback to SMS (NFS)). The client procedures to determine the support of Delivery Assurance are defined in section 2.5.

R4-18-2 The requirements listed under user story US4-2 and US4-3 shall be implemented locally on the client.

R4-18-3 The requirements listed under user story US4-4 shall be implemented locally on the client based on the submission, delivery and display status technology of the various messaging technologies.

R4-18-4 Requirement R4-5-1 shall be implemented as defined in section 2.4.3.2 of this document.

R4-18-5 The implementation of requirement R4-5-2 is left to the discretion of the service provider.

R4-18-6 For the implementation of requirements R4-5-3 and R4-5-4 refer to the definitions of the services defined in section 2.4.3.1.

R4-18-7 For a definition of file types applicable for MMS as per requirements R4-5-5 and R4-5-6 refer to the definitions of formats and codecs for MMS in [OMA-MMS-CONF].

R4-18-8 The requirement R4-5-7 shall be implemented locally on the device.

R4-18-9 For the definition of the full RCS chat experience in requirement R4-5-8 refer to section 2.5 of this document.

R4-18-10 The requirement R4-5-9 shall be implemented locally on the client. For a definition of RCS emoticon refer to Annex A.2.

R4-18-11 The requirement R4-5-10 shall be implemented locally on the client. For a definition of RCS Emoji refer to Annex A.3. If an Emoji is present in a short message, the user part is to be encoded using UCS2.

R4-18-12 The requirements listed under user story US4-6 shall be implemented locally on the client.

R4-18-13 The requirements listed under user story US4-7 shall be implemented as follows:

R4-18-13-1 SMS provided by the Short Messaging Service over IP as defined in IR.92 shall be supported in LTE and EPC integrated Wi-Fi.

R4-18-13-2 SMS provided by the Short Messaging Service as defined in [3GPP TS 23.040] shall be supported in Legacy 3GPP access and LTE.

R4-18-13-3 MMS provided by the Multimedia Messaging Service as defined in 3GPP TS 22.140 and 3GPP TS 23.140 shall be supported in LTE, EPC integrated Wi-Fi and Legacy 3GPP access. For requirement R4-7-2 it shall be noted, that it describes the user perception. Sending and

receiving of MMS requires an access technology that allows user authentication for MMS. Consequently sending or receiving of MMS is not possible with non-integrated Wi-Fi as a bearer. In this case the device may establish temporarily an additional bearer satisfying the requirements at the time of a MMS send or receive event.

R4-18-13-4 RCS messaging services (RCS 1-to-1 Chat, RCS File Transfer, RCS Group Chat) shall be supported in Legacy 3GPP access, LTE, EPC integrated Wi-Fi and non-integrated Wi-Fi access. For devices supporting the IMS APN the operator shall be able to control the client policy to the use cellular and non-cellular data access for RCS services via the client configuration parameters ALWAYS USE IMS APN defined in section A.1.11 of [RCC.07] considering the additional definitions in section 15.4.1 of [RCC.60]. A device supporting and configured for the use of Voice over EPC-integrated Wi-Fi (IR.51 voice) is considered to be a "VoLTE device" for the purpose of the client implementation of the configuration parameter ALWAYS USE IMS APN.

R4-18-14 The requirements listed under user stories US4-8 through to US4-17 shall be implemented locally on the client. The following general procedural requirements shall be considered.

For requirements, related to the ‘Online experience’, where a client needs to determine the RCS registered status of the other party via capability discovery, the client implementation shall take the definitions of the automata tag in section 2.7.1.1 of [RCC.07] into account.

For the requirements, where a client needs to determine the messaging technology based on the network connection status and the device is in a situation where it attaches to the network anew (e.g. due to power-on or resume from airplane mode) it is recommended that the client awaits the completion of all network attach procedures first.

The determination of the integrated messaging capability of other RCS users is provided by the capability discovery of the Integrated Messaging capability as defined in section 2.4.3.2 of this document.

If the DELIVERY TIMEOUT timer expires (i.e. it was set to a value different from “0”) for a chat message or a File Transfer, the client shall either initiate a capability discovery to determine whether messaging technology is to be switched or inform the user as defined in the Operator Messaging requirements.

2.5 1-to-1 Chat

2.5.1 Description

1-to-1 Chat enables users to exchange chat messages with another party. This section describes the User Stories and Service Requirements for the core chat service and all features around the core.

Major changes of the RCS Pre-Universal profile PDD compared to the CPR PDD are:

- Enhanced procedures for Chat Message delivery to support possible fallback to SMS (Delivery Assurance).

- Integration of agreed simplifications and parameters.

2.5.2 User Stories and Feature Requirements

US5-1 **As a user, I want to send Chat messages to my contacts.**
As a user, I want a single environment for creating and viewing my messages, covering a multitude of different services. By having this convenience, I don't have to change apps to carry out similar messaging tasks.
As a user, I want full visibility about the Messaging Service that is used for sending a message or a file.

R5-1-1 Any RCS user shall be able and send a message to enabled contacts in the contact list or by entering the contact's MSISDN.

R5-1-2 If the required networks and clients support Delivery Assurance (CFS or NFS), then the procedures to determine the Operator Messaging Service (Chat or SMS) as described below (R5-1-4 and sub-requirements) shall apply. Requirements and procedures described in chapter 2.4 (Operator Messaging) are not relevant in this case.

R5-1-3 If the originating client is not aware that Delivery Assurance is available to send Operator Messages, the proposed messaging service shall be determined by Operator Messaging logic as described in chapter 2.4, as configured by the operator.

R5-1-4 Delivery Assurance shall be supported.

R5-1-4-1 'Chat' is proposed as the selected Messaging Service only for recipients known to be RCS users for which the messaging technology is not currently latched to SMS (only applies to CFS, see section R5-1-6-6) in each of the following cases:

R5-1-4-1-1 The A-party device is registered to the RCS platform.

NOTE: This includes connectivity via cellular coverage or Wi-Fi.

R5-1-4-1-2 The A-party device is in "Flight Mode", i.e. the user set the cellular data switch to off and the Circuit Switched (CS) connectivity is set to off.

R5-1-4-1-3 The A-party device is not connected to cellular coverage and the user has set the cellular data switch for home network on the device to "on".

NOTE: Messages shall be queued for delivery when the device is reconnected. The user shall be notified that these messages are queued for delivery.

R5-1-4-2 'SMS' is proposed as the Messaging Service in each of the following cases:

R5-1-4-2-1 The recipient is not known to be an RCS user.

R5-1-4-2-2 The recipient is an RCS user for whom the technology was latched to SMS (see section R5-1-6-6).

R5-1-4-2-3 The A-Party device is neither connected to cellular coverage nor registered to RCS and the user has set the cellular data switch for home network on the device to "off".

NOTE: Messages shall be queued for delivery when the device is reconnected. The user shall be notified that these messages are queued for delivery.

R5-1-4-2-4 The A-Party device is not online but is connected to cellular coverage.

R5-1-4-3 To ensure a good user experience, message duplicates shall be avoided as much as possible.

R5-1-4-4 The full content of the chat messages shall be delivered to the recipient irrespective of the messaging service that has been used (1-to-1 Chat or SMS).

R5-1-4-5 The A-Party user shall be able to differentiate Chat messages from SMS messages the user has created.

R5-1-4-6 The B-Party user shall be able to differentiate incoming chat messages from incoming SMS messages.

R5-1-5 If 1-to-1 Chat Messages cannot be instantly delivered by RCS, the terminating leg should invoke 'Network Fallback to SMS'.

NOTE: NFS does not influence the behaviour of legacy (BB or CPR) clients but optimizes the Chat message delivery whatever the originating client version.

R5-1-5-1 If the terminating leg indicates support of Network Fallback to SMS to the Pre-Universal profile A-Party client, the A-Party user shall not be prompted to send a chat message as SMS (i.e. no CFS).

R5-1-6 If 1-to-1 Chat Messages cannot be delivered by RCS within an operator configurable period of time, the client should invoke 'Client Fallback to SMS incl. Revocation' (CFS).

R5-1-6-1 The procedures of CFS shall be used on any Pre-Universal client only if the terminating leg has indicated the support for CFS.

NOTE: CFS does not influence the behaviour of legacy (BB or CPR) clients nor raise or lower the probability that a Chat message is delivered to the recipient if sent from a legacy client.

R5-1-6-2 While typing, Capability Discovery may change the messaging service to be used from SMS to Chat.

R5-1-6-3 The user shall have the option to manually select "revoke and re-send as SMS" for sent chat messages at any time before the message was confirmed as delivered or the operator configurable period of time expired. If delivery of a 1-to-1 Chat message could not be confirmed after an operator configurable period of time, the client shall offer and give the user the option to revoke and send the message as SMS.

R5-1-6-4 The user shall have the option to automate the user interaction for CFS. The following options shall be selectable:
- Always ask
- Never ask and always send as SMS
- Never ask and never send as SMS

R5-1-6-4-1 The user shall have the option to see this selection or change this decision at any point in the RCS settings section.

R5-1-6-4-2 The default for this setting shall be configurable by the operator.

NOTE: Steps 3 (R5-1-6-5-3 below) to Step 5 (R5-1-6-5-6 below) are only presented to the user if the device is configured to “Always Ask” and would be automatically processed accordingly if the device is configured to “Never Ask and always send as SMS”.

NOTE: The user selection to automatically send as SMS shall have no impact on MMS being used as a fallback for File Transfer.

R5-1-6-5 Details of how and when the revocation and send as SMS procedure shall be applied:

R5-1-6-5-1 Step 1: User A has created a Chat message and this message was sent.

R5-1-6-5-2 Step 2: Delivery for that Chat message has not yet been confirmed within an operator configurable period of time. If the A-Party device should have been offline during this period, the following Step 3 shall not be triggered until the A-Party device was ‘online’ for an operator configurable time after re-connection, to allow update of message status notifications.

R5-1-6-5-3 Step 3: The user is presented with a message “Your Chat message could not be delivered instantly, do you want to change to an SMS message?” and a confirmation request for the user to select (yes / no).

- If, during the display of that message, before user confirmation, a delivery notification for the Chat message is received, the user request from Step 4 shall be removed, and the original Chat message shall be indicated as ‘delivered’ (or ‘displayed’, if applicable).
- The user may have the option to remember this selection for future instances of this "Revocation and send as SMS" procedure. If the user has selected this, the selection shall be remembered in the user setting (R16-16-1). The user shall always have the option to undo this selection by changing the setting back to “Always ask”.

R5-1-6-5-4 Step 4a: If the user selects “Yes”, then

- a revocation for the original Chat message shall be triggered,
- the original Chat message shall be removed from the conversation history once the revocation has been confirmed successful, and
- a parallel SMS message shall be sent and appear in the conversation history, content similar to the original Chat message, the timestamp of the user confirmation with “yes” and the sending service indication “SMS”.

R5-1-6-5-5 Subsequent sent messages which are in ‘pending’ or ‘sent’ status shall be covered by that user selection (same procedure applies), latching as described in section R5-1-6-6 shall be applied.

Failure of one of these steps, shall not mean that the other steps shouldn’t be executed. This may lead to duplicated messages.

R5-1-6-5-6 Step 4b: If the user selects “No”, a revocation of the original Chat message shall not be triggered neither an SMS shall be sent. The Chat message status is updated according to the delivery status.

- The suggested messaging service shall remain Chat.
- The user shall not be asked again to revoke this message and sent as SMS.

R5-1-6-6 SMS Latching: When sending a message to a known CFS contact, a Pre-Universal client shall by default propose to use 1-to-1 Chat. If during the last message exchange the client had to fallback to SMS however and there has been no indication since that the contact is online again (e.g. capability exchange or use of another RCS service), SMS shall be used as the default messaging service. This means that once there has been a fallback to SMS, subsequent messages shall continue to be sent as SMS until RCS availability is confirmed.

R5-1-6-6-1 SMS shall also be used whenever the client has already fallen back to ‘SMS link’ for File Transfer: subsequent messages shall continue to be sent as SMS until RCS availability is confirmed (e.g. capability exchange or use of another RCS service).

R5-1-7 Before sending a message, the A-Party user shall be absolutely clear whether a message will be sent as SMS or Chat.

R5-1-7-1 When opening the conversation or before starting to enter the first character of a message, the client logic shall propose the Messaging Service (either SMS or Chat) to be used for that message.

R5-1-7-2 Before sending a message, the client shall indicate to the user whether a message will be sent as SMS or 1-to1 Chat.

R5-1-7-3 The user shall be able to change the proposed messaging service on a per message and on a general basis.

NOTE: Details of this function are specified in section US16-15.

NOTE: This shall be a “one click experience” on UI level.

R5-1-7-4 A manual user selection of a Messaging Service during an active conversation shall be persistent until either manually changed again by the user or until the user navigates out of the conversation thread.

R5-1-7-5 The creation of a new conversation shall trigger the automatic selection of the proposed Messaging Service.

R5-1-8 The user shall have the option to send a message at any time by entering an existing chat and continue.

R5-1-9 The Operator Messaging Application shall combine the composing of Chat Messages and File Transfer with SMS (and MMS, if configured by the operator) messages.

R5-1-10 All messaging entry points on a device shall ensure access to the full Operator Messaging experience.

NOTE: For native implementations.

US5-2 **As a user, I want to see the status of my sent Chat messages.**

R5-2-1 For A-Party, the following message states shall be supported:

R5-2-1-1 Message Pending: Transfer of the Chat message in progress (e.g. queuing on device).

R5-2-1-2 Message Sent: Confirmation that the message has been correctly accepted by the A-Party's network.

R5-2-1-3 Message Delivered: Confirmation that the message has been delivered to the B-Party device.

R5-2-1-3-1 For legacy SMS messages sent from a device, Delivery Notifications may be supported upon user choice or network default configuration.

R5-2-1-3-2 If a message was delivered applying NFS, the A-Party client shall be able to differentiate between a Chat message that was terminated as Chat and a Chat message that was terminated as SMS. For example, the user shall be able to understand whether or not to expect a Delivered Notification.

R5-2-1-4 Message Displayed: When the message has been displayed in the Chat view on the receiving device.

R5-2-1-4-1 For legacy SMS messages sent from a device, appropriate means shall be used to inform the user that "Message Displayed" is not available (e.g. by greying out Display Notification as soon as the Delivery Notification is displayed).

R5-2-1-4-2 If a message was delivered applying NFS, the A-Party client shall be able to differentiate between a Chat message that was terminated as Chat and a Chat message that was terminated as SMS. For example, the user shall be able to understand whether or not to expect a Display Notification.

R5-2-1-5 Message send failed: The expected outcome of the operation could not be confirmed by the network (in this case: Message Sent or Message Delivered status notification has not been received) and the device does not attempt to send the message again.

NOTE: Sending the message may be re-triggered manually by the user.

R5-2-2 If the sending device is not connected to RCS at the time a notification is received, notifications shall be stored on the network and forwarded once the sending device is online.

R5-2-3 Aggregation of Display notifications may be done: if it was confirmed the last message has been displayed, then all previously confirmed 'delivered' messages and files can be assumed displayed as well and the status may be aggregated in the last known 'displayed' status notification.

R5-2-4 The 'failed' status notification shall never be aggregated but presented separately to the user.

US5-3 **As a user, I want to include smileys into my Chat messages.**

R5-3-1 It shall be possible to add Emoji when creating a chat message by adding from a selection of graphical elements in the chat application.

NOTE: Standards for conversion of text strings to Emoji are described in Annex 'Emoticon conversion table', see Annex A.2.

R5-3-2 It shall be possible to add the basic Emoticons when creating a chat message by typing in the respective text string, separated by blank spaces (e.g. ";-) "converts to☺) or typing in the respective text string without blank spaces if the string is the only characters of the message content.

NOTE: The basic set of Emoticons is listed in the Annex 'Emoticon conversion table', see Annex A.2.

R5-3-3 Emoji shall be interpreted as detailed in the conversion table in the Annex of this document. The graphical elements that are used may vary from between implementations, but the conveyed meaning must not be changed.

R5-3-4 Emoticons from the basic set of Emoticons, which are received in Chat messages, shall be converted to graphics, if they were separated by blank spaces in messages (e.g. ";-)" converts to "☺") or without the blank spaces if the emoticon string is the only characters of the message content.

NOTE: The conversion of text strings to graphics for any type of smileys shall affect any representation of the messages on the user interface, that includes the conversation thread as well as any notifications or previews of messages in pop-ups or dedicated screens.

US5-4 **As a user, I want to use the text editing tools that are available on my device (e.g., but not limited to, copy paste, edit) for Chat messages.**

NOTE: In case of the user trying to paste an image into the text editor the device may ignore the user action.

R5-4-1 The user shall have the option to select text (e.g. from a message, a website or any other text source) and use text editing tools such as copy & paste to create messages.

US5-5 **As a user, I want to see when the other party is currently writing a Chat message.**

R5-5-1 The other party shall be able to see an "is typing" notification whenever a new Chat message is created.

US5-6 **As a user, I want to ensure that my messages reach their destination as reliably and quickly as possible.**

R5-6-1 To avoid a cluttered experience between Operator Messaging users and non-Integrated / non-Seamless Messaging RCS users, the user equipment shall be aware of the Integrated / Seamless Messaging capability of any of the RCS enabled contacts in order to adjust behaviour accordingly.

R5-6-2 The Operator shall ensure all 1-to-1 Chat messages and related messaging services originating from a device shall be conveyed in a manner that will ensure the quickest delivery to the recipient.

R5-6-2-1 Store and Forward shall be available and provided by every RCS Service Provider to host messages for its RCS users on the terminating leg when these users are offline.

US5-7 **As a user, I want to receive text Chat messages from my contacts.**
As a user, I want to see all messages and files exchanged with a contact in a single threaded view.
As a user, I want a single environment for creating and viewing my messages, covering a multitude of different services. By having this convenience, I don't have to change apps to carry out similar messaging tasks.

R5-7-1 Any RCS user shall be able to receive Chat message(s) that are sent to them.

R5-7-2 The user shall see any Messages and File Transfer events exchanged with a single contact grouped into one Conversation thread.

R5-7-2-1 Any application allowed to manage (read, write, view) xMS on a device shall also be allowed to manage (read, write, view) Chat messages. Any application allowed to manage (read, write, view) Chat on a device shall also be allowed to manage (read, write, view) xMS messages.

R5-7-2-2 Any application selected by the user as the default messaging application shall manage xMS and Chat messages (incl. File Transfer).

US5-8 **As a user, I can send a Chat message like a text and it is just delivered. B-Party does not need to accept the message.**

R5-8-1 Chat messages shall be received directly in the inbox; no handshake acceptance shall be required.

US5-9 **As a user, I want to send text Chat messages to my contacts even when they're temporarily offline (e.g. device switched off). I expect my contacts to receive these Chat messages when they come online again.**

R5-9-1 If the B-Party is currently not connected to the RCS service ("offline"), the message(s) shall be delivered once the user is back registered on RCS.

R5-9-2 The Operator shall be able to set the storage duration for Store and Forward cases (deferred messaging) based on its own individual Operator parameters.

NOTE: The parameters may be aligned at a local level as the terminating network storage time has an impact on the sending network's user experience.

US5-10 **As a user, I want to be notified when my device receives a new Chat Message.**

R5-10-1 On receiving a message, the user shall be notified with graphical and sound elements (similar as the device notifies of incoming SMS messages if not stated differently in this requirements document).

R5-10-2 Chat conversations shall elevate to the top of the conversation list on reception of a new message or file.

R5-10-3 Chat conversations with unread messages, unseen files or file download notifications shall be marked accordingly, e.g. by display of the subject line in bold font and / or an unread message counter.

US5-11 **As a user, I want notifications of rapidly sequenced incoming Chat Messages intelligibly aggregated and counted.**

R5-11-1 For audio notifications, device audio related settings shall prevail.

R5-11-2 Rapid sequence of incoming Chat messages in one conversation shall be consolidated into one audible notification per conversation. Consolidation of visual notifications is not affected.

R5-11-3 On selection of the visual notification for one or more new message(s) in a single Chat or Group Chat conversation, the user shall be forwarded to the respective Chat message and the visual notification shall be permanently removed from the notification centre or bar.

R5-11-4 On selection of the visual notification for two or more new messages from different Chat or Group Chat notifications, the user shall be forwarded to the list of Chat or Group Chat conversations. In this case, the unread message visual identifier shall be removed once the last new message was read. Alternatively, the OEM may handle it differently on the device (e.g. the visual notification disappears already after selecting the notification and seeing the list of Chat or Group Chat conversations).

R5-11-5 Any audible or visual notification shall be suppressed in case the reception is visible on the currently active screen of the device (e.g. if the user is currently on the Chat screen with a person and a Chat Message is received).

US5-12 **As a user, I want to view my sent and received Chat messages in a time-based order.**

R5-12-1 All messages exchanged with the same contact shall be threaded in the same chat thread in a timely order.

NOTE: Where a contact has multiple phone numbers, then a thread should be created for each phone number. The thread name should clearly show which identity is in use (e.g. work, home and so on).

R5-12-2 The order of messages shall be in line with the order messages have been sent and received on the device.

R5-12-3 Incoming and outgoing messages shall be displayed interlaced.

R5-12-4 Sent messages shall be inserted into the conversation thread as they have been created.

US5-13 **As a user, I want to see the timestamp associated with each of my sent and received messages.**

R5-13-1 The date and time associated with each chat message shall be displayed adjusted to the current device date and time.

R5-13-1-1 This timestamp shall be generated for sent messages by the device in a consistent way as timestamps are generated for other device functions, e.g. SMS.

R5-13-1-2 Timestamps for received messages shall be based on the UTC timestamp that comes with each message, aligned with the selected device time zone.

US5-14 **As a user, I want conversations which contain unread messages to be differentiated from conversations that contain messages I have seen.**

NOTE1: This requirement shall be valid for Messaging for Multi-Device as well.

NOTE2: Unseen files or file download notifications cover events that use File Transfer as an enabler e.g. but not limited to, Geolocation Push, Audio Messaging or vCard share.

R5-14-1 Conversations with unread messages or unseen files or file download notifications shall be marked accordingly, e.g. by display of subject line in bold font and / or an unread message counter.

R5-14-2 The visual notification shall be permanently removed after the user has opened the message

R5-14-3 Conversations shall, elevate to the top of the Chat or Group Chat conversation list on reception of a new message.

R5-14-4 If the device supports a notification LED (for screen-off notification) then this LED shall flash as long as there are unread RCS messages. The colour should differentiate from notifications of other applications, but may be identical for all Operator Messaging Services.

US5-15 **As a user, I want the contact names of Chat conversations to be aligned with the according contact card (i.e. if a contact I am in a Chat conversation with is in my contact list, the identifying MSISDN shall be replaced with the name from the contact card).**

R5-15-1 If the sender of a Chat message is in my contact list, the MSISDN shall be replaced with the sender's name on the contact list in any representations where the message sender is represented.

R5-15-2 If the sender of a Chat message is not in my contact list, the sender's RCS Alias name, if available, shall be presented in addition to the sender's MSISDN.

R5-15-3 In case the Alias is being used to represent the sender's identity, the device UI shall use appropriate means to make it clear that the Alias name is unverified information.

NOTE: The Alias as specified in RCS is created by the message sender and could be set to any possible name, the real name of the person, or a nickname or in extreme cases – in an attempt of identity spoofing – the sender could try to pretend to have a false identity.

US5-16 **As a user, I don't want to feel restricted by Chat message size limits.**

R5-16-1 Chat messages (incoming and outgoing) shall allow the user to send and receive messages with up to 3000 characters.

NOTE: Operator defined parameter.

US5-17 **As a user, I want to exchange multi-media content in my Chat conversations (e.g. but not limited to, take an instant picture from camera and send from within the chat).**

NOTE: Details on multi-media content are covered in File Transfer incl. Geolocation Push, see Section 2.7.

R5-17-1 The user shall be able to select and send Multi Media in Chat conversations.

R5-17-2 The user shall be able to receive Multi Media in Chat conversations.

R5-17-3 The user shall be able to browse any media that was exchanged in the particular 1-to-1 Chat in an aggregated view.

US5-18 **As a user, I want to maintain multiple conversations in parallel.**

NOTE: These conversations may be one-to-one or Group Chat conversations.

R5-18-1 Multiple parallel Chat and Group conversations shall be supported at any given point in time.

US5-19 **As a user, I want to easily and quickly switch between multiple parallel Conversations.**

NOTE: These conversations may be One-to-One or Group Chat conversations.

R5-19-1 The device shall offer the option to switch between conversations easily and quickly.

US5-20 **As a user, I want to delete complete conversations.**
As a user, I want to select and delete single and multiple chat messages in a chat thread.

R5-20-1 The user shall have the option to delete a single Chat message from a conversation.

R5-20-2 The user shall have the option to delete single and multiple Chat messages in a chat thread.

R5-20-3 The user shall have the option to delete an entire conversation.

US5-21 **As a user, I want to be able to forward a single sent or received chat message to one or more contacts.**

NOTE: This may be performed by the user by copying existing message text and pasting into a new Chat message.

R5-21-1 The user shall have the option to forward a single sent or received Chat message to one or more contacts.

NOTE: This function may be executed using the copy and paste text editor function on the device.

US5-22 **As a user, I want to switch to a voice or video call during a conversation - and return to chat when the call is finished.**

R5-22-1 The user shall have the option to access voice calls easily from the Chat UI with the contact in the conversation. After the call has ended, the user can return to the conversation.

R5-22-2 The user shall be able to receive a voice call when actively engaged in a conversation and return to the chat when the voice call was ended.

R5-22-3 The user shall have the option to access video calls easily from the Chat UI with the contact in the conversation. After the call has ended, the user can return to the conversation.

R5-22-4 The user shall be able to receive a video call when actively engaged in a Chat or Group Chat conversation and return to the chat when the video call ends.

2.5.3 Technical Information

2.5.3.1 Overview

To ensure timely delivery of messages when possible, SMS shall be used as a fallback technology when chat is unavailable. This fallback can be provided by either the client that originally sent the message or the network. In the former case and if supported by the network, before doing the fallback the client shall revoke the chat message to avoid the duplicate delivery. For the case of network fallback, this profile assumes fallback on the network serving the recipient of the message. Fallback on the network serving the sender of the message is out of the scope. The 1-to-1 Chat service is provided as defined in section 5.3 of [RCC.60] extended by functionality provided in this section.

For the case of client fallback, message revocation (if it is supported) shall be implemented as defined in section 3.3.4.1.10 of [RCS6.0] with the additional clarifications and requirements described in section 2.5.3.5 of this document.

If there is no network support for client or network fallback mechanisms, message delivery shall follow the procedures described in section 2.4.3.

2.5.3.2 Network Fallback Support Capability

The Delivery Assurance in this profile relies on a capability indication mechanism during the initiation of a 1-to-1 Chat session and as a service provider option during the capability discovery. The capability indication is used so as the network to indicate to a client which fallback mechanism shall be applied for messages sent by this client in 1-to-1 chat sessions. The capability indication is used by the network to indicate its support for either

- the network fallback procedure, where the network is responsible for providing the fallback (also called Network Fallback to SMS, or NFS), or
- the message revocation, where the client is responsible for the fallback (also called Client Fallback to SMS or CFS).

The indication is provided by the feature tags defined in Table 8.

tag	Description
+g.gsma.rcs.msgrevoke	Message Revocation is supported (as defined in section 3.3.4.1.10.3 of [RCS6.0])
+g.gsma.rcs.msgfallback	Network interworking is supported

Table 8: Feature tags used to indicate network support for fallback mechanisms

A network shall include at most one of these feature tags (i.e. they are mutually exclusive), but may include none if neither the revocation procedure nor the network fallback is supported.

A client receiving a network indication for the network support of a fallback mechanism shall cache this indication for the contact it relates to for future use. The client shall consider the stored network indication for as long as it considers the contact to be RCS capable. These cached values shall affect the capability exchange triggers (see sections 2.3 and 2.5.3.3.1) and behaviour of the client when the network cannot indicate its capabilities (e.g. if a 486 response is returned).

If the network indicates support of network fallback, it shall take responsibility for delivering the message using the most suitable path. Therefore if the terminating network has provided this indication the client shall not apply procedures to monitor the delivery of chat messages and fallback.

If the network doesn't provide any of these feature tags, the value of the IM CAP ALWAYS ON client configuration parameter shall be used to determine the message technology selected by the client and to control whether it monitors the delivery of the message, as defined in [RCC.60]. If however the network provides these feature tags, the behaviour of the client is not impacted by the value of the IM CAP ALWAYS ON client configuration parameter. When the CHAT REVOKE TIMER parameter is set to 0 and the network indicated capability is message revocation then the client behaviour is based on the value of the IM CAP ALWAYS ON parameter.

2.5.3.3 Client behaviour

2.5.3.3.1 Capability Exchange

A client receiving the feature tag for network interworking as defined in Table 8

- in the Contact header field of OPTIONS requests for capability discovery
- in the Contact header field of field of 200 OK responses for OPTIONS requests for capability discovery

shall cache the capability for the contact for future use.

A client receiving the feature tag for message revocation support as defined in Table 8

- in the Contact header field of OPTIONS requests for capability discovery
- in the Contact header field of field of 200 OK responses for OPTIONS requests for capability discovery

shall cache the capability for the contact for future use if the CHAT REVOKE TIMER client configuration parameter has been configured with a non zero value and SMS fall-back is enabled on the client (e.g. user has not disabled it via client settings), otherwise if the client had cached that the terminating network supported interworking, then the client shall discard this cached value.

If the SIP OPTIONS requests or responses do not include any of those capabilities though, the cache shall not be updated because this inclusion is not mandatory.

2.5.3.3.2 Messaging Technology selection

The technology selected for the first message in a 1-to-1 Conversation shall be as follows based on the last known status of the contact (i.e. the last capability exchange that was

executed according to the triggers defined in section 2.3) and the cached capabilities of the network serving the contact if any:

	B-Party non-RCS	RCS capable B-party online	RCS capable B-party offline
No support for message revocation or interworking or no capabilities cached	SMS	As in [RCC.60]	As in [RCC.60]
Message revocation supported	SMS	Chat unless latched to SMS	Chat unless latched to SMS
Interworking supported	SMS	Chat	Chat

Table 9: Messaging technology selection

2.5.3.3.3 Fallback procedure management

When initiating a 1-to-1 Chat session, a client complying with the profile defined in this document shall monitor the delivery of the messages exchanged in the session based on the feature tags defined in Table 8:

- Until a final response is received, the client shall monitor the delivery of the message included in the SIP INVITE based on the cached capabilities of the network serving the contact. If such capabilities are not available, the client shall assume that neither message revocation nor network interworking are supported and monitor the delivery as defined in [RCC.60], i.e. based on the value of the IM CAP ALWAYS ON and, if applicable, the DELIVERY TIMEOUT client configuration parameters.
- If a SIP 200 OK response is received as final response, the client shall behave as follows based on the presence of feature tags defined in Table 8:
    - If the Contact header in the 200 OK response didn't include any of the feature tags defined in Table 8 or it included the message revocation feature tags defined in Table 8 while the CHAT REVOKE TIMER client configuration parameter is configured with the value 0 or SMS fall-back is disabled on the client, the client shall discard any cached value on what the terminating network supports and start or continue monitoring the delivery of the message that was included in the SIP INVITE request and apply monitoring for any subsequent messages according to the process defined in [RCC.60].
    - If the Contact header in the 200 OK response includes the message revocation feature tags defined in Table 8 and the CHAT REVOKE TIMER client configuration parameter is set to a value higher than 0 and SMS fall-back is enabled on the client, the client shall cache that the terminating network supports message revocation and shall start or continue monitoring the delivery of the message included in the SIP INVITE request and apply monitoring for any further messages as defined in section 3.3.4.1.10.1.1 of [RCS6.0] (i.e. through a timer based on the CHAT REVOKE TIMER client configuration parameter).

- If the Contact header in the 200 OK response includes the interworking feature tag defined in Table 8 the client shall cache that the terminating network supports interworking and shall stop monitoring (if applicable) the delivery of the message included in the SIP INVITE request and not monitor the delivery of further messages that it sends in the Chat.

- If a SIP 486 response is received as final response, the client shall behave as follows:
  - If the client monitors the delivery of the message, then the client shall continue monitoring the delivery based on the cached capabilities.
  - If the client does not monitor the delivery, then the client shall start monitoring the delivery of the message included in the SIP INVITE request as defined in [RCC.60], i.e. based on the value of the IM CAP ALWAYS ON and, if applicable, the DELIVERY TIMEOUT client configuration parameters. If the client had cached that the terminating network supported interworking, then the client shall discard this cached value.

A summary of the main cases for a client initiating a 1-to-1 Chat is provided in the following table:

Received response → / Cached support	**200 OK without feature tags**	**200 OK with message revocation Feature tag**	**200 OK with interworking Feature tag**	**486 Busy Here**
No support for message revocation or interworking or no capabilities cached	[RCC.60] procedures	section 3.3.4.1.10.1.1 of [RCS6.0] unless CHAT REVOKE TIMER is set to 0 or SMS fall-back is disabled on the client in which case [RCC.60] procedures apply	No client-side monitoring	[RCC.60] procedures
Message revocation supported	[RCC.60] procedures	section 3.3.4.1.10.1.1 of [RCS6.0] unless CHAT REVOKE TIMER is set to 0 or SMS fall-back is disabled on the client in which case [RCC.60] procedures apply	No client-side monitoring	section 3.3.4.1.10.1.1 of [RCS6.0] unless CHAT REVOKE TIMER is set to 0 or SMS fall-back is disabled on the client in which case [RCC.60] procedures apply
Interworking supported	[RCC.60] procedures	section 3.3.4.1.10.1.1 of [RCS6.0] unless CHAT REVOKE TIMER is set to 0 or SMS fall-back is	No client-side monitoring	[RCC.60]procedures

		disabled on the client in which case [RCC.60] procedures apply		

Table 10: Client-side message delivery monitoring

For a client invited to a 1-to-1 Chat session (excluding a session for delivering stored messages or notifications), behaviour shall be as follows:

- If the Contact header field included in the SIP INVITE request does not include any of the feature tags defined in Table 8 or it included the message revocation feature tags defined in Table 8 while the CHAT REVOKE TIMER client configuration parameter is configured with the value 0 or SMS fall-back is disabled on the client, the client shall discard any cached value on what the network terminating its messages supports and monitor the delivery of any messages that it sends in the Chat session according to the process defined in [RCC.60].
- If the Contact header in the SIP INVITE request includes the message revocation feature tags defined in Table 8 and the CHAT REVOKE TIMER client configuration parameter is set to a value higher than 0 and SMS fall-back is enabled on the client, the client shall cache that the network terminating its messages supports message revocation and shall monitor the delivery of any messages that it sends in the Chat session as defined in section 3.3.4.1.10.1.1 of [RCS6.0] (i.e. through a timer based on the CHAT REVOKE TIMER client configuration parameter).
- If the Contact header in the SIP INVITE request includes the interworking feature tag defined in Table 8 the client shall cache that the network terminating its messages supports interworking and shall not monitor the delivery of the messages that it sends in the Chat session.

2.5.3.3.4 Procedures for Client Fall-back

If according to the procedures defined in section 2.5.3.3.3 the client runs for messages in a conversation a timer based on the CHAT REVOKE TIMER client configuration parameter and the client receives "delivery" disposition notifications for all messages in the conversation, then the client shall stop the timer.

The client shall start a timer based on the CHAT REVOKE TIMER client configuration parameter for the next message sent in the conversation considering the message revocation capability cached in accordance with the procedures defined in section 2.5.3.3.3.

1. If the timer based on the CHAT REVOKE TIMER client configuration parameter is running for at least one conversation and if
    a. the client registers in IMS successfully due to a previous de-registration (e.g. due to user setting or data-off) and if the value of the RECONNECT GUARD TIMER configuration parameter defined in section 2.5.3.6 is not set to "0", then the client shall start the reconnection guard timer with the value provided in the RECONNECT GUARD TIMER configuration parameter defined in section 2.5.3.6, or
    b. the client re-connects to the P-CSCF due to a previous loss of connection to the P-CSCF and if the value of the RECONNECT GUARD TIMER configuration

parameter defined in section 2.5.3.6 is not set to "0", then the client shall start the reconnection guard timer with the value provided in the RECONNECT GUARD TIMER configuration parameter defined in section 2.5.3.6.

c. The reconnect guard timer shall start if
    i. a success response is received from the network for an initial registration or re-registration resulting from the client procedures to re-connect to the P-CSCF, otherwise
    ii. at the time of P-CSCF connection re-gain.

2. If the timer based on the CHAT REVOKE TIMER client configuration parameter expires, then processing commences with step 3.
3. The client shall check whether the reconnection guard timer is running. If yes, then processing commences with step 5, otherwise processing commences with step 4.
4. If the client
    a. is not registered in IMS due to missing data connection (e.g. data off, loss of connection to the P-CSCF and registration expired), then the client shall wait until data connection is regained.
    If the data connection is regained then the client shall send an initial registration as per procedures of section 2.4 of [RCC.07].
    b. has stored a valid IMS registration but it has previously detected a loss of connection to the P-CSCF, then the client shall wait until data connection is regained.
    If the data connection is regained
        i. and the IMS registration is valid (e.g. registration is not expired, the client IP address did not change, access network did not change), then the client shall send a re-registration as per procedures of section 2.4 of [RCC.07].
        ii. and the IMS registration is not valid (e.g. registration is expired, the client IP address did change), then the client shall send an initial registration as per procedures of section 2.4 of [RCC.07].
    If the initial registration or the re-registration is successful, then
        iii. if the value of the RECONNECT GUARD TIMER configuration parameter defined in section 2.5.3.6 is set to "0" then processing commences with step 6.
        iv. otherwise, the client shall start the reconnection guard timer with the value provided in the RECONNECT GUARD TIMER configuration parameter defined in section 2.5.3.6. Processing commences with step 5.
    c. otherwise, in all other cases where the client is registered in IMS, processing commences in step 6.
5. If the reconnection guard timer is running and
    a. if "delivery" disposition notifications have been received for all messages in the conversation, then the reconnection guard timer shall be stopped by the client. The client shall stop the message fall-back processing.
    b. if the client detects a loss of connection to the P-CSCF or it is de-registered, the reconnection guard timer is stopped and processing commences with step 4
    c. If the reconnection guard timer expires the processing commences with step 6.

6. The client shall verify whether connectivity for sending SMS messages exists. If connectivity for sending of SMS messages exists, then processing commences with step 7. Otherwise, the client
    a. shall wait until connectivity for SMS is regained again.
    b. If the connection to the P-CSCF is lost or the client is de-registered from IMS while waiting for connectivity for sending of SMS messages, the client shall stop waiting for SMS connectivity and continue processing in step 4.
    c. If "delivery" disposition notifications have been received for all messages in the conversation, then the client shall stop waiting for SMS connectivity. The client shall stop the SMS fall-back processing.
    d. Once connectivity for sending SMS is regained, then processing commences with step 7.
7. If a user authorisation is required for the SMS fall-back for this conversation, then the client shall invoke an user interaction. Otherwise processing commences with step 8.
    a. If the client receives "delivered" disposition notifications for all messages in the conversation, then the client shall abort the user interaction and stop the message fall-back processing.
    b. If the user interaction results in the user authorisation of the SMS fall-back, then the procedure commences with step 4. The client shall retain the user authorisation of the SMS fall-back for the subsequent processing, i.e. the client shall not invoke the user interaction again.
    c. If the user interaction results in rejection of the message fall-back, then the client shall stop message fall-back processing.
8. The client shall create a Message Revoke request for the oldest chat message of the conversation for which no "delivered" disposition notification has been received and which has not been processed for SMS fall-back. The client shall send the Message Revoke request to the network. If the value of the configuration parameter CFS TRIGGER defined in section 2.5.3.6
    a. is set to "1", then
        i. if the Message Revocation request fails due to loss of connection to the P-CSCF, then the client shall continue processing with step 4.
        ii. if the client receives a success response (200 OK) to the Message Revoke request, then the client shall
            1. start an operation timer to supervise the processing of the Message Revocation, otherwise
            2. not send a fall-back SMS and consider the chat message as processed for SMS fall-back. The client shall continue with the procedure in step 8 until all messages in the conversation have been processed.
        iii. If the client receives a Message Revocation response from the network with a "success" result, then the client shall stop the operation timer and shall send the fall-back SMS following the procedures for fall-back according to the type of message (e.g. chat message, file transfer).
        iv. If the client receives a Message Revocation response from the network with a "failure" result, then the client shall stop the operation timer and shall not send the fall-back SMS and consider the chat message as processed for SMS fall-back. The client shall continue with the

procedure in step 8 until all messages in the conversation have been processed.

v. If the client detects a loss of connection to the P-CSCF or the client is de-registered from IMS (e.g. due to user settings), then the client shall stop the operation timer and shall send the fall-back SMS following the procedures for fall-back according to the type of message (e.g. chat message, file transfer). If there is at least one message in the conversation for which no "delivery" notification has been received and which has not been processed for SMS fall-back the client shall continue processing with step 4, otherwise is shall stop SMS fall-back handling.

vi. If the operation timer expires then the client shall send the fall-back SMS following the procedures for fall-back according to the type of message (e.g. chat message, file transfer).

vii. If submission of the SMS to the network fails (e.g. no SMS connectivity), then the client shall suspend the processing of SMS fall-back and apply the client procedures for the handling of failed SMS message submissions.

viii. If the submission of the SMS is confirmed by the network with a success response, then the client shall consider the chat message as processed for SMS fall-back. The client shall continue with the procedure in step 8 until all messages in the conversation have been processed.

ix. If the submission of the SMS is rejected by the network with a failure response, then the client shall stop processing of the SMS fall-back and apply the client procedures for the handling rejected SMS message submissions

b. is set to "0" or is not present then the client shall send the fall-back SMS following the procedures for fall-back according to the type of message (e.g. chat message, file transfer) and the Message Revoke request at the same time.

i. If the Message Revoke request fails due to loss of connection to the P-CSCF and there is at least one message in the conversation for which no "delivery" notification has been received and which has not been processed for SMS fall-back, then the client shall continue processing with step 4, otherwise the client shall stop processing of SMS fall-back.

ii. If submission of the SMS to the network fails (e.g. no SMS connectivity), then the client shall suspend the processing of SMS fall-back and apply the client procedures for the handling failed SMS message submissions.

iii. If the submission of the SMS is confirmed by the network with a success response, then the client shall consider the chat message as processed for SMS fall-back. The client shall continue with the procedure in step 8 until all messages in the conversation have been processed.

iv. If the submission of the SMS is rejected by the network with a failure response, then the client shall stop processing of the SMS fall-back and apply the client procedures for the handling rejected SMS message submissions.

v. The outcome of the Message Revocation operation does not alter the processing requirements of the client with regard to SMS fall-back.

However the client may need to inspect the outcome of the Message Revocation operation to satisfy the requirements for the presentation of the message status to the user.

2.5.3.3.5 Disposition Notifications

For the message included in the SIP INVITE, the client shall independently of the cached support of the terminating network request an Interworking Disposition Notification as defined in Appendix O of [RCC.11] in the IMDN Disposition-Notification CPIM header. As defined in [RCC.07], the client shall also request a Delivery and a Display Disposition Notification. For messages sent in a Chat session, the client shall request in the IMDN Disposition-Notification CPIM header an Interworking Disposition Notification as defined in Appendix O of [RCC.11] if during the setup of the session the terminating network has indicated support for interworking using the corresponding feature tag defined in Table 8. Also in this case the client shall do this in addition to the Delivery and Display notification.

When receiving an Interworking Disposition Notification as defined in Appendix O of [RCC.11], the client shall consider the message to have been delivered and interworked. The client shall thus not assume that a Delivery notification will follow.

2.5.3.4 Network Behaviour

2.5.3.4.1 Capability Exchange

When handling an OPTIONS request for capability discovery, an entity (e.g. a Session Border Controller) in the originating network supporting message revocation or interworking may add the corresponding feature tag defined in Table 8 in the Contact header field of the OPTIONS request sent towards the terminating client.

When handling an OPTIONS request for capability discovery, an entity (e.g. a Session Border Controller) in the terminating network supporting message revocation or interworking may add the corresponding feature tag defined in Table 8 in the Contact header field of any 200 OK response to the OPTIONS request sent towards the originating client.

NOTE: It is not mandatory for a network supporting Message Revocation or Interworking to indicate this as part of the capability exchange.

2.5.3.4.2 Fallback Mechanism Management

When handling an SIP INVITE request for a 1-to-1 Chat session, the messaging server in the originating network supporting message revocation or interworking shall add the corresponding feature tag defined in Table 8 in the Contact header field of the SIP INVITE request sent towards the terminating client.

When handling an SIP INVITE request for a 1-to-1 Chat session, the messaging server in the terminating network supporting message revocation or interworking shall ensure that the corresponding feature tag defined in Table 8 is included in the Contact header field in any 200 OK to the SIP INVITE request sent towards the originating client.

NOTE: It is the intention that networks shall support either message revocation or interworking. Since this will require changes in current networks, to allow for

transition, it is not mandatory in this profile for a network to support one of message revocation or interworking.

When supporting interworking, a terminating network shall not return a SIP 486 response to a SIP INVITE request for a 1-to-1 Chat session. A SIP 200 OK response will be returned in all cases since the network takes responsibility for delivering the message in the best way possible regardless of the connectivity status of the client. Therefore the network will in that case always be able to provide the indication that it takes responsibility for delivering the message.

2.5.3.4.3 Indicate delivery as SMS

When a network complying with the profile defined in this document supports interworking and it delivers the message through interworking to SMS, it shall generate an interworking notification as defined in Appendix O of [RCC.11] when such a notification was requested in the IMDN Disposition-Notification CPIM header of the message that was interworked. In that case, the network shall not generate a Delivery disposition notification. If IMDN Disposition-Notification CPIM header didn't include a request for an interworking notification, the network shall generate a Delivery Notification instead.

NOTE: Since according to section 2.5.3.3.5 a client complying with this profile will always have requested an interworking notification, this requirement to generate a regular Delivery notification is intended to support legacy clients.

2.5.3.5 Message revocation

Message Revocation shall be implemented as defined in section 3.3.4.1.10 of [RCS6.0], but only the client of the sender of the message shall initiate the MessageRevoke request. Section 3.3.4.1.10.1.2 of [RCS6.0] for MessageRevoke requests sent by the Messaging Server is not applicable. Additional clarifications and requirements apply:

- The Service Provider policy defined in section 3.3.4.1.10.1.1 to send Message Revoke requests in the case that a 486 Busy Here response is received does not apply. Instead the client shall initiate a Message Revoke request based on the procedures described in section 2.5.3.3.3.
- Message revocation is applicable for chat messages used for File Transfer via HTTP or Geolocation Push if an appropriate fallback mechanism is applicable for the message, e.g. as defined in section 2.7.

- Message Revoke requests and MessageRevokeResponse requests are not sent with CPIM headers, and a delivery and/or displayed notification shall not be requested.
- There is no store and forward for the Message Revoke requests and the MessageRevokeResponse requests.

- For the Message Revoke request section 3.3.4.1.10.1.1 of [RCS6.0] applies. The client shall send a SIP MESSAGE request according to the rules and procedures of [RCC.12] with the clarifications listed here. In this SIP MESSAGE request, the client:

    1. shall include an Accept-Contact header field with the OMA SIMPLE IM feature tag as is already the case for IMDNs carried in SIP MESSAGE requests;

2. shall add a dedicated Accept-Contact header field carrying the Message Revoke feature tag defined in section 3.3.4.1.10.3 of [RCS6.0] along with the *require* and *explicit* parameters;
3. shall include the Content-Type header field with the value set to the message revocation content-type application/vnd.gsma.rcsrevoke+xml, as described in section 3.3.4.1.10.4 of [RCS6.0];
4. shall include the address of the originating RCS Client that has been authenticated as per section 2.5 of [RCC.07] and [RCC.12];
5. shall include a User-Agent header field as specified in [RCC.12];
6. shall set the Request-URI of the Message Revoke request to the address of the target contact of the message that is requested to be revoked;
7. shall not include the device identifier of the original sender of the message in the MessageRevokeResponse request;
8. shall set the body of the Message Revoke request, as follows:
    a. The <Message-ID> element set to the value of the imdn.message-ID of the original message that is requested to be revoked,
    b. The <From> element set to the URI of the sender of the message,
    c. The <To> element set to the URI of the recipient of the message.
9. similar to section 8.1.1 of [RCC.12] for IMDNs, shall not include a Contribution-ID;
10. shall send the SIP MESSAGE request according to the rules and procedures of [RCC.12].

- For the MessageRevokeResponse request section 3.3.4.1.10.2 of [RCS6.0] applies. The Messaging Server shall send a SIP MESSAGE request according to the rules and procedures of [RCC.12] with the clarifications listed here. In this SIP MESSAGE request, the Messaging Server handling the Message Revoke request:

    1. shall include an Accept-Contact header field with the OMA SIMPLE IM feature tag as it is already the case for IMDNs carried in SIP MESSAGE requests;
    2. shall add a dedicated Accept-Contact header field carrying the Message Revoke feature tag defined in section 3.3.4.1.10.3 of [RCS6.0] without the *require* and *explicit* parameters;
    3. shall include the Content-Type header field with the value set to the message revocation content-type application/vnd.gsma.rcsrevoke+xml as described in section 3.3.4.1.10.4 of [RCS6.0];
    4. shall include the address of the intended recipient RCS Client, where the Messaging Server initiates the MessageRevokeResponse on behalf of the intended recipient that has been authenticated as per section 2.5 of [RCC.07] and [RCC.12];
    5. shall include a User-Agent header field of the Messaging Server as specified in [RCC.12];
    6. shall set the Request-URI of the MessageRevokeResponse request to the address of the contact that sent the message that is requested to be revoked;
    7. shall set the body of the MessageRevokeResponse request, as follows:
        a. The <Message-ID> element set to the value of the imdn.message-ID of the original message that is requested to be revoked,
        b. The <From> element set to the URI of the sender of the message,

c. The <To> element set to the URI of the recipient of the message,
d. The <result> element set to the revoke result;

8. similar to section 8.1.1 of [RCC.12] for IMDNs, shall not include a Contribution-ID;
9. shall send the SIP MESSAGE request according to the rules and procedures of [RCC.12].

- For messages that are under retry delivery attempt due to Messaging Server store and forward functionality, the result of the MessageRevokeResponse shall be “failed”.
- The client shall ignore any MessageRevokeResponse request for messages where no Message Revoke request has been sent.

NOTE: A Messaging Server on the originating side that is compliant to [RCC.12] but does not support Message Revocation might not transparently pass along a received SIP MESSAGE request carrying a Revoke XML body. In that case the Messaging Server might reject the SIP MESSAGE request because it is not CPIM wrapped, or because it does not support the Revoke Content-Type described in section 3.3.4.1.10.4 of [RCS6.0] or it might accept the SIP MESSAGE request, but might not copy over the Revoke related feature tags when it acts as a B2BUA. It is suggested that Service Providers operation such a Messaging Server do either not enable Message Revocation on their users’ clients requests (i.e. CHAT REVOKE TIMER client configuration parameter value set to “0”) or configure their IMS Core network to not send a SIP MESSAGE request with a Revoke feature tag as defined in section 3.3.4.1.10.3 of [RCS6.0] to their Messaging Server.

2.5.3.6 Configuration Parameter Changes

To provide the required operator control of the Delivery Assurance behaviour, the following parameters are added to those available in [RCC.60]:

Configuration parameter	Description	RCS usage
MESSAGING FALLBACK DEFAULT	This parameter controls the default setting for the client switch controlling the user dialog when according to the rules in section 2.5.2 a Chat message should be resent as SMS, The default can be set to **0 (Default Value),** never ask the user to confirm the retransmission as SMS and always send as SMS, **-1,** never ask the user to confirm the retransmission as SMS and never send as SMS **1**, always ask the user to confirm whether the message should be sent as SMS instead.	Optional parameter
RECONNECT GUARD TIMER	This parameter provides the minimum time the client shall be registered in IMS prior to sending a message revocation request for a chat message when the revocation timer (i.e. CHAT REVOKE TIMER) expired. Default value: 120 seconds	Optional parameter

CFS TRIGGER	This parameter controls the trigger for the client to fallback to SMS when revocation procedures apply. 0 (default), the client shall fall back to SMS in parallel with sending the Message Revoke request 1, the client shall fall back to SMS right after receiving the MessageRevokeResponse request with the value of the result equal to “success”	Optional parameter

Table 11: Additional Configuration Parameters to control Delivery Assurance behaviour

The UX tree defined in section 4.3.3 of [RCC.60] is extended as follows to provide the formal definition of the MESSAGING FALLBACK DEFAULT parameter:

Node: <x>/msgFBDefault

Leaf node that describes the default setting of the switch controlling whether the user should confirm a retransmission of a Chat message as SMS.

Status	Occurrence	Format	Min. Access Types
Required	ZeroOrOne	int	Get, Replace

Table 12: joyn UX MO sub tree addition parameters (msgFBDefault)

- Values:
  -1, the default setting of the switch is to never ask the user to confirm the retransmission and never do the fallback
  0, the default setting of the switch is to never ask the user to confirm the retransmission and always do the fallback.
  1, the default setting of the switch is to always ask the user to confirm the retransmission as SMS
- Post-reconfiguration actions: Change the setting of the switch, if it hasn’t been toggled by the user before.
- Associated HTTP XML parameter ID: “msgFBDefault”

This lead to the following UX tree

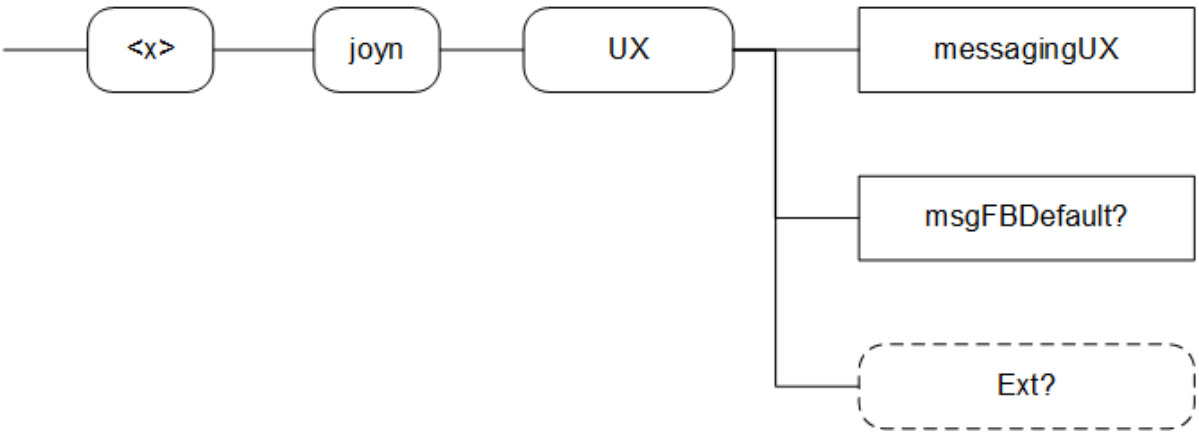

Figure 10: UX MO tree

The associated HTTP configuration XML structure is presented in the table below:

```
<characteristic type="UX">
        <parm name="messagingUX" value="X"/>
        <parm name="msgFBDefault" value="X"/><characteristic type="Ext"/>
</characteristic>
```

Table 13: UX MO sub tree associated HTTP configuration XML structure

The RECONNECT GUARD TIMER and CFS TRIGGER parameters are formally added to the joyn Messaging subtree defined in section 4.3.3 of [RCC.60] with the following formal definition:

Node: <x>/joyn/Messaging/reconnectGuardTimer

Leaf node that provides the minimum time the client shall be registered in IMS prior to sending a message revocation request for a chat message.

Status	Occurrence	Format	Min. Access Types
Required	ZeroOrOne	int	Get, Replace

Table 14: joyn Messaging MO sub tree addition parameters (reconnectGuardTimer)

- Values: integer value defining the timeout to be used in seconds
- Post-reconfiguration actions: Start using the provided value the next time when regaining connectivity while a Chat message is pending to be delivered.
- Associated HTTP XML parameter ID: “reconnectGuardTimer”

Node: <x>/joyn/Messaging/cfsTrigger

Leaf node that controls the client trigger to fallback to SMS when revocation procedures apply.

Status	Occurrence	Format	Min. Access Types
Required	ZeroOrOne	bool	Get, Replace

Table 15: joyn Messaging MO sub tree addition parameters (cfsTrigger)

- Values:
  0 (default): the client shall fall back to SMS in parallel with sending the Message Revoke request
  1: the client shall fall back to SMS right after receiving the MessageRevokeResponse request with the value of the result equal to “success”
- Post-reconfiguration actions: Start using the provided value the next time revocation request shall be sent.
- Associated HTTP XML parameter ID: “cfsTrigger”

This lead to the following Messaging tree

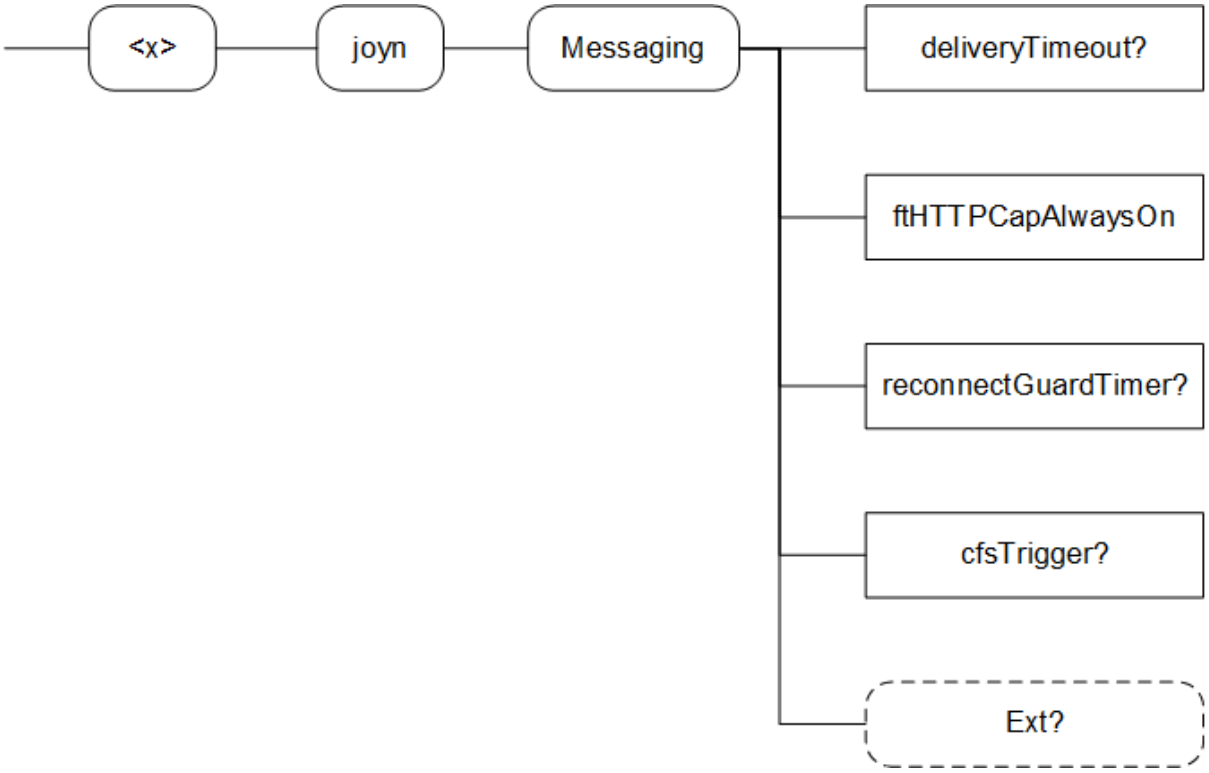

Figure 11: joyn Messaging MO tree

The associated HTTP configuration XML structure is presented in the table below:

```
<characteristic type="Messaging">
        <parm name="deliveryTimeout" value="X"/>
        <parm name="ftHTTPCapAlwaysOn" value="X"/>
        <parm name="reconnectGuardTimer" value="X"/>
        <parm name="cfsTrigger" value="X"/>
        <characteristic type="Ext"/>
</characteristic>
```

Table 16: joyn Messaging MO sub tree associated HTTP configuration XML structure

2.5.3.7 Technical Implementation of User Stories and Service Requirements

R5-23-1 Requirement R5-1-1 shall be supported as indicated in section 2.5.3. The entry point for sending a message shall be implemented locally on the device.

R5-23-2 Requirements R5-1-2, R5-1-3 and R5-1-4 shall be realised as defined in section 2.5.3.

R5-23-3 Requirements R5-1-4-1 and R5-1-4-2 and their subrequirements are implemented locally on the device based on the current connectivity state and the available information on the B-party as a consequence of the capability exchange (see section 2.3.3 and 2.5.3.3.1) and as specified in section 2.5.3.3.2.

R5-23-4 For requirement R5-1-4-3, the procedures for message revocation defined in section 3.3.4.1.10 of [RCS6.0] shall ensure that if a message is successfully revoked, it will not be delivered as a Chat message anymore whereas a network supporting interworking shall deliver the message either as a Chat message or as an SMS message. Message duplication is

thus avoided. For message revocation, while message duplication is avoided, message delivery after revoke can only take place via legacy cellular access. If the recipient connects via Wi-Fi, the message will not be delivered.

R5-23-5 For requirement R5-1-4-4, the full content of the message shall be delivered, either as a Chat message or as a concatenated SMS message.

R5-23-6 Requirements R5-1-4-5 and R5-1-4-6 shall be implemented locally on the device.

R5-23-7 Requirement R5-1-5 shall be realised based on the interworking procedures in [RCS6.0] and the applicable specifications it refers to.

R5-23-8 Requirement R5-1-5-1 shall be realised through the procedures in section 2.5.3.3.3.

R5-23-9 Requirement R5-1-6 shall be realised through the revocation procedures defined in section 3.3.4.1.10 of [RCS6.0] and the additional clarifications of section 2.5.3.5.

R5-23-10 Requirement R5-1-6-1 shall be realised based on the client configuration parameter CHAT REVOKE TIMER defined in [RCS6.0] and the network indication for the support of revocation as specified in section 2.5.3.2.

R5-23-11 Requirement R5-1-6-2 shall be implemented locally on the device.

R5-23-12 Requirement R5-1-6-3 shall be implemented locally on the device based on the value configured for the client configuration parameter CHAT REVOKE TIMER defined in A.1.4.3 of [RCS6.0].

R5-23-13 Requirement R5-1-6-4 and its subrequirements shall be implemented locally on the device with the default for the user setting being configured through the MESSAGING FALLBACK DEFAULT client configuration parameter defined in section 2.5.3.6.

R5-23-14 Requirement R5-1-6-5 and its subrequirements shall be implemented on the device using the revocation procedures defined in section 3.3.4.1.10 of [RCS6.0] with the timeout on regaining connectivity required in requirement R5-1-6-5-2 being controlled through the RECONNECT GUARD TIMER parameter defined in section 2.5.3.6. For sending the SMS in parallel with the Message Revoke requests required in requirement R5-1-6-5-4, the CFS TRIGGER parameter defined in section 2.5.3.6 shall be configured accordingly.

R5-23-15 Requirement R5-1-6-6 shall be implemented locally on the device

R5-23-16 Requirement R5-1-7 and its subrequirements shall be implemented locally on the device.

R5-23-17 Requirements R5-1-8, R5-1-9 and R5-1-10 shall be implemented locally on the device.

R5-23-18 For the message transfer states of requirement R5-2-1 the following technical implementation applies:

- **Pending**: When the user presses the button to send the message until the first success response is received from the network. For chat message, it may be in this state for some time when the user is not registered with the IMS core (e.g. offline or airplane mode). For SMS, it may be in this state when the user is not available for receiving SMS.

- **Sent**: For chat message, a first SIP provisional response is received from the network if the message is sent as part of the SIP INVITE or a MSRP 200 OK is received in case the message was sent over MSRP. For SMS, the message is successfully submitted to the network.
- **Delivered**: For chat message, when receiving the Delivery Notification with status set to “delivered”. Requirement R5-2-1-3-1 is realised based on the procedures described in [3GPP TS 23.040] upon receiving a delivery report of the short message. Requirement R5-2-1-3-2 shall be realised based on the Interworking disposition notification as specified in section 2.5.3.3.5.

NOTE: An originating client may receive for a chat message both a delivery and an interworking disposition notification, e.g. due to support of multi device in the terminating network. Reception of the delivery disposition notification overwrites the "interworking" status of the message".

- **Displayed**: For chat message, when receiving the Displayed Notification with the status set to “displayed”. Requirement R5-2-1-4-1 shall be implemented locally on the device. Requirement R5-2-1-4-2 shall be realised based on the Interworking disposition notification as specified in section 2.5.3.3.5. Displayed status is not applicable if the client received an interworking notification but no delivered notification.
- **Error**: For chat message, when an error different from 486/487 is received.

NOTE 1: Receipt of a 486/487 doesn’t change the status of the message

NOTE 2: In addition to the definitions, an error status is met if no Delivery notification has been received for a message after the time indicated by the DELIVERY TIMEOUT value, as defined in section 2.4.3.2 of this document.

R5-23-19 Notifications on delivery status information as defined in R5-2-2 shall be stored and forwarded in the Store and Forward server as specified in section 3.3.4.1.5 of [RCC.07].

R5-23-20 Requirements R5-2-3 and R5-2-4 shall be implemented locally on the device.

R5-23-21 For the requirements in user story US5-3 the device shall support the encoding and display of the graphical elements as defined in the referred Annexes.

R5-23-22 The requirements in user story US5-4 shall be implemented locally on the device.

R5-23-23 The indication that the other party is typing in requirement R5-5-1 is derived from the reception of the "isComposing" indication as defined in section 3.3.4.1 of [RCC.07]. It should be noted that the "isComposing" indication can only be transferred if an active chat session exist. Clients shall send the "isComposing" indication only if a chat session exists for the conversation the user is typing in.

R5-23-24 Requirement R5-6-1 shall be implemented as defined in section 2.4.3.

R5-23-25 Requirement R5-6-2 is fulfilled based on sections 2.5.3.1 to 2.5.3.6.

R5-23-26 Requirement R5-6-2-1 shall be implemented as defined in sections 3.3.4.1.4 and 3.3.4.1.5 of [RCC.07].

R5-23-27 Requirement R5-7-1 shall be implemented as defined in section 3.3.4 of [RCC.07].

R5-23-28 Requirement R5-7-2 shall be implemented locally on the device.

R5-23-29 As a clarification for R5-8-1, it shall be noted that the client shall not apply any procedures for the acceptance of the delivery of single messages. If the first message is carried in a SIP INVITE then the client should enforce the chat session auto accept policy of the Service Provider as defined via the configuration parameters IM SESSION START and SESSION AUTO ACCEPT defined in section A.1.3.3 of [RCC.07]. In all other cases the device shall rely on the value of the SESSION AUTO ACCEPT parameter which needs to be set by the Service Provider to 1 to enforce the client to accept the session immediately.

R5-23-30 The store-and-forward functionality defined in user story US5-9 shall be implemented as defined in sections 3.3.4.1.4 and 3.3.4.1.5 of [RCC.07].

R5-23-31 The requirements of user stories US5-10 and US5-11 shall be implemented locally on the device.

R5-23-32 For the requirements in user story US5-12 the client shall support the following procedure:

- It is the responsibility of the Messaging Server to deliver messages in the correct order, so the client can rely on it when sorting messages. The client shall interleave the sent and received messages in the chronological order.

R5-23-33 The requirements of user story US5-13 shall be implemented locally on the device.

R5-23-34 The requirements of user story US5-14 shall be implemented locally on the device.

R5-23-35 The requirements of user story US5-15 shall be implemented locally on the device. The user alias for addresses which do not match a contact in the contact list shall be implemented as defined in section 2.5.3.3 of [RCC.07].

R5-23-36 For the realization of requirements of user story US5-16 the client shall enforce the max message size for sending messages as defined by the configuration parameter MAX SIZE 1-to-1 IM defined in section A.1.3.3 of [RCC.07].

R5-23-37 For requirements R5-17-1 and R5-17-2 section 2.7.3 applies. For the interactions with the 1-to-1 Chat message service the requirements of section 3.5.2 of [RCC.07] apply.

R5-23-38 Requirement R5-17-3 shall be implemented locally on the device.

R5-23-39 The requirements of user stories US5-18 through to US5-22 shall be implemented locally on the device.

2.5.3.8 Backward Compatibility

Blackbird and CPR networks will not provide the parameters CHAT REVOKE TIMER, MESSAGING FALLBACK DEFAULT, RECONNECT GUARD TIMER and CFS TRIGGER in the configuration document. Having the parameters not present, the default values apply.

2.6 Group Chat

2.6.1 Description

Group Chat allows users to exchange chat messages with a number of contacts at the same time. Specific Group Chat features ensure proper handling of Group Chat – opposed to multiple one-to-one chat message distribution.

Major changes of the RCS Pre-Universal profile PDD compared to the Crane V3.0 PDD are:

- Removal of Closed Group Chat for participation
- Update of maximum number of Group Chat participants
- Specific refinements of Group Chat creation requirements

2.6.2 User Stories and Feature Requirements

US6-1 **As a user, I want to create a Group Chat Conversation with a selection of my contacts.**

R6-1-1 Any RCS user shall be able to create a Group Chat conversation by selecting capable (for this service) contacts from the contact list and invite them to a Group Chat.

R6-1-2 It shall be possible to create a Group Chat conversation by adding a (for this service capable) participant to a 1-to-1 Chat conversation. The existing 1-to-1 Chat conversation remains in the Chat conversation list, and a new Group Chat is created.

R6-1-3 Any (for this service capable) RCS user shall be able to participate in a Group Chat conversation when invited after the invite to that Group Chat has been confirmed (by automatic confirmation or manual confirmation).

R6-1-4 The Operator shall be able to set a maximum number of participants in a Group Chat conversation. To ensure interoperability, the operator shall allow 50 participants for each Group Chat conversation.

R6-1-5 It shall only be possible to set up a new Group Chat conversation if the initiating user is connected to the RCS platform.

R6-1-6 When starting a new Group Chat, the inviting user or initiator shall invite at least two other participants. The button to confirm the creation of the Group Chat shall be greyed out or unavailable until this condition is met. The restriction of at least three participants in a Group Chat shall only apply to the creation of a Group Chat, i.e. a Group Chat containing only two participants is perfectly valid if previous Group Chat participants have left or other invited participants had never joined.

R6-1-7 When a user tries to create a new Group Chat with the same list of participants and the same Group Chat subject title as an existing one, then the user shall be informed that a similar Group Chat exists and shall be asked whether he would like to create a new Group Chat or reopen the existing one.

R6-1-8 When a user tries to create a new Group Chat with the same list of participants as an existing one but not with the same Group Chat subject title, then a new Group Chat shall be created without prompting the user first.

US6-2 **As a user, I want to add a subject title and Group Chat Picture to any Group Chat Conversation.**

R6-2-1 When creating a Group Chat conversation it shall be possible for the initiator to define a subject title and a Group Chat icon.

R6-2-2 If no subject title has been defined, the application shall automatically generate a subject title (e.g. list of users on the Group Chat "Liz, Thomas plus 3 others").

R6-2-3 It shall be possible to maintain more than one Group Chat with identical Group Chat subject titles.

R6-2-4 Any Group Chat participant shall be able to change the subject of the Group Chat and / or Group Chat icon at any time. The change shall be visible on the device where the change was made only and is not shared with other participants of the Group Chat.

US6-3 **As a user, I want to add a contact from my contact list to an existing Group Chat conversation.**

R6-3-1 Participants in a Group Chat conversation shall be able to add new participants from their contact list.

R6-3-2 It shall be visible to the user what the maximum allowed number of participants in the Group Chat is.

R6-3-3 It shall not be possible to add new Group Chat participants in a Group Chat conversation once the maximum number of participants has been reached as configured by the Operator.

R6-3-4 It shall be possible to add participants to a Group Chat if they are "offline" at the time where the addition takes place.

NOTE: These participants are known to be RCS enabled but not registered to RCS service at the time of addition.

R6-3-4-1 It shall not be possible to add legacy non-RCS contacts to a Group Chat.

R6-3-5 Other Group Chat participants shall see the new participant- irrespective of whether the new participant is online or offline- from the time the new participants are accepted (either by automatic confirmation or manual confirmation of the user when online).

US6-4 **As a user, I want to know who is participating in a Group Chat conversation at any point in time.**
As a user, I want the contact names of Group Chat participants to be aligned with the according contact card (i.e. if a contact I am in a Group Chat conversation with is in my contact list, the identifying MSISDN shall be replaced with the name from the contact card).

R6-4-1 Any participant in a Group Chat conversation shall be able to see a list of participants at any point in time.

R6-4-2 If the sender of a Group Chat message is a stored contact in the recipient's address book, the MSISDN shall be replaced with the sender's name on the contact list in any representations where the message sender is represented.

R6-4-3 If the sender of a Group Chat message is not a stored contact in the recipient's address book, the RCS Alias name, if available, shall be presented in addition to the participant's MSISDN.

R6-4-4 If the Alias is being used to represent the sender's identity, the device UI shall use appropriate means to indicate that the Alias name is unverified information.

NOTE: The Alias as specified in RCS is created by the message sender and could be set to any possible name, the real name of the person, or a nickname or in extreme cases – in an attempt of identity spoofing – the sender could try to pretend a false identity.

R6-4-5 If neither the contact name nor the RCS Alias is available, a participating contact shall be represented with their MSISDN in the list of Group Chat participants.

R6-4-6 If new Group Chat participants join the Group Chat, all other Group Chat participants shall be notified with graphical elements inside the Group Chat conversation only.

R6-4-7 If Group Chat participants leave the conversation, all other Group Chat participants shall be notified with graphical elements inside the Group Chat conversation only.

US6-5 **As a user, I don't want to deal with Group Chat invites and acceptances, I want to join a Group Chat conversation whenever I am invited to participate.**

R6-5-1 Any user who was invited to a Group Chat conversation shall automatically become a participant of that Group Chat conversation no invite / acceptance 'handshake processes required.

R6-5-2 The user shall be able to see who originally set up the Group Chat.

NOTE: If the Group Chat is (technically) re-started, then the originator of the initial Group Chat set-up will still be visible (no change proposed).

US6-6 **As a user, I want to send text Group Chat messages to an existing Group Chat conversation.**

R6-6-1 Any participant in a Group Chat conversation shall be able to send messages to all Group Chat participants.

R6-6-2 If the originating user tries to send messages to other Group Chat participants while "offline", the messages shall be queued locally on the device and sent out once the device is "online" again.

US6-7 **As a user, I can send a Group Chat message to an existing Group Chat conversation like a text and it is just delivered. Recipients do not need to explicitly accept any single message.**

R6-7-1 Any message exchanged in the Group Chat conversation shall be received on other participants' devices without any form of acceptance of the message.

US6-8 **As a user, I want to send text Chat messages to my Group Chat participants even when they're temporarily offline (e.g. device switched off). I expect participants to receive these Chat messages when they come online again.**

R6-8-1 If any participant in a Group Chat conversation is currently "offline", any message(s) or update(s) to the list of Group Chat participants shall be delivered once the user is back "online".

R6-8-2 The Operator shall be able to set the storage duration for Store and Forward cases (deferred messaging) based on individual Operator parameters.

NOTE: The parameters may be aligned on local level as the terminating network storage time has an impact on the sending network's user experience.

US6-9 **As a user, I want to include smileys in my Chat messages.**

R6-9-1 It shall be possible to add Emoji when creating a Chat message by adding from a selection of graphical elements in the chat application.

NOTE: Standards for conversion of text strings to Emoji are described in the Annex 'Emoticon conversion table' see Annex A.2.

R6-9-2 It shall be possible to add the basic Emoticons when creating a Chat message by typing in the respective text string, separated by blank spaces (e.g. ";-) "converts to "☺") or typing in the respective text string without blank spaces if the string is the only characters of the message content.

NOTE: The basic set of Emoticons is listed in the Annex 'Emoticon conversion table', see Annex A.2.

R6-9-3 Emoji shall be interpreted as detailed in the conversion table in the Annex of this document. The graphical elements that are used may vary between implementations, but the conveyed meaning must not be changed.

R6-9-4 Emoticons from the basic set of Emoticons, which are received in Chat messages, shall be converted to graphics, if they were separated by blank spaces in messages (e.g. ";-)" converts to "☺") or without the blank spaces if the emoticon string is the only characters of the message content.
NOTE: The conversion of text strings to graphics for any type of smileys shall affect any representation of the messages on the user interface, that includes the conversation thread as well as any notifications or previews of messages in pop-ups or dedicated screens.

US6-10 **As a user, I don't want to feel restricted by Group Chat message size limits.**

R6-10-1 Group Chat messages (incoming and outgoing) shall allow to send and receive messages with up to 3000 characters.

NOTE: Operator defined parameter.

US6-11 **As a user, I want to see the status of my sent Group Chat messages.**

R6-11-1 For A-Party, the following message states shall be indicated to the user:

R6-11-1-1 Message Pending: Transfer of the Chat message in progress (e.g. queuing on device).

R6-11-1-2 Message Sent: Confirmation that the message has been correctly accepted by the A-Party's network.

R6-11-1-3 Message Delivered: Receiving devices have noticed that a message has been received by the device.

R6-11-1-4 Message Displayed: When the message has been displayed in the Chat view on the receiving device.

R6-11-1-5 Message send failed: The expected outcome of the operation could not be confirmed by the network (in this case: Message Sent or Message Delivered status notification has not been received) and the device does not attempt to send the message anymore).

NOTE: Sending the message may be re-triggered manually by the user.

R6-11-2 If the sending device is offline at the time a notification is received, notifications shall be stored on the network and forwarded once the sending device is online.

US6-12 **As a user, I want to see when the other party is currently writing a Group Chat message.**

R6-12-1 The other party shall be able to see an "[name from contact list or MSISDN] is typing" notification whenever a new Chat message is being created.

US6-13 **As a user, I want to be notified at any time my device receives a new Group Chat message.**

R6-13-1 On receiving a Group Chat message, the user shall be notified with graphical and sound elements (similar as the device notifies incoming SMS messages if not stated differently in this document).

R6-13-2 For audio notifications, device audio related settings shall prevail.

R6-13-3 Any audible or visual notification shall be suppressed in case the reception is visible on the currently active screen of the device (e.g. if the user is currently on the chat screen with a person and a File Transfer is received).

R6-13-4 If the device supports a notification LED (for screen-off notification) then this LED shall flash as long as there are unread RCS messages. The colour should differentiate from notifications of other applications, but may be identical for all Operator Messaging Services.

US6-14 **As a user, I want notifications of rapidly sequenced incoming Group Chat messages intelligibly aggregated and counted.**

R6-14-1 Rapid sequence of incoming Group Chat messages in one Group Chat conversation shall be consolidated into one audible notification per Group Chat conversation. Consolidation of visual notifications is not affected.

R6-14-2 On selection of the visual notification for a single new message or multiple messages from one Group Chat conversation, the user shall be directed to the respective Group Chat message.

R6-14-3 On selection of the visual notification for two or more new messages from different Group Chats, the user shall be forwarded to the list of (Group Chat) conversations. In this case, the unread message visual identifier shall be removed once the last new message was read. Alternatively, the OEM may handle it differently on the device (e.g. the visual notification disappears already after selecting the notification and seeing the list of Group Chat conversations).

R6-14-4 The visual notification shall be permanently removed after the user has opened the message.

US6-15 **As a user, I want to be able to mute individual Group Chat conversations which results in silencing any audible notification or vibration on incoming new Group Chat messages or notifications on joining / leaving participants from that specific Group Chat conversation.**

R6-15-1 The user shall be able to mute selected Group Chat conversations, i.e. no audio or vibrate notification shall be performed on incoming new messages within the selected Group Chat conversation.

NOTE: This selection does not have any effect on notifications in any other than the selected Group Chat conversation.

US6-16 **As a user, I want to see the subject title and group picture as the identifier of a Group Chat conversation in the list of Chat and Group Chat conversations.**

R6-16-1 Any Group Chat shall be represented with subject title and group picture (and possibly unread message identifier) in the list of Chat conversations.

US6-17 **As a user, I want conversations which contain unread messages to be differentiated from conversations that contain my read messages.**

R6-17-1 Group Chat conversations shall elevate to the top of the conversation list on reception of a new message

NOTE: Unseen files or file download notifications cover events that use File Transfer as an enabler e.g. but not limited to, Audio Messaging or vCard share.

R6-17-2 Group Chat conversations with unread messages, unseen files or file download notifications shall be marked accordingly, e.g. by display of the subject line in bold font and / or an unread message counter.

US6-18 **As a user, I want to receive Group Chat messages from any of the contacts participating in a Group Chat conversation.**

R6-18-1 Any RCS user shall be able to receive Chat messages that are sent to Group Chat conversations.

NOTE: Group Chat participants who are blacklisted on the user's device are treated separately.

R6-18-2 Group Chat messages shall be received straight in the inbox; no handshake acceptance shall be required.

R6-18-3 Any participant of a Group Chat shall only be able to see messages that have been exchanged between the time the Group Chat was accepted and the time when they choose to leave the Group Chat.

NOTE 1: Group Chat participants who are blacklisted on the user's device are treated separately.

NOTE 2: Technically, the new member is part of the Group Chat once the invite was accepted. This may in many installations happen by automatic acceptance by the Group Chat server.

R6-18-4 It shall not be possible for any participant of a Group Chat conversation to see any messages that have been exchanged before the participant has joined the Group Chat.

US6-19 **As a user, I want to exchange multi-media content (e.g. but not limited to: take an instant picture from camera and send from within the chat) in my Group Chat conversations.**

NOTE: Details on multi-media content are covered by File Transfer incl. Geolocation Push, see section 2.7.

R6-19-1 The user shall be able to select and send multi-media elements in Group Chat conversations.

R6-19-2 The user shall be able to receive multi-media elements in Group Chat conversations.

R6-19-3 The user shall be able to browse any media that was exchanged in the particular Group Chat in an aggregated view.

US6-20 **As a user, I want to view my sent and received Group Chat messages in a time-based order.**

R6-20-1 All messages exchanged within the same Group Chat conversation shall be threaded in the same group chat thread in timely order.

R6-20-2 The order of messages shall be in line with the order of messages that have been sent and received on the device.

R6-20-3 Incoming and outgoing messages shall be displayed interlaced.

R6-20-4 Outgoing messages shall be inserted into the Group Chat Conversation thread as they have been sent.

US6-21 **As a user, I want to see the timestamp associated with each of my sent and received messages.**

R6-21-1 The date and time associated with each chat message shall be displayed adjusted to the current device date and time.

R6-21-2 This timestamp shall be generated for sent messages by the device in a consistent way as timestamps are generated for other device functions, e.g. SMS.

R6-21-3 Timestamps for received messages shall be based on the UTC timestamp that comes with each message, aligned with the selected device time zone.

US6-22 **As a user, I want all Group Chat conversations to permanently reside on my device, and I can resume that Group Chat whenever I decide to do so.**

R6-22-1 Any participant in a Group Chat conversation shall be able to send a Chat message to other participants in the Group Chat at any given point in time.

R6-22-2 If the chat application is closed either by manual user interaction (e.g. by selection of another RCS function, pressing the ‘home’ key or switch to another application) or device interaction (e.g. receiving call), the connection to the ongoing Group Chat shall be kept. In this case, the user shall stay in the group, continue to receive incoming new messages and resume at any point in time. The other participants shall not receive any notification about this procedure.

R6-22-3 A Group Chat expires in the network when there is no activity in it for a few minutes. However, when this happens, the device shall hide this network behaviour from the user and simulate the experience of a permanent Group Chat, showing the conversation in the Chat history and allowing any subsequent continuation. The following solution shall be implemented:

R6-22-3-1 Session related information is not shown to the user, i.e. ‘Chat closed’ shall not be displayed at the UI level.

R6-22-3-2 Sending a new message shall be enough to continue a Group Chat that has timed out at network level.

R6-22-3-3 When the user hits ‘Send’ the Group Chat session is set up and the user’s message is also sent.

R6-22-3-4 When a Group Chat is restarted, no notifications of users joining shall be displayed for participants that were already part of the local participant list. The Group Chat header shall show if any participant is unavailable and shall give access to details of participants.

R6-22-3-5 The Group Chat shall continue in the existing Chat window. The full history of the session shall be preserved.

R6-22-3-6 While the Chat is closed at network level, the 'Participants list' should still be expandable in order for the user to be able to see the recipients of their new message.

US6-23 **As a user, I want to maintain multiple Chat and Group Chat conversations in parallel.**

R6-23-1 Multiple parallel Chat and Group conversations shall be supported at any given point in time.

US6-24 **As a user, I want to easily and quickly switch between parallel Chat conversations.**

NOTE: These Chat Conversations may be One-to-One or Group Chat Conversations.

R6-24-1 The device shall allow the user to switch between parallel Chat and Group Chat conversations easily and quickly.

US6-25 **As a user, I want to be able to leave a Group Chat conversation at any point in time. After I have left a Group Chat conversation, the conversation thread is still visible in the list of my conversations, but I am neither able to send any messages to that Group nor do I receive any kind of updates from that Group.**

NOTE: Re-joining Group Chat conversation once left is only possible if the user is re-invited to that (open) Group Chat. Re-joining a closed Group Chat conversation is not possible.

R6-25-1 Any participant in a Group Chat conversation shall be able to leave at any point in time.

R6-25-2 Any participant who has left a Group Chat conversation shall no longer receive any new messages or updates to the participants list.

R6-25-3 After a Group Chat participant has left, the Group Chat conversation shall still be visible in the list of conversations (if not manually deleted), containing any messages or participant list updates for the period of participation of the user.

R6-25-4 It shall be possible for a user to re-join a Group Chat conversation which they explicitly left if they are re-invited by another participant who is still active in the Group Chat.

R6-25-5 After leaving a Group Chat, the user shall be informed that they will no longer receive any messages from that Group Chat, and that they have to ask an active Group Chat participant to re-invite if them if the user wants to re-join that Group Chat.

NOTE: This information shall be presented in a non-intrusive way to the user, and the user shall be able to select a "never show again" function.

R6-25-6 Manually deleting a Group conversation from the list of chat conversations automatically triggers leaving the Group Chat, i.e. the participant is removed from the list of Group Chat participants.

NOTE: A user warning may be given by the device that the deletion of a Group Chat removes the participant from the GC entirely.

R6-25-7 Deleting one, more or all messages within a Group Chat conversation (without removing the Group Chat conversation thread from the list of conversations) does not trigger leaving the Group Chat.

R6-25-8 Participants shall be automatically removed from the Group if the corresponding user account / subscription is no longer valid.

NOTE: Details of the subscription validity are at the discretion of the individual operator.

US6-26 **As a user, I want to use the text editing tools that are available on my device (e.g. but not limited to, copy paste, edit) for Chat messages.**

NOTE: In case of the user trying to paste an image into the text editor the device may ignore the user action.

R6-26-1 The user shall have the option to select text (e.g. from a message, a website or any other text source) and use text editing tools such as copy & paste to create messages.

US6-27 **As a user, I want to select and delete single and multiple chat messages in a Group Chat thread.**

R6-27-1 The user shall have the option to delete a single Chat message from a Group Chat conversation.

R6-27-2 The user should have the option to delete single and multiple Chat messages in from a Group Chat conversation.

US6-28 **As a user, I want to delete complete Group Chat conversations.**

R6-28-1 The user shall have the option to delete an entire Group Chat conversation. Deleting an entire Group Chat conversation shall automatically trigger leaving the Group Chat.

US6-29 **As a user, I want to be able to forward a single sent or received chat message or multimedia content to one or more contacts.**

NOTE: This may be performed by the user by copying existing message text and pasting into a new Chat message.

R6-29-1 The user shall have the option to forward a single sent or received Group Chat message or multimedia content to one or more contacts.

NOTE: This function may be executed using the copy and paste text editor function on the device.

US6-30 **As a user, I want to switch to a voice or video call with one of the Group Chat participants by selecting one person from the participants list and initiating the call.**

NOTE: During the voice or video call, the user may make use of the Group Chat application.

R6-30-1 The user shall have the option to easily access and make a voice call to one of the Group Chat participants. After the call has ended, the user interface should return to the Group Chat conversation.

R6-30-2 The user shall have the option to easily access and make a video call to one of the Group Chat participants. After the call has ended, the user interface should return to the Group Chat conversation.

US6-31 **As a user, I want to be able to answer any incoming voice or video call during a Group Chat conversation - and resume the Group Chat when the call is finished.**

NOTE: During the voice or video call, the user may make use of the Group Chat application.

R6-31-1 The user shall be able to receive a voice call when actively engaged in a Group Chat conversation and when the voice call ends, the user interface should return to the Group Chat conversation.

R6-31-2 The user shall be able to receive a video call when actively engaged in a Group Chat conversation and when the video call ends, the user interface should return to the Group Chat conversation.

2.6.3 Technical Information

2.6.3.1 Overview

The group chat service is provided as defined in section 6.3 of [RCC.60].

NOTE: Reference to [RCC.60] is provided due to the fact that group chat procedures have evolved from the ones in [RCC.07].

For Pre Universal profile networks the support of Full Store and Forward for Group Chat as defined in section 3.4.4 of [RCC.07] is mandatory.

2.6.3.2 Technical Implementation of User Stories and Service requirements

R6-32-1 For user story US6-1 the following definitions apply:

- The Group Chat service shall be offered to the user if the device configuration authorises the service via the CHAT AUTH and CONF-FCTY-URI parameters defined in section A.1.3 of [RCC.07].
- The procedures for initiation of a group chat and the conditions for the client to select capable contacts are defined in section 3.4.4 of [RCC.07]. As a clarification to the definitions in section 3.4.4 of [RCC.07], the Store and Forward Feature IARI tag is not used in Pre Universal profile networks. Therefore, clients shall not consider the capability associated with the IARI tag when offering the user to invite a contact. Consequently, there is no need for Pre Universal clients to advertise the Group Chat Store and Forward capability during discovery. The Service Provider is able to determine for the client which contacts are capable for a group chat, i.e. chat contacts only, or any contact including non RCS contacts.
- The operator serving a user can determine the maximum number of participants if a Group Chat is started by the user by means of the MAX_AD-HOC_GROUP_SIZE parameter defined in section A.1.3 of [RCC.07]. The operator hosting a Group Chat can determine the maximum number of participant by setting a policy for the [RFC5475] maximum-user-count. The client shall not allow the user to add participants if the maximum allowed number of participants is reached. The maximum allowed number of participants for a Group Chat is determined by the client as defined in sections 3.4.4.1.2 of [RCC.07].
- Requirement R6-1-6 for the restriction upon Group Chat creation shall be implemented locally on the device. The maintenance of Group chat with two participants shall be realized based on the minimum participants release policy in the Messaging Server. When one of the two remaining participants decides to leave the Group Chat

conversation the group chat will be closed according to the procedures in section 3.4.4.1.3.1 of [RCC.07].

- Requirements R6-1-7 and R6-1-8 shall be implemented locally on the device.

R6-32-2 The subject of a Group Chat conversation as defined in user story US6-2 is implemented in accordance with sections 3.4.4.1.1 and 3.4.4.1.2 of [RCC.07]. Requirements R6-2-1 to R6-2-4 shall be implemented locally on the device. For subsequent re-starts of the Group Chat and for the case that the subject has changed locally on the device, the original subject shall be included in the Subject header of the SIP INVITE request

R6-32-3 The client shall allow members of a Group Chat Conversation to add new participants as defined in section 3.4.4.1.2 of [RCC.07] to fulfil the requirements of user story US6-3. Requirement R6-3-5 shall be implemented locally on the device based on the received notification and the indicated participant status.

NOTE 1: To avoid sending notifications to participants twice in short succession, the conference focus shall briefly delay notifying the existing participants of the "pending" state of the newly added participant to allow for automatic acceptance of the Chat (e.g. because of Store and Forward). In that case the participant's state will change to "active" almost immediately.

NOTE 2: The client shall not allow the user to add participants if the maximum allowed number of participants is reached. The maximum allowed number of participants for a Group Chat is determined as defined in sections 3.4.4.1.2 and 3.4.4.1.7 of [RCC.07].

R6-32-4 In order to be able to display the list and status of users in a group conversation as required in user story US6-4 each client shall subscribe to the conference event package as defined in section 3.4.4.1.1 of [RCC.07]. The client will be informed by the Messaging Server about the list of participants and their status based on this subscription.

The user alias for Group Chat users described in requirements R6-4-3 and R6-4-4 is implemented as defined in section 2.5.3.3 of [RCC.07].

R6-32-5 The client implementation shall ensure that the invitation to a Group Chat does not require explicit user input to accept it as required in user story US6-5. Service Providers shall enforce auto accept for an invitation to a Group Chat by setting the value of the configuration parameter IM SESSION AUTO ACCEPT GROUP CHAT as defined in section A.1.3.3 of [RCC.07].

R6-32-6 For the requirements of user story US6-6, in order to send text to a conversation while a Group Chat exists the client shall send the message using this session. If no session exists, the client shall restart the Group Chat as defined in section 3.4.4.1.7 of [RCC.07] and send the message to it.

R6-32-7 The client shall not implement client UI procedures to accept reception of messages or group chat invitations to fulfil the requirements of user story US6-7.

R6-32-8 The requirements of user story US6-8 is fulfilled by means of the Group Chat Store and Forward functionality described in section 3.4.4.4 of [RCC.07].

R6-32-9 The implementation of the smileys and Emoji in the requirements of US6-9 shall be supported as defined in Annex A.2 and A.3.

R6-32-10 For the realization of the requirements in user story US6-10 the client shall enforce the max message size for sending messages as defined by the configuration parameter MAX SIZE GROUP IM defined in section A.1.4.3. of [RCC.07]. It is required for Service Providers to set the value as indicated in Annex B.

R6-32-11 For the realisation of the requirements in user story US6-11, the status indication for group chat messages and File Transfer sent in the group chat are the same as defined for chat messages in section 2.5 and for files in section 2.7. Requirement R6-11-1-4 shall be realised based on section 3.4.4.1.5 of [RCC.07] when receiving the Display Notification with the status set to "displayed".

R6-32-12 Notifications on delivery status information as defined in R6-11-2 shall be stored and forwarded in the Messaging Server as specified in section 3.4.4.4 of [RCC.07].

R6-32-13 The requirements for US6-12 to display typing notifications is implemented same as for 1-to-1 Chat as defined in section 3.4.4. of [RCC.07].

R6-32-14 The requirements for user stories US6-13 through to US6-17 shall be implemented locally on the device.

R6-32-15 The requirements for user story US6-18 shall be implemented locally on the device. For acceptance of Group Chat sessions, the client shall apply the behaviour as defined by the configuration parameters IM SESSION AUTO ACCEPT GROUP CHAT with the value defined in Annex B. The client shall not apply any UI procedures for the acceptance of the delivery of single messages.

R6-32-16 Sending of Multimedia in a Group Chat, as defined in the requirements of US6-19 shall be done as defined in section 2.7. Requirements R6-19-1 and R6-19-2 shall be implemented based on the procedures described in section 2.7.3 the ability to select multi-media elements in Group Chat conversation shall be implemented locally on the device. Requirements R6-19-3 shall be implemented locally on the device.

R6-32-17 For the requirements in user story US6-20 the client shall support the following procedures:

- It is the responsibility of the Messaging Server to deliver messages in the correct order, so the client can rely on it when sorting messages. The client shall interleave the sent and received messages in the chronological order.

R6-32-18 The requirements of user story US6-21 shall be implemented locally on the device.

R6-32-19 The requirements of user story US6-22 shall be implemented locally on the device based on the Group Chat life cycle definitions in section 3.4.4 of [RCC.07].

R6-32-20 The requirements of user stories US6-23 and US6-24 shall be implemented locally on the device.

R6-32-21 The requirements of user story US6-25 shall be implemented as defined in section 3.4.4.1.3.1 of [RCC.07]. If the user wants to leave a group chat while it is inactive, the client shall restart the Group Chat first, as defined in section 6.3.3.1 of [RCC.60].

Subsequent invitations to a Group Chat the user has voluntarily left shall be accepted by the client.

R6-32-22 The client implementation shall ensure that the Group Chat handling as defined in R6-25-6 initiates a request to the network to voluntarily leave the group chat.

R6-32-23 The requirement for automatic removal from the Group Chat defined in R6-25-8 shall be implemented as described in section 3.4.4.1.3.1 of [RCS6.0].

R6-32-24 The requirements of user stories US6-26 through to US6-31 shall be implemented locally on the device.

2.6.3.3 Backward Compatibility

Blackbird and CPR networks will provide the parameter GROUP CHAT AUTH in the configuration document. If the parameter is present the client shall ignore it.

2.6.3.3.1 Clients without File Transfer over HTTP support within Group Chat

NOTE: This section is relevant for interoperability of this profile with other profiles without File Transfer over HTTP support.

If a HTTP File Transfer is initiated and one or more of the parties in the Group Chat do not support receiving it (i.e. did not provide the application/vnd.gsma.rcs-ft-http+xml MIME content type in the a=accept-wrapped-types attribute in the SDP that it provided during the Group Chat session set up), the conference focus shall compose a plain text message to those participants explaining that a file was sent to the participants in the chat that cannot be retrieved automatically by the client. That message shall also provide the link to the file to allow retrieving the file manually through the browser.

When receiving the MSRP 200 OK response on the MSRP SEND request used to relay this message, the Messaging Server shall send a positive Delivery Notification to the sender in case such a notification was requested.

2.7 File Transfer incl. Geolocation Push

2.7.1 Description

File Transfer enables transferring files from one RCS device to one or more RCS devices. The main service entry points will be the Chat and Group Chat applications on the device, but there shall be other service entry points as well. This Product Definition Document describes the User Stories, Service Requirements and technical implementation details for the core File Transfer service and all features around the core.

Geolocation Push allows a user to share their current position or selected location with one or more RCS contacts.

Major changes of the RCS Pre-Universal profile PDD compared to the Crane V3.0 PDD are:

- Enhanced procedures for File Transfer delivery to support possible fallback to SMS (Delivery Assurance).
- Support for sending SMS with link to file to non-RCS users

2.7.2 User Stories and Feature Requirements

US7-1 **Pre-Universal clients shall be able to send files to clients on Pre-Universal networks or clients which are on a Blackbird or Crane Priority Release (CPR) network.**

R7-1-1 If the required networks and clients support Delivery Assurance (CFS or NFS), then the procedures to determine the File Transfer Service (File Transfer, File Transfer link via SMS or MMS) as described below (R7-2-2 and sub-requirements) shall apply. Requirements and procedures described in chapter 2.4 (Operator Messaging) are not relevant in this case.

R7-1-2 If the capability of Delivery Assurance (CFS or NFS) is not indicated as available to the originating client, the procedures to determine the File Transfer Service as described in chapter 2.4 “Operator Messaging” shall be applied as configured by the operator.

US7-2 **As a user, I want to ensure that my files reach their destination as reliably and quickly as possible.**

R7-2-1 If File Transfer cannot be instantly delivered by RCS, the B-Party network should apply Delivery Assurance.

R7-2-1-1 The B-Party network shall notify the A-Party network and client that the file delivery is ensured by the B-party network.

R7-2-2 The user shall have the option to manually select “notify user by SMS” at any time after successful upload of the file and before the file notification has been confirmed delivered or the operator configurable period of time expired (a revoke of the original File Transfer notification shall be triggered).If the A-Party client is made aware that “CFS” is available and a file is not confirmed to be delivered within an operator configurable period of time via RCS File Transfer, the A-Party user (who is registered on RCS) shall be informed and have the opportunity to notify the recipient with a download link based on SMS.

R7-2-2-1 The user shall have the option to automate the user interaction for Client Fallback to SMS link.
The following options shall be selectable:
- Always ask
- Never ask and always send as SMS link
- Never ask and never send as SMS link

R7-2-2-1-1 The user shall have the option to view and/ or change this decision at any point in the RCS settings section.

NOTE: Steps 3 (R7-2-2-2-3 below) to Step 5 (R7-2-2-2-5 below) are only presented to the user if the device is configured to “Always Ask” and would be automatically processed accordingly if the device is configured to “Never Ask and always send as SMS”.

R7-2-2-2 Details of how and when the revocation of the RCS link and “Send as SMS link” procedure shall be applied:

R7-2-2-2-1 Step 1: User A has created a File Transfer and the file has been sent.

R7-2-2-2-2 Step 2: Delivery for that File Transfer has not yet been confirmed within an operator configurable period of time. If the A-Party device should have been offline during this period, the following Step 3 shall not be triggered unless the A-Party device was ‘online’ for an operator configurable time after reconnection, to allow update of File Transfer status notifications.

R7-2-2-2-3 Step 3: The user is presented with a message “Your File Transfer has been successfully uploaded, but the notification for the recipient could not be delivered instantly. Do you want to change to an SMS notification?” and a confirmation request for the user to select (yes / no) input.

- If during the display of that message, before user confirmation, a delivery notification for that File Transfer comes in, the user request for “Send as SMS link” shall be removed, and the original File Transfer shall be indicated ‘delivered’ (or ‘downloaded’, if applicable).
- The user may have the option to remember this selection for future instances of this "Revocation and send as SMS link" procedure. If the user has selected this, the selection shall be remembered in the user setting (R16-16-1). The user shall always have the option to undo this selection by changing the setting back to “Always ask”.

R7-2-2-2-4 Step 4a: If the user selects “Yes”, then

- a revocation for the original download link notification shall be triggered,
- the original File Transfer (thumbnail element) shall be removed from the conversation history once the revocation has been confirmed successful,
- a parallel SMS link shall be sent in the background.
- A second File Transfer is generated in the A-party client as a thumbnail of the original File (consistent behaviour compared to Chat / SMS experience), with the sending service indication “SMS”.
- If the user has sent more than one File or message, then the decision to send as SMS (link) shall apply to all events in ‘sent’ or ‘pending’ status.
- Failure of one of these steps, shall not mean that the other steps shouldn’t be executed. This may lead to duplicated File Transfer access messages on the recipient’s device.

- File Transfer latching shall be applied (as described in R7-2-2-3).

R7-2-2-2-5 Step 4b: If the user selects “No”, a revocation of the original download link notification shall not be triggered, neither an SMS link shall be sent.

- The File Transfer status is updated according to the delivery status.
- The RCS File Transfer notification to the recipient user will stay in the store & forward of the terminating network (according to terminating operator policies).
- The user shall not be asked again to notify this file transfer by SMS.

R7-2-2-3 File Transfer Latching:
When sending a File to a known CFS enabled contact, a Pre-Universal client shall by default propose to use FT. If during the last FT exchange the client has applied CFS (SMS link) and there has been no indication since that the contact is online again (e.g. capability exchange or use of another RCS service), SMS link shall be used as the default sending service.

R7-2-2-4 SMS link shall also apply if the client has already fallen back to SMS for text messaging: subsequent File transfers shall continue to be sent as SMS or SMS link until RCS availability is confirmed (e.g. capability exchange or use of another RCS service).

US7-3 **As a user, I want to transfer files to contacts and receive files from other RCS users.**
As a user, I want to transfer and receive a file of any file format.

NOTE: Any file format can be selected and transferred, irrespective of the receiving device capabilities of representing the content in an appropriate way.

R7-3-1 If the originating device is not connected to RCS, File Transfer cannot be sent from the device.

R7-3-1-1 The device implementation may allow the user to create an RCS File Transfer in that case.

R7-3-1-2 The File Transfer status is ‘pending’ and the A-Party user is informed about this status.

R7-3-1-3 The File Transfer shall be executed once the originating device is registered to RCS again without further user interaction.

R7-3-2 Any RCS user shall be able to transfer a file to Contacts in their contact list or by entering the contact’s MSISDN.

R7-3-3 File Transfer shall allow the transfer of any file from a sending device to one or more recipients.

R7-3-4 File Transfer shall be capable of transferring exactly one file at a time.

NOTE: The user interface of a device may want to allow multiple selection of files for File Transfer and then process these files as separate File Transfer jobs.

R7-3-5 The following file types per content type shall be supported by any RCS device in the way that content can be generated or displayed / replayed:

R7-3-5-1 Pictures in JPEG format shall be supported.

R7-3-5-2 Audio files in MP3 format shall be supported.

R7-3-5-3 Video Files in MPEG4 format shall be supported.

R7-3-5-4 vCards in .vcf format shall be supported (for details see R7-14-2)

R7-3-6 Any RCS device shall have the liberty to support (generation / replay) other formats in addition to the formats listed in R7-3-5 ff.

R7-3-7 If the recipient is not RCS capable, but the originating device is connected to RCS, the originating device shall use one of the operator configurable options below:

R7-3-7-1 File Transfer legacy support:

R7-3-7-1-1 The legacy support shall upload the file and create an SMS containing the link that allows to download the file for the recipient with minimal user interaction. This link shall be accompanied by a 'cover note' in local language that conveys the following message: "You have received a file that originates from the sender as indicated. If you wish to download the file, please click the link:"

R7-3-7-1-2 For the case of legacy support to recipients not RCS capable, the network shall generate a "short link" that allows the user to identify the sender as their operator which is a trusted party. (If technically required, it might be the originating network identifier as well).

R7-3-7-2 MMS

NOTE: In no case there should be an attempt to send RCS to non-RCS users and wait for the fail result.

US7-4 **As a user, I want to transfer a file from multiple service entry points on my device.**

R7-4-1 There shall be a number of service entry points to File Transfer, including, but not limited to, 1-to-1 Chat, Group Chat, Contact Card, and Gallery.

US7-5 **As a user, I want to see the status of any file I sent (including those which have not been delivered (yet)).**

R7-5-1 File Transfer shall support delivery status notifications per individual file (sender device):

R7-5-1-1 File Transfer Pending: waiting to transfer the file to the network (e.g. queuing on device).

R7-5-1-2 File Transfer in progress: file transfer started but not completed.

R7-5-1-3 Cancelled: the sender has cancelled the File Transfer during the File Transfer process.

R7-5-1-4 File delivered: transmission of the File Transfer request has been successfully completed to the receiving network.

R7-5-1-4-1 The A-Party user shall be able to understand whether or not to expect a Download Notification for a sent File Transfer or other restrictions that are caused by Delivery Assurance application.

R7-5-1-5 File downloaded: reception of the full file on the receiving device is complete.

R7-5-1-5-1 If a “Download” notification is not available for legacy support and Delivery Assurance cases, the originating client shall be made aware and the user shall be made aware of the reduced feature set of legacy support, similar to missing “Display” notification in 1-to-1 Chat.

R7-5-1-6 File Transfer failed: the expected outcome of the operation could not be confirmed by the network.

NOTE: In this case, File Downloaded or File Delivered status notification has not been received and the device does not attempt to transfer the file anymore. The failed File Transfer event may be re-triggered manually by the sender.

R7-5-2 If the sending device is offline at the time a notification is received, notifications shall be stored on the network and forwarded once the sending device is online

US7-6 **As a user, I want the option to resize pictures before transferring the file, in order to limit the transfer volume, the amount of memory space needed and the transfer time.**

NOTE: “resize” means changing the picture size to either a high, medium and low size of the picture.

R7-6-1 Selecting a picture file format that can be rendered by the sending device shall offer the user the option to resize the picture to smaller file size in order to save memory, network load and transfer time. “Resize” means changing the picture resolution.

NOTE: In most cases, users are aware of the use of the picture on receiver side, for instance whether it shall be displayed on small screens only, or whether it may be printed on large scale. This feature provides the user with an option to adopt to these cases.

US7-7 **As a user, I want the option to resize videos before transferring the file, in order to limit the transfer volume, the amount of memory space needed and the time to transfer the file.**

NOTE: “resize” means changing the resolution to either a high, medium and low format

R7-7-1 The default resizing option proposed shall be 480p at 1200kbps.

R7-7-2 On selecting a video file, the user shall have the option to resize the video resolution to a smaller file size in order to save memory, network load and transfer time. The user shall see what the file size would be after that resizing option is applied.

R7-7-3 When a video is recorded with the specific purpose of sending using File Transfer, the video shall be recorded in 480p at 1200 kbps resolution.

US7-8 **As a user, I don’t want to perceive a restriction in file sizes that I want to transfer.**

R7-8-1 The Service Provider shall set the File Transfer limit to 50 MB.

R7-8-2 The Service Provider shall be able to configure a warning threshold value. When a user attempts to transfer a file larger than this value, auto-acceptance is not possible.

US7-9 **As a user, I want to transfer a file to multiple users at a time within a Group Chat.**

R7-9-1 File Transfer within a Group Chat shall transfer the file to all participants of the Group Chat.

R7-9-2 The ability to send files shall be available independent of whether the Operator supports legacy Group Chat or not.

NOTE 1: Any adaption from standard Group Chat File Transfer for legacy (non-RCS) contacts is executed on the network level).

NOTE 2: The sender side shall only send the file once over the network in this case.

US7-10 **As a user, I want to transfer a file to multiple users at one time from the gallery or a file browser.**

R7-10-1 The Operator Messaging Service selection shall be made based on capabilities of the participants and cannot be determined before the participants are selected.

R7-10-2 If the user selection of recipients does include one or more contacts not known to be RCS capable and the operator does not support RCS Group Chat legacy support, the file shall be delivered based on operator configuration:

R7-10-2-1 The file shall be uploaded to the RCS File Transfer server and a download link shall be distributed by SMS,

R7-10-2-1-1 The File Transfer is carried out as a multiple 1-to-1 File Transfers.

R7-10-2-1-2 The File Transfer is visible in existing or to be set up 1-to-1 Chat conversations with each recipient.

R7-10-2-1-3 The network shall generate a “short link” that allows the user to identify the operator that provides the download link as a trusted source. This link shall be accompanied by a ‘cover note’ in local language that conveys the following message: “You have received a file that originates from the sender as indicated. If you wish to download the file, please click the link:”

R7-10-2-2 MMS

R7-10-3 The file shall be transferred as RCS File Transfer in Group Chat, if all of the selected contacts are RCS capable.

US7-11 **As a user, I want to be able to cancel files while the sending process has not been completed yet.**

R7-11-1 The device shall provide the user with the option to cancel a File Transfer while the file is still in the process of being sent on the originating leg.

NOTE: Once the File Transfer on the originating leg is completed, there is no way for the sender to stop the process of File Transfer.

US7-12 **As a user, I want to transfer a file with my contacts even when they're temporarily offline (e.g. device switched off).**

R7-12-1 In case the B-Party is currently "offline", the request to deliver the file shall be delivered to the B-Party device once the user is "online" again.

NOTE: This requirement refers to the Store and Forward feature.

R7-12-2 If a user attempts to download a file that has expired from the network storage, they shall be informed that the file is no longer available.

NOTE: This requirement relates to the Store and Forward feature.

US7-13 **As a Service Provider, I want to limit how long a file is available on the network for offline users.**

R7-13-1 The Operator shall be able to define the network storage time for File Transfers that have not been downloaded yet.

NOTE: This requirements relates to the Store and Forward feature.

US7-14 **As a user, I want the device to notify me about new incoming files in a similar way to new incoming messages.**
As a user, I want to be notified in case of incoming positions / locations.

R7-14-1 On receiving a file or preview thumbnail, the user shall be notified with graphical and sound elements (in a similar way to how the device notifies about incoming messages).

NOTE: The standard customisation options of the device for incoming notifications shall be available.

R7-14-2 For audio notifications of a new File Transfer request, device settings shall prevail.

R7-14-3 Rapid sequence of incoming File Transfer requests and Chat messages in one Chat conversation shall be consolidated into one audible notification per Chat conversation. Visual notifications are not affected.

R7-14-4 On selection of the visual notification for a File Transfer, the user shall be directed to the respective thumbnail preview (in case of auto-accept is off) or file (in case File Transfer auto-accept is on) within the Chat or Group Chat conversation.

R7-14-5 The visual notification for an incoming File Transfer shall be permanently removed from the notification centre bar, once the thread with the file or thumbnail preview has been opened.

NOTE: Independently of whether the user has clicked the notification or has accessed the thread from the messaging application.

R7-14-6 Any audible or visual notification shall be suppressed in case the reception is visible on the currently active screen of the device (e.g. if the user is currently on the chat screen with a person and a File Transfer is received).

R7-14-7 For notification of a new incoming location or position, the above mentioned requirements shall be valid accordingly.

R7-14-8 If the device supports a notification LED (for screen-off notification) then this LED shall flash as long as there are un-opened RCS File Transfers. The colour should differentiate from notifications from other applications, but may be identical for all Operator Messaging Services.

US7-15 **As a user, I want to receive incoming files within a new or existing Chat or Group Chat conversation.**
As a user, I want sent and received files to be part of the Chat or Group Chat conversation thread in similar order and appearance of chat messages, but representing the transferred content.

R7-15-1 Incoming files shall be displayed within a new or existing Chat Conversation.

R7-15-2 Sent or received files shall be threaded in the conversation as an event similar to chat messages. The same ruling for order of messages as specified in '1-to-1 Chat', see section 2.5 and 'Group Chat', see section 2.6 shall be applied to files.

R7-15-3 Group Chat conversations shall be sorted descending according to the time stamp of the last action (e.g. but not limited to, a received File Transfer, Audio Message or Geolocation Push) within the conversation (i.e. the conversation with the latest event timestamp shall be on top of the list).

R7-15-4 Chat or Group Chat conversations with unread events (any event that is received within the Chat conversation, including, but not limited to, Chat messages, received files, received Geolocation Push, received Audio Messages) shall be marked accordingly, e.g. by display of subject line in bold font and / or a unread message counter.

R7-15-5 The user shall have the option to select a file and forward / share the file with contacts from the contact list.

R7-15-5-1 On the UX level, sharing received content from the chat conversation shall be a straightforward experience.

R7-15-5-2 Sharing files from the RCS implementation shall not be restricted to RCS services but support all applications with sharing capability that the device OS is aware of.

R7-15-6 If a shared file is a picture of supported picture format, the user shall have the option to select the file and display in full screen mode.

R7-15-7 Incoming MMS messages shall be threaded into conversations similar to 1-to-1 Chat messages and File Transfers.

US7-16 **As a user, I want to see incoming files as a thumbnail preview (or generic icon if content cannot be rendered on receiving device) including file size indication.**
As a user, I want to trigger file download to my device by selecting the thumbnail preview.
As a user, I want to be in control of the acceptance of the File Transfer (individually or for all File Transfer events).

R7-16-1 In case "File Transfer Auto-Accept" is set to "OFF":

R7-16-1-1 The incoming File Transfer presents a thumbnail preview of the file, including file size, on the receiving device first.

R7-16-1-2 The thumbnail preview shall be a preview of the actual picture (if the file type is a picture in a format that can be rendered by the receiving device), a file type specific icon.

NOTE: There shall be file type specific icons at minimum for standard RCS content types for Contact Card, Audio Messaging and Geolocation Push or a generic icon.

R7-16-1-3 Selection of the preview icon on the receiving device shall trigger the download of the full file to the user's device.

R7-16-1-4 The user shall have the option to delete the thumbnail preview without downloading the content.

R7-16-2 On the B-Party client, if a File Transfer download link was delivered using Delivery Assurance, the link shall not be displayed in plain text but a consistent UI shall represent the link to ensure a user experience as close as possible to the full RCS experience.

R7-16-2-1 Handling of the file, including display of a picture, should be managed by the RCS application. It should be avoided, if technically possible, to change the application and e.g. open a browser.

R7-16-2-2 The file size shall be visible to the B-Party user before the download.

R7-16-2-3 The B-Party user shall be informed accordingly, if the file download is not possible due to missing connectivity.

R7-16-2-4 The B-Party client shall visually differentiate between File Transfer and Geolocation Push by using different visual presentations.

R7-16-2-5 The B-Party client should visually differentiate between different file types (e.g. known formats of picture, audio, music and video) by using different visual presentations.

R7-16-2-6 Once the B-Party device is online again, it shall automatically download the content from the server if the user has enabled File Transfer auto-download in settings.

NOTE: Operator procedures of 'warn_size' and 'max_size' shall apply.

R7-16-2-7 If auto-download of the File Transfer cannot be performed, the user shall be prompted to download the file.

R7-16-2-8 If the File Transfer content is a picture that can be rendered by the B-Party device, the generic icon in the chat conversation with A-party shall be replaced with a thumbnail view of the actual picture after download.

R7-16-2-9 The B-Party client may offer functionality that allows the http-link to be seen in plain text by the user, e.g. in a 'Details' menu of the message.

R7-16-2-10 If the recipient of the link is a legacy RCS device, then the Uniform Resource Locator (URL) should be in a format that allows the user to see that the link comes from his operator, which is a trusted party. (If technically required, it might be the originating network identifier as well). This link shall be accompanied by a 'cover note' in local language that conveys the following message: "You have received a file that originates from the sender as indicated. If you wish to download the file, please click the link:"

R7-16-2-11 HyperText Transfer Protocol (HTTP) links received as content of a chat message (not in the context of Delivery Assurance) shall be displayed in plain text format.

R7-16-3 In case File Transfer Auto-accept is set to "ON":

R7-16-3-1 The user shall not have to accept the download for each received File Transfer.

R7-16-3-2 The file shall be automatically downloaded and shall be accessed in the Chat conversation.

R7-16-4 The Operator shall have the option to set the default value for “File Transfer Auto Accept” via the device provisioning process.

R7-16-5 The user shall have the option to select or deselect “File Transfer Auto-Accept”.

US7-17 **As a user, I want to have a visible notification about the status of received files.**

R7-17-1 File Transfer shall support status notifications per individual file (receiver device):

R7-17-1-1 In case of auto accept off: Thumbnail preview received – indication that file is waiting for download trigger on receiving network.

R7-17-1-2 File Transfer in progress on receiving device – file transfer started but not yet completed.

R7-17-1-3 Cancelled – the receiver shall have the option to cancel the File Transfer during the File Transfer process.

R7-17-1-4 File downloaded.

R7-17-1-5 File Transfer failed – File Transfer could not be confirmed successfully completed by the network and client does not attempt to retrieve the file any further. (In case of File Transfer Store and Forward function is available, the user may be able to manually re-trigger File Transfer and resume from where the File Transfer failed. In case of no File Transfer Store and Forward, the user has the option to ask the sender to re-send the file).

US7-18 **As a user, I want to transfer a contact information from the contact list to other RCS users.**

R7-18-1 Selecting “Send Contact” from a Contact Card shall send the Contact details in vcf-format to a recipient that shall be selected.

NOTE: vCard as the default format, details on Personal Card format, see Annex A.1.

R7-18-2 Devices shall be capable to render vCard files in .vcf format according to RCS standard (see Annex A.1 ‘Personal Card format’) and offer to store received Contacts in the device contact list.

US7-19 **As a user, I want to be able to resume interrupted File Transfers.**

NOTE: On sending and receiving side.

R7-19-1 If a File Transfer has been interrupted on the sending or receiving side (e.g. in case of, but not limited to, if device lost radio coverage), the File Transfer shall resume automatically from the point of interruption once the required conditions have been restored (e.g. device is back in radio coverage).

R7-19-2 If the receiver’s device does not have enough storage space to download the full file:

R7-19-2-1 A notification shall be provided to the receiver before downloading the full file.

R7-19-2-2 Storage space shall be freed up manually by the receiver before download attempt shall be possible.

R7-19-2-3 The user shall have the option to re-start the file download as long as the Operator storage time (as in R7-13-1) has not expired.

US7-20 **As a Service Provider, I want to be able to limit the size of the files that are transferred.**

R7-20-1 If the sending device attempts to send a file larger than the limit for File Transfer, the A-Party shall be notified that the file exceeds the size limit supported by the service.

US7-21 **As a user, I want to administrate File Transfers in Chat and Group Chat conversations intuitively.**

R7-21-1 The user shall have the option to delete File Transfer events (outgoing or incoming) from a Chat or Group Chat conversation:

R7-21-1-1 Deleting a single File Transfer directly from the chat conversation.

R7-21-1-2 Delete multiple File Transfer events (with or without other associated events in the conversation such as Chat messages).

R7-21-1-3 Deleting a File Transfer from the Chat or Group Chat conversation shall delete the entry in the conversation thread.

R7-21-2 If received or sent files are automatically stored on a device (e.g. an RCS gallery on the device picture gallery), then deleting the File Transfer events from the conversation thread does not automatically delete any files from this repository. In case the user permanently wants to delete this content, separate user action is required (as per individual device operation).

US7-22 **As a user, I want the ability to share my current position or a selected location with any of my contacts (RCS contacts or legacy non-RCS contacts).**

NOTE 1: Pre-requisite: The Geolocation Push Service relies on a map function on the sending device that supports the RCS functionalities.

NOTE 2: Pre-requisite: There is no intention to build positioning or map functions within the RCS standard.

R7-22-1 Chat and Group Chat shall be service entry points to initiate a Geolocation Push.

R7-22-2 There may be other service entry points available on the device to initiate a Geolocation Push (e.g. Contact Card, call log).

R7-22-3 The Geolocation Push Service should offer a ‘legacy mode’ to send positions or locations to non-RCS recipients or recipients with RCS versions that do not support Geolocation Push.

NOTE: Legacy mode may be provided by a link to online map display or a ‘screenshot’ with map picture.

US7-23 **As a user, I want to view an automatically detected position on map and have the ability to change this manually before sending.**

R7-23-1 If the current position shall be sent, the location shall be automatically detected and suggested to the end user.

R7-23-2 The user shall have the option to preview and correct the automatically detected position on a map view before sending.

R7-23-3 The Geolocation Push service shall support sending of a location that was picked from the map.

US7-24 **As a user, I want to tag positions or locations with a text field.**

R7-24-1 The user shall have the option to tag a position or location with a free text field before sending.

US7-25 **As a user, I want to receive positions / locations in a map view.**

US7-26 **As a user, I want to use standard map functions e.g. "guide me to…" feature.**

NOTE: These functions are not provided by the RCS implementation.

R7-26-1 When receiving a position or location, the RCS Geolocation Push user shall have the ability to see the position / location on a map.

R7-26-2 When receiving a position or location, the RCS Geolocation Push user shall be able to see any tags that were added by the sender.

R7-26-3 When receiving a position or location, the RCS Geolocation Push user shall be able to use map and navigation tool functions such as 'guide me to…' feature.

NOTE: The compliance with this feature may depend on the capabilities of the receiving handset.

R7-26-4 When receiving a position or location, the legacy (non-RCS or RCS without Geolocation Push Service) user should receive either a link that opens a map application on the web, or a map image.

2.7.3 Technical Information

2.7.3.1 Overview

The File Transfer service is provided as defined in section 7.4 of [RCC.60] extended by functionality provided in this section to satisfy additional requirements for File Transfer fallback. The Geolocation Push service is provided as defined in section 3.10 of [RCS5.3]. For the definition of configuration parameters for File Transfer and Geolocation Push refer to Annex B.

2.7.3.2 File Transfer and Geolocation Push Fall Back

2.7.3.2.1 File Transfer and Geolocation Push via SMS Capability

The profile defined in this document defines new client capabilities for the support of the File Transfer via SMS service. A client supporting the rendering of the user data of a short message for File Transfer as defined in section 2.7.3.2.3 and the procedures for the HTTP(s) URI processing defined in section 2.7.3.2.6 shall advertise its capability via the media feature tag defined in Table 17 in SIP OPTIONS for capability discovery.

RCS service	Tag
File Transfer via SMS	+g.3gpp.iari-ref="urn%3Aurn-7%3A3gpp-application.ims.iari.rcs.ftsms"

Table 17: SIP OPTIONS tag for File Transfer via SMS

A client supporting the rendering of the user data of a short message for Geolocation Push as defined in section 2.7.3.2.4 and the procedures for "geo" URI defined in section 2.7.3.2.6 shall advertise its capability via the media feature tag defined in Table 18 in SIP OPTIONS for capability discovery.

RCS service	Tag
Geolocation Push via SMS	+g.3gpp.iari-ref="urn%3Aurn-7%3A3gpp-application.ims.iari.rcs.geosms"

Table 18: SIP OPTIONS tag for Geolocation Push via SMS

A client supporting the profile defined in this document shall add both feature tags defined in Table 17 and Table 18 in the Contact header field of the SIP REGISTER requests that it initiates and in the Contact header field of the SIP OPTIONS requests and responses.

2.7.3.2.2 HTTP Message Body Schema Extension

The HTTP Content Server should be able to assign a user friendly URL to a file uploaded by the client via the upload procedures defined in section 3.5.4.8.3.1 of [RCC.07] in addition to the existing URL for file download. The user friendly URL can be conveyed by the HTTP Content Server to the client via the "branded-url" element defined in the schema in Table 19.

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema targetNamespace="urn:gsma:params:xml:ns:rcs:rcs:joyn:fthttpext"
                xmlns:xs="http://www.w3.org/2001/XMLSchema"
                xmlns="urn:gsma:params:xml:ns:rcs:rcs:joyn:fthttpext"
                elementFormDefault="qualified"
                attributeFormDefault="unqualified">
        <xs:element name="branded-url" type="xs:anyURI"/>
</xs:schema>
```

Table 19: HTTP Message Body schema Extension

The "branded-url" element shall be added as an extension to the "data" element of the "file info" element of the HTTP Message Body schema defined in section 2.4 of [joyn-Guidelines].

Client receiving the "branded-url" element in a HTTP Content Server response body shall forward the element unaltered to recipients when using the HTTP message body.

The nature and structure of the URL value in the "branded-url" element is left to the discretion of the HTTP Content Server service provider.

NOTE: It is not the intention to use this branded URI within a Group Chat towards clients that do not support File Transfer via HTTP.

2.7.3.2.3 Parameter Definition for HTTP URL for File Transfer fallback

A client supporting File Transfer via SMS need to be able to determine additional meta information related to the file located on a HTTP Content Server by parsing the HTTP Content Server file URL.

A HTTP URL linking to a file located on a HTTP Content Server is identified by the HTTP Content Server FQDN defined in section 3.5.4.8.4 of [RCC.07].

The HTTP URL linking to a file on a HTTP Content Server is complemented with meta-information describing the file using the URL parameters defined in Table 20.

Parameter	Value
s	Integer, identifying the size of the file in bytes The presence of the parameter is mandatory, if the HTTP Content Server URL contains additional meta data describing the file.
t	String, value of the Multipurpose Internet Mail Extensions (MIME) content-type header of the file as defined in [RFC2045]. Note: reserved characters in the content-type header value have to be represented using percent encoding in accordance with [RFC3986]. The presence of the parameter is mandatory, if the HTTP Content Server URL contains additional meta data describing the file.
e	Combined date and time in UTC time zone in ISO8601 basic format, i.e. YYYYMMDDThhmmssZ. It indicates the date and time of expiry of the file, e.g. 20160419T135227Z The presence of the parameter is mandatory, if the HTTP Content Server URL contains additional meta data describing the file.

Table 20: HTTP URL parameters for File Transfer fallback

The URL configuration parameter defined in Table 20 shall be appended to the HTTP Content Server file URI respecting the definitions of [RFC3986].

Note: It is recommended that implementations ensure that the maximum length of the URLs does not exceed the length of the user data of one short message.

2.7.3.2.4 Geolocation Push URI for fallback

A client supporting Geolocation Push fallback shall be able to

- generate, using RCS Location information data, and
- resolve and render

a “geo” URI according to [RFC5870].

For the purpose of Geolocation Push fallback the "geo" URI format of [RFC5870] is extended by a new parameter to carry a "label". The usage of the "label" parameter shall follow the definitions for the "label" in Geolocation Push defined in section 3.10 of [RCC.07].

"Geo" URI parameters extending [RFC5870] are defined in Table 21.

Parameter	Value Restriction	Value Definition
rcs-l	Constrained	Contains a label that can be used to tag the nature of the location (e.g. indicate that it's the home or provide an address, name of

		restaurant, etc.) in the context of Geolocation Push. If the label parameter is absent, the location that is shared is assumed to be the sharing user's own position. NOTE: non ASCII and reserved characters have to be represented using percent encoding in accordance with [RFC5870].

Table 21: "geo" URI Parameter Extensions

Note: It is recommended that implementations ensure that the maximum length of the URLs does not exceed the length of the user data of one short message.

2.7.3.2.5 Sender Procedures

2.7.3.2.5.1 File Transfer

Precondition for the application of File Transfer via SMS is that the client has uploaded a file to the HTTP Content Server as defined in section 3.5.4.8.3.1 of [RCC.07] and has received and kept the data of the HTTP Content Server response body.

Service providers complying to the profile defined in this document should add the HTTP URL parameters defined in Table 20 in the HTTP Content Server response body defined in section 3.5.4.8.3.1 of [RCC.07] to the value of the "url" attribute of the "data" element of the "file-info" element with the "type" attribute set to "file".

Service providers complying with the profile defined in this document should add a "branded-url" element containing a user friendly URL in the "file-info" element with the "type" attribute set to "file". The "branded-url" element shall follow the syntax defined in section 2.7.3.2.2.

A sample HTTP Content Server response body from a service provider with Content Server that includes the URL parameters defined in Table 20 in the value of the “url” attribute and the "branded-url" element defined in Table 19 is shown in Table 22.

```
<?xml version="1.0" encoding="UTF-8"?>
<file xmlns="urn:gsma:params:xml:ns:rcs:rcs:fthttp"
xmlns:e="urn:gsma:params:xml:ns:rcs:rcs:joyn:fthttpext">
    <file-info type="thumbnail">
        <file-size>82</file-size>
        <content-type>image/jpeg</content-type>
        <data url="https://ftcontentserver.rcs.mnc001.mcc262.pub.3gppnetwork.org/..."
        until="2017-04-22T19:30:00Z"/>
    </file-info>
    <file-info type="file">
        <file-size>32464</file-size>
        <file-name>example.jpg</file-name>
```

```
        <content-type>image/jpeg</content-type>
        <data
        url="https://ftcontentserver.rcs.mnc001.mcc262.pub.3gppnetwork.org/...?t=image%2Fjpeg&s=32464&e
        =20170422T193000Z"
        until="2017-04-22T19:30:00Z"/>
        <e:branded-url>https://www.operator.com/...<e:branded-url/>
    </file-info>
<file>
```

Table 22: Sample HTTP Content Server response body

If the originating client decides to fallback to SMS for a File Transfer and the recipient supports File Transfer via SMS, as indicated by the capability defined in section 2.7.3.2.1, then the sender client

- shall inspect the URL value of the "url" attribute contained in the data element of the file-info element with type "file" received in the HTTP message body received from the HTTP Content Server to determine whether URL parameters as defined in Table 20 are present, then,
- if there is none of the URL parameters defined in Table 20 present, then the client shall generate
    - a “s” parameter using the value extracted from the file-size element of the file-info element with type “file” included in the HTTP message body of the response as defined in Table 20
    - a “t” parameter using the value extracted from the content-type element of the file-info element with type “file” included in the HTTP message body of the response as defined in Table 20
    - an “e” parameter using the value extracted from the “until” attribute contained in the data element of the file-info element with type “file” included in the HTTP message body of the response as defined in Table 20
    - append it to the URL respecting the definitions of [RFC3986]
- otherwise use the URL unaltered
- add the URL value to the user data of a short message and
- send the short message to the recipient address.

If the originating client decides to fallback to SMS for a File Transfer and the recipient does not support File Transfer via SMS via the capability defined in section 2.7.3.2.1 then the client

- shall check whether the HTTP message body received from the HTTP Content Server contained an "branded-url" element in the file-info element with type "file", then
- if the "branded-url" element is present it shall use its value, otherwise
- it shall use the value of the "url" attribute contained in the data element of the file-info element with type "file",

- add the URL next to some explanatory text indicating the purpose of the message to the user data of a short message and
- send the short message to the recipient address.

2.7.3.2.5.2 Geolocation

If the originating client decides to fallback to SMS for a Geolocation Push message and the recipient supports Geolocation Push via SMS as indicated by the capability defined in section 2.7.3.2.1 then the sender client shall use the position and the label of the RCS Location information data sent in the Geolocation Push message and generate a "geo" URI as defined in section 2.7.3.2.4.

2.7.3.2.6 Receiver Procedures

On reception of a SMS message, the client shall parse the user data of the message.

If the user data contains a HTTP(s) URL and the FQDN of the URL conforms to the definitions of the HTTP Content Server URI as defined in section 3.5.4.8.4 of [RCC.07], then the client shall apply the UX procedures defined for suppression and replacement of the HTTP Content Server URI. The client shall take the URL parameters for File Transfer fallback as defined in section 2.7.3.2.3 into account. When retrieving the file, the client shall use the URL as received in the user data of the short message.

If the user data contains a "geo" URI as defined in [RFC5870], then the client shall apply the UX procedures defined for suppression and replacement of the "geo" URI string. The client shall apply the rules for the presence and absence of the "label" via the "geo" URI extension defined in section 2.7.3.2.4 in accordance with the definitions of section 3.10 of [RCC.07].

2.7.3.2.7 Network Procedures for Fall Back for File Transfer and Geolocation Push

The procedures in the network for fallback for File Transfer and Geolocation Push are network internal and therefore outside of the scope of this document. However, to facilitate a solution at a later time, as specified in section 2.7.3.2.1 the UE shall include the IARIs defined in Table 17 and Table 18 in the Contact header field of the SIP REGISTER request along with the rest of the feature tags the UE is required to include, as described in [RCC.07]. The formats of the SMS messages sent shall follow the formats defined for the client-based fallback defined in section 2.7.3.2.5.

2.7.3.3 Technical Implementation of User Stories and Service Requirements

R7-27-1 For the requirements of user story US7-1 the following definitions apply:

- The File Transfer service is provided using the procedures in section 4 of [RCC.60].
- The File Transfer service shall be offered to the user if the device configuration authorises the service via the PROVIDE FT parameter defined in section A.1.5 of [RCC.07].
- The ability of the user to send files or links to a contact depends on the result of the capability discovery as defined in section 2.7 of [RCC.07] and section 2.7.3.2.1 of this document.
- The network indication to support Delivery Assurance via support of Message Revocation or Network interworking is defined in section 2.5.3.2. If the indication for support of Delivery Assurance is not

present, then the client shall follow the procedures defined in section 2.4.

R7-27-2 The requirements of user story US7-2 shall be implemented locally on the device based on the network indication to support Delivery Assurance via Message Revocation as defined in section 2.5.3.2 and the procedures for File Transfer and Geolocation Push as defined in section 2.7.3.2.5. The time after reconnection to allow File Transfer status notification in requirement R7-2-2-2-2 is controlled via the RECONNECT GUARD TIMER parameter defined in section 2.5.3.6.

R7-27-3 For the requirements of user story US7-3 the following definitions apply:

- The File Transfer service shall be offered to the user if the device configuration authorizes the service via the PROVIDE FT parameter defined in section A.1.5 of [RCC.07].
- The ability of the user to send files to a contact depends on the result of the capability discovery as defined in section 2.7 of [RCC.07].
- File Transfer is implemented as defined in section 7.4 of [RCC.60].
- For R7-3-7-1 and its sub-requirements, the client shall rely on the procedure defined in section 3.5.4.8.6 of [RCS6.0] including the use of the FT HTTP FALLBACK client configuration parameter defined in section A.1.5 of [RCS6.0] to enable and disable it. If a SMS message is to be sent to a non-RCS user according to this mechanism, a client complying to the profile defined in this document shall generate the SMS in the same way as defined in section 2.7.3.2 for a message towards a recipient that does not support File Transfer and Geolocation Push via SMS, including the support for the branded URL. As specified in [RCS6.0] if FT HTTP FALLBACK is disabled, MMS shall be used.

R7-27-4 The requirements of user story US7-4 shall be implemented locally on the device.

R7-27-5 The requirements of user story US7-5 shall be implemented as follows. The implementation depends on the file transport technology used:

- **Pending**:
  For File Transfer over MSRP; when the user presses ENTER to send the message until the first SIP success response is received from the network.

  For File Transfer over HTTP and File Transfer over SMS; when the user presses ENTER to send the message until the first HTTPs POST success response is received from the network.

  The File Transfer may be in this state for some time when the user is NOT registered with the IMS core (e.g. offline or airplane mode).
- **Progress:**
  For File Transfer over MSRP; from the reception of the first SIP Response is received from the network until the final MSRP 200 OK is received.

  For File Transfer over HTTP; from the reception of the first success

HTTP response from the network until a provisional response is received from the network for the SIP INVITE or a MSRP 200 OK is received from the network for the chat message carrying the File Transfer via HTTP message body content.

For File Transfer over SMS; from the reception of the first success HTTP response from the network until a successful SMS submit confirmation is received from the network for the short message carrying the File Transfer via SMS link.

- **Cancelled**: If the user has cancelled the File Transfer and the client did invoke the user story US7-11.
- **Sent**:
  For File Transfer over MSRP; when receiving the final MSRP 200 OK.

  For File Transfer over HTTP; when receiving the provisional response for the SIP INVITE or a MSRP 200 OK for the chat message transferring the File Transfer via HTTP message body.

  For File Transfer over SMS; when receiving a successful SMS submit confirmation from the network for the short message carrying the File Transfer via SMS link.
- **Delivered**:
  For File Transfer over MSRP; same as sent.

  For File Transfer over HTTP, when receiving the Delivery Notification or the Interworking Disposition notification defined in section 2.5.3.2. The requirement R7-5-1-4-1 shall be realised based on the Interworking disposition notification as specified in section 2.5.3.2, i.e. the client should indicate that the user should not expect a downloaded status for the message in this case.

  Note: An originating client may receive for a chat message both a delivery and an interworking disposition notification, e.g. due to future support of multi device in the terminating network. Reception of the delivery disposition notification overwrites the "interworking" status of the message".

  For File Transfer over SMS, when receiving the SMS delivery report. The client should indicate to the user not to expect a downloaded status for the message in this case.

- **Downloaded**:
  For File Transfer over MSRP, same as delivered.

  For File Transfer over HTTP, when receiving the Display Notification. If Interworking Disposition notification has been received but no delivered notification, as defined in section 2.5.3.2, then the Downloaded status

is not applicable.

The requirement R7-5-1-5-1 shall be realised based on the Interworking disposition notification as specified in section 2.5.3.2, i.e. the client should indicate that the user should not expect a downloaded status for the message in this case.

For File Transfer over SMS, not applicable.

- **Failed:**
  When a notification that the file has been sent is not received and the device does not attempt to transfer the file anymore.

NOTE: The A-Party Operator shall ensure that duplication of messages within the Operator Messaging application is avoided within their network control.

R7-27-6 Notifications on delivery status information as defined in R7-5-2 shall be stored and forwarded in the Store and Forward server as specified in section 3.3.4.1.5 of [RCC.07]. For SMS, delivery of delivery reports are applied in accordance with [3GPP TS 23.040].

R7-27-7 The requirement R7-6-1 shall be implemented locally on the device. When transferring a large image using File Transfer (regardless of whether it is HTTP or MSRP based), as described in R7-6-1 a client shall check whether it is possible to reduce the size of the image as defined in section 7.4.3.2 of [RCC.60]

R7-27-8 The requirement of user story US7-7 shall be implemented locally on the device.

R7-27-9 The file size limits required in requirements of the user story US7-8 are configured via the FT MAX SIZE and FT WARN SIZE parameters defined in section A.1.4 of [RCC.07].

R7-27-10 For the technical implementation of user story US7-9 the following applies. For File Transfer in a Group Chat session only the File Transfer over HTTP technology will be used. Thus, the conference focus will indicate support of File Transfer over HTTP as defined in section 3.5.4.8.3 of [RCC.07].

R7-27-11 The requirements in use case US7-10 shall be implemented locally on the device based on the following mechanisms:

R7-27-12 For R7-10-2 and its sub-requirements, the client shall apply the procedure depending on the value of the FT HTTP FALLBACK configuration parameter defined in section A.1.5 of [RCS6.0].

R7-27-13 As a clarification to the requirements R7-10-2-1 and sub-requirements, if FT HTTP FALLBACK is enabled, the client shall upload the file to the FT Content Server only once and determine per target address whether File Transfer over HTTP or SMS message with a link is to be used in accordance with the contact's capabilities. If a SMS message with a link is to be sent to a non-RCS user according to this mechanism, a client complying to the profile defined in this document shall generate the SMS in the same way as defined in section 2.7.3.2 for a message towards a recipient that does not support File Transfer and Geolocation Push via SMS, including the support for the branded URL.

R7-27-14 As specified in [RCS6.0] if FT HTTP FALLBACK is disabled, MMS shall be used.

R7-27-15 The technical implementation of the cancelation of the File Transfer via MSRP as required in user story US7-11 is defined in section 3.5.4.3 of [RCC.07]. A File Transfer via HTTP shall be cancelled by interruption of the ongoing HTTP transfer flow at the time of user input.

R7-27-16 The technical implementation of File Transfer Store and Forward of user story US7-12 is defined in sections 3.5.4.8 of [RCC.07]. The file will remain stored for a period determined based on Service Provider policy fulfilling the requirement in R7-12-1.

R7-27-17 The requirement of user story R7-13-1 is provided by the Service Provider's policy on the messaging server or the HTTP Content Server.

R7-27-18 The requirements of user stories US7-14 and US7-15 shall be implemented locally on the device.

R7-27-19 The client's File Transfer auto accept behaviour defined in requirements of user story US7-16 are controlled via the FT AUT ACCEPT parameter defined in section A.1.4 of [RCC.07].

The requirements of the user story US7-16 related to thumbnail preview are implemented for File Transfer over MSRP as defined in section 3.5.4 of [RCC.07] and for File Transfer over HTTP as defined in section 3.5.4.8 of [RCC.07].

R7-27-20 The requirements of user story US7-17 shall be implemented locally on the device.

R7-27-21 The transfer format for personal cards of user story US7-18 is defined in section 3.5.4.9.1 of [RCC.07].

R7-27-22 The requirement to resume interrupted File Transfers of user story US7-19 shall only be supported if File Transfer over HTTP is used as defined in section 3.5.4.8 of [RCC.07].

R7-27-23 The file size limits defined in the user story US7-20 are configured via the FT MAX SIZE parameter defined in section A.1.4 of [RCC.07]. To allow increasing the File Transfer maximum size at a future date, a client complying to the profile defined in this document shall not restrict the size of an incoming file that can be accepted (i.e. similar to the behaviour of a client configured with FT MAX SIZE INCOMING set to "0" in [RCS6.0]).

R7-27-24 The requirements of user story US7-21 is implemented locally on the device.

R7-27-25 The requirements of the user stories from US7-22 to US7-26 are implemented via the Geolocation Push feature defined in section 3.10 of [RCC.07] and the Geolocation Push via SMS feature defined in section 2.7.3.2.

2.7.3.4 Backward Compatibility

Blackbird and CPR networks will not provide the configuration parameter FT HTTP FALLBACK in the configuration document. In this case the client shall apply the default value as defined in section A.1.5 of [RCS6.0].

2.8 Audio Messaging

2.8.1 Description

The Audio Messaging feature allows RCS users to send Audio Messages to one or more RCS users at a time. Audio Messaging provides a new dimension of communication using the spoken voice to convey a message, allowing the recipient to listen to the message within their RCS interface. The handling of Audio Messaging files follows the rules of File Transfer as described in File Transfer incl. Geolocation Push with the following refinements detailed below.

2.8.2 User Stories and Feature Requirements

US8-1 **As a user, I want to record and send an Audio Message to one or more of my RCS contacts at a time.**

R8-1-1 An RCS user with the Audio Messaging feature will be able to see which of their contacts can receive Audio Message files.

NOTE: This is not based on a specific Audio Messaging capability, but the ability of the user to support RCS File Transfer as per 'Capability Discovery and Service Availability'.

R8-1-2 It shall be possible to record and send an Audio Message in Chat and Group Chat conversations.

R8-1-3 Audio Messaging shall use File Transfer Store and Forward as defined in the File Transfer section.

R8-1-4 Audio Messaging service shall be capable of sharing exactly one Audio Message at a time.

R8-1-5 The Audio Message shall stay within limits of the File Transfer maximum size limits as defined in the File Transfer section.

R8-1-6 Interruptions in transfer of Audio Messages shall be handled as defined in the File Transfer section.

2.8.2.1 Sending Audio Messages

R8-1-7 Any RCS user shall be able to send an Audio Message to Contacts in the contact list or by entering the contact's MSISDN.

R8-1-7-1 It shall be possible to create and send an Audio Message to an RCS contact from an existing 1-to-1 Chat or Group Chat session.

R8-1-7-2 A UI entry point of the contact card of an RCS contact shall allow the possibility of creating and sending of an Audio Message.

R8-1-7-3 A UI entry point of the messaging application shall allow the possibility of creating and sending of an Audio Message.

R8-1-7-4 A UI entry point from the call log or call history for RCS contacts shall allow the possibility of creating and sending of an Audio Message.

R8-1-8 Audio Messaging within a Group Chat shall transfer the Audio Message to all participants in the Group Chat.

NOTE: The sender side shall only send the file once over the network in this case.

R8-1-9 Audio Messages are created by a simple user interaction e.g. pressing or holding down a soft key or button to record the message. Once the soft key

or button is pressed again or released, the message recording is terminated and the Audio Message may be presented to the sender for playback and/or sending.

R8-1-10 Audio Messaging shall support status notification per individual Audio Message as (sender side) described in user story US7-5 and the supporting requirements.

R8-1-11 The sender shall be able to cancel the sending of an Audio Message before transfer is complete in accordance with requirements in the 'File Transfer incl. Geolocation Push' section.

R8-1-12 If a sender is interrupted when they are recording an Audio Message, e.g. by an incoming call, then the recording shall stop, and the recording that was made shall be held in the device for later use.

R8-1-13 Sent Audio Messages shall be displayed and available for playback from a Chat conversation which is associated with the participant(s) concerned.

R8-1-14 Audio Message recording shall be limited to either ten minutes or a duration based on the maximum file size supported by the Operator, whichever is smaller.

R8-1-15 Once the maximum Audio Message duration or File Transfer maximum size limit has been reached during a recording, the recording shall stop and the user shall be informed that the message has reached its limit. The Audio Message sharing process shall then continue as if the user had chosen to stop recording manually.

R8-1-16 The limits imposed by the maximum duration and maximum file size of the Audio Message recording shall not affect the quality of the audio recording. I.e. if the maximum file size does not accommodate a duration of ten minutes in the handset's standard recording format, the recording shall not be carried out at a lower quality to guarantee a ten minute length, but a shorter duration limit shall apply.

NOTE: Operators should consider this maximum length when setting the maximum file size supported by a File Transfer.

R8-1-17 During Audio Message recording, a progress bar or countdown timer may be shown to indicate how long the user is able to record for before recording is stopped automatically and the next step in the Audio Message sending process is followed.

2.8.2.2 Notification on Receiving Audio Messages

US8-2 **As a user, I want to be able to receive and listen to Audio Messages that are shared with me as part of a 1-to-1 Chat or Group Chat session.**

R8-2-1 Notifications on reception of an Audio Message or preview icon shall be in line with the according requirement/s in the File Transfer section.

R8-2-2 A new Audio Message notification may look different from a new Chat message or File Transfer notification in order to indicate it as being an Audio Message.

R8-2-3 Sorting of Chat and Group Chat conversations on new incoming Audio Messages shall be in line with the according requirement/s in the File Transfer section.

R8-2-4 Selecting a visual notification shall trigger the appropriate action according to requirements in the File Transfer section.

2.8.2.3 Receiving Audio Messages

R8-2-5 It shall be possible to receive and play an Audio Message in a 1-2-1 Chat and a Group Chat.

R8-2-6 For Audio Messaging, the rules of File Transfer Auto-Accept shall be in line with the according requirement/s in the File Transfer section.

R8-2-7 A user will be notified, as soon as they have come online, of Audio Messages sent to them whilst they were offline.

R8-2-8 If the receiving device does not have enough space to store the incoming Audio Message, the regulations in requirement R7-19-2 shall apply.

R8-2-9 When a user plays back an Audio Message, it shall be played through the handset's internal earpiece (telephone speaker) or through any other currently active audio output.

R8-2-10 There shall be an option for the user to switch the Audio Message playback to the handset's loudspeaker during playback of the message.

US8-3 **As a user, I want to find my Audio Messages as part of the Chat conversation with a specific contact or Group Chat.**

R8-3-1 It shall be possible to delete Audio Messages from a conversation thread according to requirements defined for files in the File Transfer section.

R8-3-2 Audio Messages shall be stored on a central Operator storage in accordance with the requirements defined in the File Transfer section.

R8-3-3 Audio Messages shall display an Audio Messaging specific icon in the Chat or Group Chat conversation. The Audio Message icon shall provide a clear visual association with the Audio Message file type, so that a user shall easily identify it as a sound file and shall understand that clicking on it will lead to download and/or playback of an Audio Message.

R8-3-3-1 This icon shall be visually distinguishable from a music file icon.

R8-3-4 Audio Messages shall be available for playback from the Chat or Group Chat conversation by sending and receiving parties.

R8-3-5 Audio Messages shall be saved in the conversation history along with Chat messages and files in a chronological order (as per ordering requirements specified in Chat and Group Chat sections).

R8-3-6 Audio Messages shall be displayed with information on the message's time and date and duration.

R8-3-7 Incoming Audio Messages shall be represented in Chat conversations in accordance with requirements in the File Transfer section.

R8-3-8 Status notifications for incoming Audio Messages shall be supported in accordance with requirements in the File Transfer section.

2.8.2.4 Implementation Examples

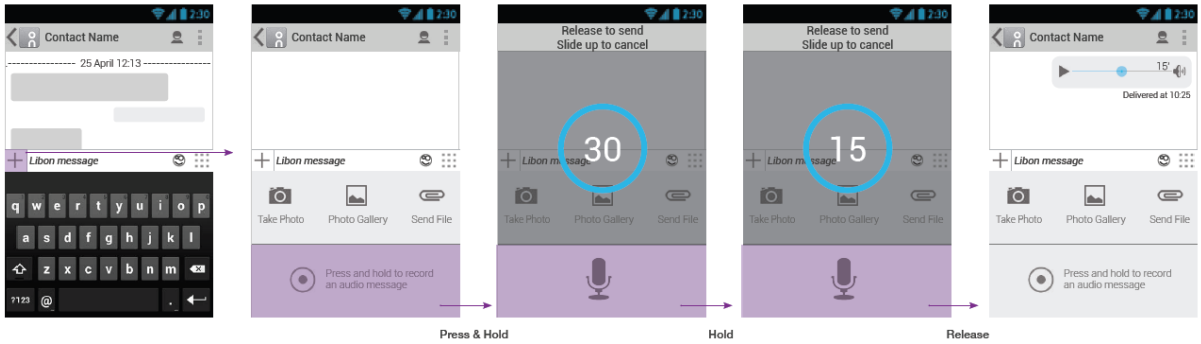

Figure 12: Sending an Audio Message

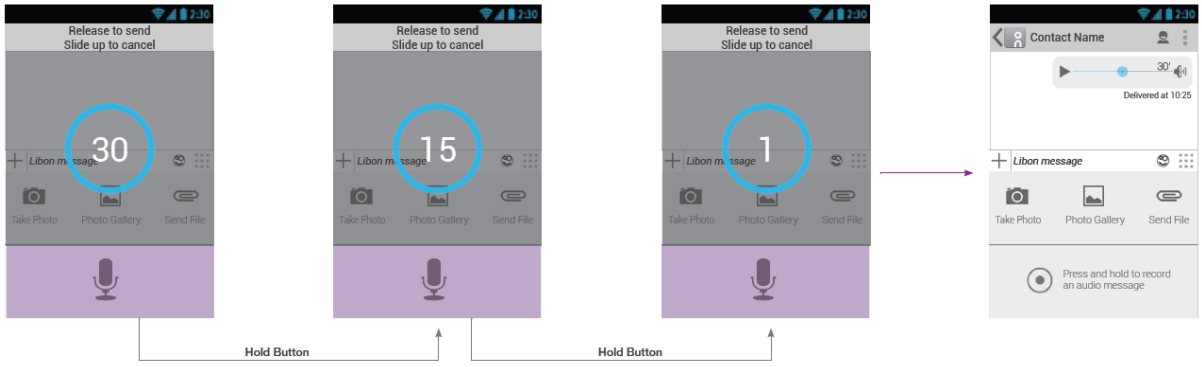

Figure 13: Stopping recording of an Audio Message when maximum duration is reached

2.8.3 Technical Information

2.8.3.1 Overview

An Audio Message is a specifically formatted file as per section 3.11.4.1 of [RCS6.0] that is recorded on the sender's device using the Adaptive Multi-Rate (AMR) codec and exchanged with contacts via the File Transfer feature.

Audio Message is a File Transfer specific content type as specified in sections 3.5.1.1.2 & 3.5.4.9.2 of [RCS6.0].

As such, Audio Messaging uses the procedure defined for File Transfer, as per [RCC.07] section 3.5, to exchange Audio Messages such as:

- Procedures for handling File Transfer interruptions and failures,
- Use of Delivery Notifications
- Rules for Auto-Accept
- Use of a local device blacklist

Rules for managing shortage of space for local storage

Any contact having the File Transfer capability is seen as being compatible with Audio Messaging.

An Audio Message is identified via its format (section 3.11.4.1 of [RCS6.0]) and shall be displayed accordingly by the UI. A specific icon, pre-embedded in the device, shall be associated to the Audio Message.

The content of the Audio Message can be played directly from the Chat application upon user action as indicated by the File Disposition being set to '*render*' (see section 3.11.4.2.2. of [RCS6.0]).

The maximum length of an Audio Message is set to a hard limit of 600 seconds (10 minutes).

2.8.3.2 Technical Implementation of User Stories and Service Requirements

R8-4-1 Audio Messaging shall be done as described in section 3.11 of [RCS6.0].

R8-4-2 Requirement R8-1-1 relies on the RCS Capability Discovery feature as per section 2.3. No specific "Audio Messaging" capability (tag or service) is added for this feature. As Audio Messaging relies on the File Transfer mechanism, support of Audio Messaging is derived from the support of the File Transfer capability (refer to Table 33 of [RCC.07]).

R8-4-3 As a file can be sent to one or more contacts, requirement R8-1-2 is covered.

R8-4-4 As Audio Messaging is based on the File Transfer mechanism as per [RCC.07] section 3.5, it inherits from the File Transfer features:

- Store and Forward is one of these features, hence, requirement R8-1-3 is covered.
- Interruptions in transfer of Audio Messages, hence, requirement R8-1-6 is covered.

R8-4-5 Requirement R8-1-4 shall be implemented locally on the device.

R8-4-6 Requirement R8-1-5 shall be implemented locally on the device taking the FT MAX SIZE parameter value into consideration.

2.8.3.2.1 Sending Audio Messages

R8-4-7 Requirement R8-1-7 and its sub requirements are UI related and shall be implemented locally on the device.

R8-4-8 To fulfil requirement R8-1-8, Audio Messaging uses the procedure defined for File Transfer, as per 'File Transfer incl. Geolocation Push' to exchange Audio Messages to a group of contacts.

R8-4-9 Requirement R8-1-9 shall be implemented locally on the device.

R8-4-10 Requirement R8-1-10 is covered via the File Transfer corresponding requirement (see 'File Transfer incl. Geolocation Push').

R8-4-11 Requirement R8-1-11 is covered by the ability to cancel a File Transfer (see 'File Transfer incl. Geolocation Push').

R8-4-12 Requirement R8-1-12 shall be implemented locally on the device.

R8-4-13 As an Audio Message is a file, it shall be part of a Chat conversation as required by requirement R8-1-13. The content of the Audio Message can be played directly from the Chat application upon user action. This is indicated by the File Disposition being set to 'render' (see section 3.11.4.2.2. of [RCS6.0]):

- For FToHTTP, the File Disposition is located in the *file-disposition* attribute of the file-info element of the main file.
- For FToMSRP, the File Disposition is the File-Disposition SDP attribute as described in [RFC5547].

R8-4-14 Requirement R8-1-14 shall be implemented locally on the devices with a maximum length of either a hard 10 minute limit or, if shorter, on the duration derived from the FT MAX SIZE parameter.

R8-4-15 Requirements R8-1-15, R8-1-16 and R8-1-17 shall be implemented locally on the device.

2.8.3.2.2 Notification on Receiving Audio Messages

R8-4-16 As an Audio Message is a file (see section 2.7):

- Notifications shall be triggered, hence, requirement R8-2-1 is covered.
- Sorting as per requirement R8-2-3 is covered.
- Action resulting to the selection of a visual notification as per requirement R8-2-4 is covered.

R8-4-17 Requirement R8-2-2 shall be implemented locally on the device.

2.8.3.2.3 Receiving Audio Messages

R8-4-18 Requirement R8-2-5 is covered since an Audio Message is a file with the File Disposition being set to 'render', making the Audio Message playable in a 1-2-1 Chat or Group Chat

R8-4-19 As an Audio Message is a file:

- It shall comply with the rules of File Transfer Auto-Accept as described in 'File Transfer incl. Geolocation Push', fulfilling R8-2-6.
- The Store and Forward mechanism as defined in 'File Transfer incl. Geolocation Push', will take care of requirement R8-2-7.
- Management of local storage space as required in 'File Transfer incl. Geolocation Push', will take care of requirement R8-2-8.

R8-4-20 Requirement R8-2-9 shall be implemented locally on the device.

R8-4-21 Requirement R8-2-10 shall be implemented locally on the device.

2.8.3.2.4 Audio Messages are part of the Chat Conversation with a specific contact or Group Chat

R8-4-22 As an Audio Message is a file:

- Deletion as required in File Transfer incl. Geolocation Push, is supported, fulfilling requirement R8-3-1.
- Storage in the Common Message store as defined in 'File Transfer incl. Geolocation Push', is supported, fulfilling requirement R8-3-2 and R8-3-5.

- Availability of Audio Messages from the Chat and Group Chat conversation follows the one defined for File Transfer as required in 'File Transfer incl. Geolocation Push', fulfilling requirement R8-3-4.The File Disposition being set to 'render' allows the Audio Message to be played directly from the Chat.
- Audio Messages are represented in Chat Conversations, fulfilling requirement R8-3-7.
- Status notifications for incoming Audio Messages shall follow the status notification for incoming File Transfer request as required in section 2.7 and fulfilling requirement R8-3-8

R8-4-23 Requirement R8-3-3 shall be implemented locally on the device. A file being identified as an Audio Message, according to its format defined in section 2.8.3.1 (Overview) shall be associated with a specific icon embedded in the Client.

R8-4-24 Regarding requirement R8-3-6, the message's time and date information are retrieved from the corresponding elements conveying the File Transfer request as per '1-to-1 Chat'', 'Group Chat' and 'File Transfer incl. Geolocation Push'. When using the FToHTTP technology, the duration is retrieved from the <playing-length> element of the File Transfer via HTTP message body as defined in Table 55 of [RCS6.0]. When using the FToMSRP technology, the duration may be derived by the Client via an extrapolation from the size of the AMR file.

2.8.3.3 Backward compatibility

2.8.3.3.1 Legacy network

The Audio Messaging being based on (legacy) File Transfer mechanism, a Pre-Universal device will be able to use this feature on a legacy network.

2.8.3.3.2 Legacy client

A legacy client is not able to send Audio Messages, however, it may receive Audio Messages via File Transfer request. Depending on its support of the file format and its support of AMR decoding, the legacy client may or may not be able to read the message.

2.9 Backup & Restore

In this profile Backup & Restore is a Universal Profile baseline feature which is covered in section 3.9.

2.10 Green Button Promise for Voice

2.10.1 Description

The Green Button Promise for voice describes the behaviour of the voice calling function on RCS/VoLTE devices under various coverage conditions delivered through VoLTE [PRD-IR.92], Wi-Fi Calling [PRD-IR.51] and CS voice calling services.

This section describes the User Stories and Service Requirements for the Green Button Promise for Voice Call services and all features around that core.

2.10.2 User Stories and Feature Requirements

US10-1 **As a user, I want one single entry point to voice call independent of the enabling voice service.**

R10-1-1 Any entry point to initiate a voice call from the device shall be a single button independent of the enabling voice service.

R10-1-2 The entry point for voice shall not distinguish the voice service which is used to enable the call.

US10-2 **As a user, I want to be able to make and receive voice calls with my mobile device while my device is registered on any cellular network bearer.**

R10-2-1 The voice call from a primary device shall be successful and meet the operator specific voice call performance criteria (e.g. call drop rates, successful call setup rates).

R10-2-2 Given the end-to-end support of high definition voice codecs, the voice call shall be delivered with high-quality audio.

R10-2-3 A device shall not distinguish ringtones to indicate of the enabling voice service.

US10-3 **As a user, I (i.e. user A or B) want to be able to make and receive voice calls with my mobile device in areas without sufficient cellular reception.**

R10-3-1 Voice calls shall be possible through a trusted (preferred) as well as untrusted Wi-Fi connection of the device.

NOTE: "Trusted Wi-Fi" refers to a Wi-Fi connection offered by the Service Provider or via a third party trusted by the Service Provider. "Untrusted Wi-Fi" refers to any other Wi-Fi connection.

R10-3-2 Wi-Fi voice calls from primary devices shall be successful and meet operator specific Wi-Fi Calling performance criteria (e.g. call drop rates, successful call setup rates).

R10-3-3 Given the end-to-end support of high-definition voice codecs, Wi-Fi voice calls shall be delivered with high-quality audio.

US10-4 **As a service provider, I want to configure Wi-Fi Calling on my network.**

R10-4-1 The device shall be configured by the network to enable or to disable the Wi-Fi Calling service per user.

R10-4-2 In case of concurrent availability of the voice services fulfilling same performance criteria it shall be up to operator specific implementation which voice call enabler to use.

US10-5 **As a service provider, I want the user to be able to manually turn on or turn off the Wi-Fi Calling.**

R10-5-1 If Wi-Fi Calling is supported on a network and Wi-Fi Calling is configured on the device, a Wi-Fi Calling switch in phone settings shall be visible to allow the user to turn on or turn off the Wi-Fi Calling.

R10-5-2 The default position of the switch shall be based on operator configuration (ON or OFF).

R10-5-3 If a network / Operator does not support Wi-Fi Calling, no such Wi-Fi Calling switch shall be shown to the user on the device.

R10-5-4 The user shall be able to manually deselect a Wi-Fi connection from providing Wi-Fi Calling.

R10-5-5 In case the user is no longer entitled to use Wi-Fi Calling, any incoming or outgoing call while the device is connected to Wi-Fi shall be routed as normal cellular voice service and the Wi-Fi Calling switch shall no longer be visible.

US10-6 **As a service provider, I may want to provide emergency call services even if Wi-Fi Calling is the last resort for voice call connectivity.**

R10-6-1 Emergency call services shall always use a cellular voice call as long as available (including potential national roaming if required by local regulators).

R10-6-2 Emergency call services may use the Wi-Fi connection if no cellular connection is available at the moment the call is placed.

US10-7 **As a service provider, I may want to allow supplementary services both for voice calls on cellular and over a Wi-Fi connection like Calling Line Identification Presentation (CLIP), Call Waiting (CW), Call Hold, Call Forward Busy (CFB), Call Forward Unreachable and Call Forward No Reply.**

R10-7-1 Supplementary Services such as Calling Line Identification Presentation (CLIP), Call Waiting (CW), Call Hold, Call Forward Busy (CFB), Call Forward Unreachable and Call Forward No Reply may be offered by a service provider during any voice call independent of the actual voice service.

US10-8 **As a user, I want to use Dual Tone Multi-Frequency (DTMF) tones during calls both on cellular and over a Wi-Fi connection.**

R10-8-1 DTMF should be supported during a call over both on cellular and over the Wi-Fi connection in both the sender‘s and receiver’s experience.

US10-9 **As a user, I want to know which bearer (Cellular or Wi-Fi) is used for the voice call.**

R10-9-1 The device shall inform the user in a non-intrusive way (e.g. similar to the network indicator in the notification bar or in the in-call screen) that the Wi-Fi connection is used or going to be used for any potential outgoing or incoming voice calls.

R10-9-2 During an on-going call over Wi-Fi an indication of the connection quality should be displayed to indicate any potential impact of a poor Wi-Fi connection causing a poor voice call quality.

US10-10 **As a user, I want my voice call to continue in case of connectivity change.**

R10-10-1 The terminal shall support call continuity from LTE to non-LTE connectivity situations and vice versa in cases where LTE connectivity is not available.

R10-10-2 The terminal shall support call continuity from Wi-Fi to LTE and vice versa where LTE coverage is available.

R10-10-3 The terminal shall support call continuity from Wi-Fi to non-LTE connectivity situations and vice versa.

US10-11 **As a user, I want to have the same options to react to an incoming call independent of the enabling voice service used and whilst there is no other on-going call.**

R10-11-1 It shall be possible for a user to be notified about an incoming voice call in the same way, independent of the actual voice service used. The user shall then be able to:

a) Reject the incoming call.

b) Accept the incoming call.

US10-12 **As a user, I want to have the same options to react to an incoming call independent of the enabling voice service used and whilst being engaged in another on-going call (when this service is provided by the service provider).**

R10-12-1 It shall be possible for a user to be notified about an incoming voice call during another on-going voice call in the same way, independent of the actual voice service used. The user shall then be able to:

a) Reject the incoming call.
b) Accept the incoming call and put the on-going one on hold. Once the new call ends, the one on hold *shall* resume automatically.
c) Accept the incoming call and terminate the on-going call.

US10-13 **As users in a voice call, we want to mute (and unmute) the own voice (i.e. mute microphone) at any point during the call without interrupting the call.**

R10-13-1 Each user in a voice call shall be able to mute (and unmute) their own live audio at any point during the call.

US10-14 **As a user, I want to see voice calls independent of the actually used voice service in my on-device activity log / call log where voice calls are used to be listed.**

R10-14-1 Calls over Wi-Fi shall be listed in the same way as CS / VoLTE calls in the same call log view, each visually differentiated whether it was an outgoing, incoming and answered, or incoming but missed call.

R10-14-2 The visual indication in the call logs shall be the same independent of the enabling voice service.

2.10.3 Technical Information

2.10.3.1 Overview

Voice over LTE (IR.92 voice) is a technical enabler for delivering a voice call service when in LTE coverage as defined in [PRD-IR.92].

Voice over EPC-integrated Wi-Fi (IR.51 voice) is another technical enabler for delivering voice call service under Wi-Fi access as defined in [PRD-IR.51].

IR.92 and IR.51 voice are profiles of the 3GPP Multimedia Telephony service taking access specific differences into account. The clients are expected to support the common set of procedures and the access specific functions described in [PRD-IR.92] and [PRD-IR.51].

Traditional Circuit Switched (CS) voice services are delivered on 2G/3G networks.

RCS IP Voice call is not supported for primary devices.

2.10.3.2 Technical Implementation of User Stories and Service Requirements

R10-15-1 Requirements R10-1-1 and R10-1-2 shall be implemented locally on the device.

R10-15-2 The implementation details to meet the key performance criteria of the voice service defined in Requirement R10-2-1 are left to the discretion of the service provider.

R10-15-3 Requirement R10-2-2 shall be fulfilled based on Real-time media negotiation, transport and codec procedures described in section 3 of [PRD-IR.92].

R10-15-4 Requirements R10-2-3 shall be implemented locally on the device.

R10-15-5 Requirement R10-3-1 shall be implemented based on procedures defined in [PRD-IR.51].

R10-15-6 The implementation details to meet the key performance criteria of the voice service defined in requirement R10-3-2 are left to the discretion of the service provider.

R10-15-7 For requirement R10-3-3, section 3 of [PRD-IR.51] shall apply

R10-15-8 Requirement R10-4-1 shall be fulfilled by configuring the PROVIDE IR51 VOICE parameter defined in section A.1.12 of [RCS6.0].

R10-15-9 Requirement R10-4-2 is fulfilled based on service provider policy.

R10-15-10 Requirements R10-5-1, R10-5-2 and R10-5-3 shall be fulfilled based on the PROVIDE IR51 VOICE parameter defined in section A.1.12 of [RCS6.0] and IR51 SWITCH UX parameter defined in section 10.3.2 of [RCC.61].

R10-15-11 The requirement R10-5-4 shall be implemented locally on the device.

R10-15-12 For requirement R10-5-5, Wi-Fi service deactivation by the Service Provider shall result to user re-provisioning.

R10-15-13 For requirement R10-6-1 section 5.2 of [PRD-IR.92] and section 7.3 of [PRD-IR.51] shall apply.

R10-15-14 For requirement R10-6-2 section 5.3 of [PRD-IR.51] applies.

R10-15-15 Requirement R10-7-1 shall be fulfilled based on the technical procedures described in section 2.3 of [PRD-IR.92] and section 2.3 of [PRD-IR.51]. In addition Annex A.4 of [PRD-IR.92] applies.

R10-15-16 Requirement R10-8-1 shall be fulfilled based on the technical procedures described in section 3.3 of [PRD-IR.92].

R10-15-17 Requirements R10-9-1 and R10-9-2 shall be implemented locally on the device.

R10-15-18 For requirement R10-10-1 Annex A.3.2 of [NG.102] shall apply.

NOTE: SRVCC is only defined for moving from LTE to non LTE radio access. During a voice call there will not be a handover from non LTE to LET access.

R10-15-19 For requirement R10-10-2 section 2.18 of [NG.102] shall apply.

R10-15-20 For requirement R10-10-3 Annex A.3.1 of [NG.102] shall apply.

R10-15-21 Requirement R10-11-1 shall be implemented locally on the device. For the call termination procedures, for multimedia telephony section 2.2.4 of [PRD-IR.92] and section 2.2.4 of [PRD-IR.51] shall apply, for CS telephony [3GPP TS 24.008] shall apply.

R10-15-22 Requirement R10-12-1 shall be implemented locally on the device. For the call establishment and termination for the call termination procedures, for multimedia telephony section 2.2.4 of [PRD-IR.92] and section 2.2.4 of [PRD-IR.51] shall apply, for CS telephony [3GPP TS 24.008] applies. For the Communication Hold and the Communication Waiting service, section

2.3 and Annex A.8 of [PRD-IR.92] and section 2.3 of [PRD-IR.51] shall apply.

R10-15-23 Requirement R10-13-1 shall be implemented locally on the device.

R10-15-24 Requirements R10-14-1 and R10-14-2 shall be implemented locally on the device.

2.10.3.3 Backward Compatibility

Blackbird and CPR networks will not provide the parameter PROVIDE IR51 VOICE in the configuration document.

2.11 Green Button Promise for Video

2.11.1 Description

IP Video calling is an important feature to evolve the Operator calling experience. IP Video calling will offer a sustainable and reliable video calling experience across multiple devices and different bearers triggered by a single video calling 'button'. Widespread reach across user locations and use cases will be ensured. This section describes the User Stories and Service Requirements for Green Button Promise for IP Video Call services and all features around that core delivered through ViLTE [PRD-IR.94], Wi-Fi Calling [PRD-IR.51], and RCS IP Video Call [RCS6.0].

NOTE: This section focusses on general behaviour once a Video Call has been connected between users and in particular the behaviour of initiating a Video Call "from scratch", i.e. without being already in the context of an on-going voice call. The behaviour of upgrading an on-going voice call to a video call is described in section 2.12 (Enriched Calling).

2.11.2 User Stories and Feature Requirements

US11-1 **As a user, I (i.e. user A) want to initiate from various call related entry points (e.g. contact card, call logs) a lip sync IP video call to a contact (i.e. user B).**

R11-1-1 From any call related entry point on a device a user should be able to initiate an IP video call to a contact whenever it is possible.

R11-1-2 The IP Video Call shall offer lip sync experience.

R11-1-3 In the case there are multiple video call services available, the video call service that provides the higher service stability shall prevail.

R11-1-4 Any entry point to initiate an IP Video Call from the device shall be a single button independent of the enabling video call service.

NOTE: CS Video Call shall not be offered as part of this one-button experience.

R11-1-5 The entry point to initiate an IP Video Call shall not indicate the enabling IP Video Call service.

US11-2 **As a service provider, I want to configure the availability of the IP Video Call service depending on the different cellular data bearer conditions.**

R11-2-1 It shall be able to configure the availability of the IP Video Call service based on the different cellular data bearers.

US11-3 **As a user, I (i.e. user A or B) want to make and receive IP Video Calls with my mobile device in areas without sufficient cellular reception.**

R11-3-1 IP Video Calls shall be possible on trusted (preferred) and untrusted Wi-Fi connection of the device.

NOTE: "Trusted Wi-Fi" refers to a Wi-Fi connection offered by the Service Provider or via a third party trusted by the service provider. "Untrusted Wi-Fi" refers to any other Wi-Fi connection.

US11-4 **As a service provider, I want the Wi-Fi Video Calling service to be linked with the availability and configuration settings for Wi-Fi (Voice) Calling.**

R11-4-1 The support of Wi-Fi Video Calling shall be linked with the availability and configuration settings for Wi-Fi (Voice) Calling as defined in 'Green Button Promise for Voice', section US10-4.

US11-5 **As a user, I (i.e. user A) want to know if I can video call user B.**

R11-5-1 The IP Video Call service shall follow procedures described in chapter 2.3, Capability Discovery and Service Availability.

R11-5-2 In case the A-Party device does not provide a camera (hardware limitation), the IP Video Call capability is not available.

US11-6 **As a user receiving an incoming IP video call, I (i.e. user B) want to decide whether to:**

a) Decline the call which leads to an "unanswered video call" indication to the calling party (i.e. user A), or

b) Accept the call with transmitting my camera view.

R11-6-1 The receiver shall be able to accept or decline an incoming IP Video Call.

R11-6-2 When an IP video call is accepted, the audio part should be played either via a connected headset (if connected) or via the external loudspeaker (if no headset connected).

R11-6-3 A device shall not distinguish the ringtone to indicate the enabling IP Video Call service.

US11-7 **As a user receiving an incoming IP Video Call, I (i.e. user B) want to have the incoming video call differentiated from an incoming voice call.**

R11-7-1 The incoming call screen shall show to the user that the incoming call is a video call.

R11-7-2 Default ringtone for incoming IP Video Calls shall be as same as for voice calls, but the user shall be allowed to differentiate the ringtone for an incoming IP Video Call from an incoming voice call.

US11-8 **As a user in an IP Video Call, I want my video call to continue in case of connectivity change.**

R11-8-1 If connectivity changes from LTE to non-LTE (i.e. still on cellular connectivity) and thus IP video call continuity cannot be maintained, the call shall continue as Voice Call while the user under changing connectivity should be offered to manually start a "live video" share if available.

NOTE 1: Existing flows for initiating and accepting "live video" shall be followed as specified in section 2.12.4.2, Enriched Calling.

NOTE 2: When downgrading IP Video Call to a Voice Call all Voice Call requirements are applicable as described in section 2.10, Green Button Promise for Voice.

NOTE 3: If it is not possible to continue the call as (a) IP Video Call or as (b) voice call, the entire call drops.

R11-8-2 The terminal shall support video call continuity from Wi-Fi to LTE and vice versa where LTE coverage is available.

US11-9 **As a service provider, I want the best possible quality of video available to the user throughout the IP Video Call for the radio bearer the user is on.**

R11-9-1 An IP Video Call shall be delivered at the highest video quality that the radio bearer allows.

R11-9-2 The quality of the IP Video Call shall be adapted to the currently available bandwidth (e.g. by changing radio conditions) and use bitrates lower than the maximum negotiated when the IP Video Call was initiated.

R11-9-3 If technically possible, the quality of the IP Video Call shall be adapted to the currently available bandwidth and use bitrates higher than the rate negotiated when the IP Video Call was initiated.

US11-10 **As a user in an IP video call with insufficient bandwidth, I want to be made aware of when the video stream is interrupted until bandwidth is improved and the video transmission is continued.**

R11-10-1 When connectivity during an IP Video Call is insufficient to deliver a decent video stream, the video stream displayed to the user shall be interrupted and a visual indication shall be provided that connectivity is insufficient and the video continues when connectivity conditions are improved.

NOTE 1: Preferably a visual icon is used instead of an "error message".

NOTE 2: The criteria to decide whether the video quality is acceptable is left to the implementation.

US11-11 **As users in an IP video call, we want to stop (and restart) transmitting the own camera view at any point during the call without interrupting the call, i.e. audio is maintained during the call.**

R11-11-1 Each user in an IP video call shall be able to stop (and restart) transmitting their own live video at any point during the call.

R11-11-2 If a user stops sharing the own camera view, an in-call screen shall be displayed clearly indicating how the user can share their camera again.

R11-11-3 Stopping the transfer of the camera view by one or even by both users shall not interrupt the transmission of audio, so that the call continues as voice call.

US11-12 **As users in an IP video call, we want to mute (and unmute) the own voice (i.e. mute microphone) at any point during the call without interrupting the call, i.e. video is maintained during the call.**

R11-12-1 Each user in an IP Video Call shall be able to mute (and unmute) their own live audio at any point during the call.

US11-13 **As users in an IP video call, when we rotate (i.e. user A / B) our devices the correct video orientation is displayed based on the orientation of each device.**

R11-13-1 The device shall handle the different orientation permutations depending on how the device is rotated during an IP Video Call.

US11-14 **As users in an IP video call, we (i.e. user A / B) want to toggle between front and rear camera without interruption when the device supports two cameras.**

R11-14-1 The user shall be able to toggle the camera (i.e. front / back) which is recording the transmitted IP video signal if the device supports two cameras.

R11-14-2 If the device supports two cameras, the front facing camera shall be activated by default when the video transmission is started.

US11-15 **As a user, I want to know which connection (Cellular or Wi-Fi) is used for the IP Video Call.**

R11-15-1 The device shall inform the user in a non-intrusive way (e.g. similar to the network indicator in the notification bar or in the in-call screen) that the Wi-Fi connection is used or going to be used for any potential outgoing or incoming IP Video Call.

R11-15-2 During an on-going IP Video Call over Wi-Fi an indication of the connection quality should be displayed to indicate any potential impact of a poor Wi-Fi connection causing poor video call quality.

NOTE: The criteria to decide whether the video quality is acceptable is left to the implementation.

US11-16 **As a Service Provider, I may want to allow supplementary services during IP Video Calls like Calling Line Identification Presentation (CLIP), Call Waiting (CW), Call Hold, Call Forward Busy (CFB), Call Forward Unreachable, and Call Forward No Reply.**

R11-16-1 Supplementary Services like Calling Line Identification Presentation (CLIP), Call Waiting (CW), Call Hold, Call Forward Busy (CFB), Call Forward Unreachable, and Call Forward No Reply may be offered by a service provider during an IP Video Call.

US11-17 **As a user, I want to see my (initiated and received) IP video calls in my call logs similar to any other voice call.**

R11-17-1 The IP Video Call must be displayed in the single (voice AND video) call log interface (per contact or global call log).

R11-17-2 In that single log of the user's device, an IP Video Call shall be differentiated with a specific visual reference from a standard voice call and/or from an enriched voice call (i.e. with content sharing that has taken place during the call).

R11-17-3 Similar to voice call events, initial video call events (i.e. not added in-call) shall be differentiated between answered and unanswered video calls.

R11-17-4 The B-Party shall be informed of any video calls they has missed. The notification shall clearly show that the missed call is an IP Video Call.

R11-17-5 The visual indication of an IP Video Call in the call logs shall be the same for all IP Video Calls independently of the video call service that was used.

2.11.3 Technical Information

2.11.3.1 Overview

The IP Video Call service shall be realised based on three main technical enablers:

- Video over LTE (IR.94 conversational video) technical enabler as defined in [PRD-IR.94],

- Video over EPC-integrated Wi-Fi (IR.51 conversational video) technical enabler as defined in [PRD-IR.51], and
- RCS IP Video Call service as described in section 3.9 of [RCS6.0].

The three technical enablers shall co-exist based on procedures defined in section 3.9 of [RCS6.0].

The RCS IP Video Call service can be used only when the establishment of end to end IR.94/IR.51 conversational video service is not possible.

The three technical enablers for conversational video services shall interact based on the following definitions:

- Capability discovery: If the result of the exchange is that IR.94/IR.51 Conversational Video is supported in one end and RCS IP Video Call is supported in the other, the IP Video Call shall be available to both ends.
- Service initiation and acceptance: A IR.94/IR.51 Conversational Video-only device shall accept an incoming SIP INVITE for RCS IP Video Call as a SIP INVITE for IR.94/IR.51 Conversational Video and vice-versa as the services are compatible.

2.11.3.2 Technical Implementation of User Stories and Service Requirements

R11-18-1 Requirement R11-1-1 shall be implemented locally on the device based on the technical enablers described in section 2.11.3.1 of this document.

R11-18-2 Requirement R11-1-2 is fulfilled based on used technical enablers (as per section 2.11.3.1 of this document).

R11-18-3 Requirement R11-1-3 is fulfilled based on the used technical enablers for video (as per section 2.11.3.1 of this document).

R11-18-4 Requirements R11-1-4 and R11-1-5 shall be implemented locally on the device.

R11-18-5 For requirement R11-2-1, IR.94 conversational video service is only available under LTE coverage where that service is deployed. IR.94 conversational video service is enabled/disabled by configuring the PROVIDE IR94 VIDEO parameter defined in Annex A.1.12 of [RCS6.0]. RCS IP Video call is available in cellular access if Voice over LTE/Voice over Wi-Fi is not enabled on the device. The service provider is able to configure the availability of RCS IP Video call in this case via the parameter PROVIDE RCS IP VIDEO CALL defined in Annex A.1.12 of [RCS6.0].

R11-18-6 The realisation for requirement R11-3-1 is covered in section 2.11.3.1 of this document.

R11-18-7 Requirement R11-4-1 is fulfilled based on the PROVIDE IR51 VIDEO parameter defined in Annex A.1.12 of [RCS6.0].

R11-18-8 For requirement R11-5-1 section 2.3.3 of this document shall apply.

R11-18-9 Requirement R11-5-2 shall be implemented locally on the device. In this case the IR.94/IR.51 conversational video services and the RCS IP video call service shall not be advertised by the client through the SIP OPTIONS exchange mechanism.

R11-18-10 Requirement R11-6-1 shall be implemented locally on the device. For IR.94/IR/51 conversational video service section 2.2.2 of [PRD IR.94] shall be considered. For RCS IP Video call service section 3.9.4 of [RCS6.0] shall be considered.

R11-18-11 Requirements R11-6-2 and R11-6-3 shall be implemented locally on the device.

R11-18-12 Requirements R11-7-1 and R11-7-2 shall be implemented locally on the device.

R11-18-13 For requirement R11-8-1 Annex A.3.2 of [NG.102] shall apply. RCS Video Share service initiation for the case that IP Video call continuity cannot be maintained shall be implemented locally on the device. There is no service continuity for RCS IP Video call on connectivity change.

R11-18-14 For requirement R11-8-2, section 2.18 of [NG.102] shall apply.

R11-18-15 Requirement R11-9-1 shall be fulfilled based on section 3 of [PRD-IR.94], 2.4 and 3 of [PRD-IR.51] and 3.9.4.1 of [RCS6.0].

R11-18-16 For requirement R11-9-2, for IR.94/IR.51 conversational video service section 3.3 of [PRD-IR.94] shall apply. For RCS IP video call section 3.9.4.1 of [RCS6.0] shall apply.

R11-18-17 For R11-9-3, technical procedures are not defined.

R11-18-18 Requirement R11-10-1 shall be implemented locally on the device.

R11-18-19 The user story US11-11 is not applicable for RCS IP Video call in accordance with the definitions in section 3.9.4.1 of [RCS6.0]. For IR.94/IR.51 conversational video services the following applies:

R11-18-20 Requirements R11-11-1 and R11-11-3 shall be implemented locally on the device. For IR.94 conversational video, it shall be fulfilled based on section 2.2.2 of [PRD-IR.94]. For IR.51 conversational video, proceed as described in section 2.2.4 of [PRD-IR.51].

R11-18-21 Requirement R11-11-2 shall be implemented locally on the device.

R11-18-22 Requirement R11-12-1 shall be implemented locally on the device.

R11-18-23 For requirement R11-13-1, for IR.94 conversational video section 2.4.2 of [PRD-IR.94] shall apply. For IR.51 conversational video service, section 2.4.4 of [PRD-IR.51] shall apply. For RCS IP Video Call section 3.9.4.1 of [RCS6.0] applies.

R11-18-24 Requirements R11-14-1 and R11-14-2 shall be implemented locally on the device.

R11-18-25 Requirements R11-15-1 and R11-15-2 shall be implemented locally on the device.

R11-18-26 For requirement R11-16-1 section 2.3 of [PRD-IR.94] shall be taken into consideration for Video over LTE and EPC-integrated Wi-Fi. For RCS IP Video call section 3.9.4.1 of [RCS6.0] shall be taken into consideration.

R11-18-27 Requirements R11-17-1, R11-17-2, R11-17-3, R11-17-4 and R11-17-5 shall be implemented locally on the device.

2.11.3.3 Backward compatibility

Blackbird and CPR networks will not provide the parameters PROVIDE IR94, PROVIDE RCS IP VIDEO CALL and PROVIDE IR51 VIDEO in the configuration document.

Having the PROVIDE IP VIDEO CALL parameter not present, the client shall consider the RCS IP Video call service is disabled.

2.12 Enriched Calling

2.12.1 Description

Enriched Voice Calling service evolves the current voice call experience throughout all phases of a voice call: before, during and after the voice call.

Enriched Calling covers the following functional areas:

- **Pre-call experience**: Enrichment of the voice call before the voice call is started. A calling user can “compose” and share content that the called party sees when receiving the voice call.
- **In-call experience**: Enrichment of the voice call during the voice call. Either party can share content during a voice call.
- **Post call experience**: Enrichment in case a voice call could not be connected. A calling party can “compose” additional information that will be included with the missed call information on called party’s device when a call remains unanswered.

All these features are to be provided in conjunction with the Telco’s voice reliable bearers as described in “Green Button Promise for Voice” section 2.10 of this document.

2.12.2 User Stories and Feature Requirements for the Enriched Pre-call experience

This section describes the requirements for the Pre-call Call Composer. For all user stories and requirements listed below, it is assumed that the A-Party is Enriched Calling enabled and online (unless otherwise specified). It is acknowledged that the detailed UX design will vary across implementations. The Enriched Calling UI should conform to the native device design approach to present a consistent experience to users.

US12-1 **As a user (A-Party), I want to be able to place a voice call without the need for sharing pre-call content.**

R12-1-1 All voice call entry points remain the same (i.e. no additional enriched voice calling content sharing steps are required to make a voice call).

US12-2 **As a user (B-Party), I want to receive and immediately accept or reject voice calls when Pre-Call content is available.**

R12-2-1 The incoming voice call entry point remain the same (i.e. no additional enriched voice calling content sharing steps are required) to accept or reject any incoming call with a single selection, irrespective of any pre-call content being available on the incoming call screen.

US12-3 **As a user (A-Party), I want to provide the B-Party with additional enriched voice calling content.**

R12-3-1 The A-Party shall have the option to provide Pre-call content with the B-Party.

R12-3-2 The sharing of Pre-call content shall only be available for 1-to-1 voice calls.

R12-3-3 The sharing of Pre-call content shall not be available for IP Video calls.

R12-3-4 For available Enriched Calling capable contacts, an additional service entry point for the Pre-call services shall be provided on the same screen wherever entry points for voice calling exist. At a minimum this shall exist in the following places:

R12-3-4-1 The dialler for Enriched Calling capable contacts stored in the address book

R12-3-4-2 The dialler when entering an Enriched Calling capable new number

R12-3-4-3 The address book (e.g. contact card, quick contact view)

R12-3-4-4 The call log

R12-3-4-5 The 1-to-1 messaging conversation view

R12-3-5 The following Pre-call content share shall be supported:

R12-3-5-1 Important Call Indicator: an indicator that identifies to the B-Party that the voice call is highly important to be answered

R12-3-5-2 Pre-call Subject: a message defined by the A-Party, either entered as free text (limited to 60 characters), or selected from a list of pre-defined subjects

NOTE: Emotions and Emojis (as defined in Annex A.2 and A.3 of this document) are supported in the Pre-call Subject.

R12-3-5-3 Pre-call Image: an existing image selected from the device gallery, or a new picture taken with the device camera

R12-3-5-4 Pre-call Location: the current Location of the A-Party

NOTE: The A-Party location is sent as co-ordinates (latitude and longitude), and it is up to the B-Party device to determine how to represent these co-ordinates (e.g. as location map and/or text).

R12-3-6 The A-Party should only be able to share Pre-call content if they have the Calling Line Identification Restriction (CLIR) supplementary service disabled. If CLIR is enabled when the user accesses, or attempts to access, the Call Composer, they should be notified (e.g. via a dialog) about the need to reveal their mobile number and, ideally, be provided with a one-click mechanism to disable the CLIR service.

NOTE: If Pre-call content is shared without conveying the A-Party's Calling Line Identification, the content is not displayed on B-party side.

R12-3-7 After selecting the Pre-call content, the A-Party shall be able to preview and remove or change the selected content before pressing the voice call button.

R12-3-8 The A-Party shall be able to edit the Pre-call Location before placing the voice call to a more accurate position in a geographical map or textual address location.

R12-3-9 The user shall have the option to edit the Pre-call Image before placing the call, incl. options to crop and rotate the image.

R12-3-10 The Pre-call Image shall be automatically re-sized to reflect a target file size of approx. 80KB.

R12-3-11 All Pre-call content selected by the A-Party when pressing the voice call button shall be shared with the B-Party.

R12-3-12 All Pre-call content should be displayed on the A-Party outgoing call screen after pressing the voice call button.

R12-3-13 After pressing the voice call button, the user shall only be able to toggle the Important Call Indicator.

US12-4 **As a user (B-Party), I want to view content for an incoming voice call before answering the voice call.**

R12-4-1 All content shared by the A-Party when the voice call button was pressed shall be presented to the B-Party on their incoming call screen.

NOTE: Pre-call content is also expected to be displayed if the device is in a 'locked screen' state.

R12-4-2 Any pre-call content shall not introduce any delay in the display of the incoming call screen on the B-Party device, nor on the B-Party's ability to accept or reject the call.

R12-4-3 Any pre-call content shall not obscure any important control or display elements on the B-Party incoming call screen, incl. accept and reject call buttons, or caller name and/ or number.

R12-4-4 If the B-Party is already engaged in any kind of call (voice call, enriched voice call, video call), and has the Call Waiting service enabled, an incoming voice call that includes the Important Call indicator shall have this indicator displayed on B-Party screen. The availability of other content (i.e. Pre-call Subject, Image, and/or Location) shall also be indicated. If applicable, the B-Party shall have the option to maximize the incoming call notification to view this additional content before accepting or rejecting the call.

NOTE: Standard call handling controls (accept, reject etc.) shall continue to be available in all states.

R12-4-5 The Important Call Indicator shall be represented graphically and/or textually, and may trigger a dedicated LED notification.

R12-4-6 The Important Call Indicator shall not cause the B-Party device to ring if the device has been set to silent mode.

R12-4-7 Pre-call Images shall be displayed on the B-Party incoming call screen in the same aspect ratio as the original image, and any automatic cropping of the image shall be avoided.

R12-4-8 If a missed call notification is triggered on the B-Party device, any rich content associated with this call shall be visible in this notification.

US12-5 **As a user (A-Party) having added an image into the Call Composer, I want to know whether or not the image has been fully delivered to the B-Party through an indication in my Call Composer screen, so that it can be displayed, when the phone starts ringing.**

R12-5-1 The B-Party device shall notify the A-Party device that a pre-call added image is already received even before the corresponding call has been initiated so that the A-Party can see a (visual or textual) indication of the delivery.

NOTE 1: The A-Party can always start the call even without having received this pre-call image delivery indication.

NOTE 2: In general there is no guarantee that the content is displayed on B-Party side, e.g. in case CLIR is enabled.

US12-6 **As a user (A-Party), I want to have the device to remember my input into the Call Composer screen so that I find these contents still pre-populated when I happen to leave the Call Composer screen and go back while I am still in the same context.**

R12-6-1 If the user leaves the Call Composer screen (either by pressing the back button or by putting the screen into the background) the device shall cache any already added pre-call content and pre-populate this content if the user opens the Call Composer screen for that contact again within the timeframe of 1 hour. In this case, the user shall be able to edit the pre-call content, as per R12-3-7.

US12-7 **As a user (A-Party), I want to be able to select a pre-defined subject when adding a Pre-call Subject.**

R12-7-1 Pre-defined Pre-call Subjects should be available for the user.

R12-7-2 The implementation of pre-defined Pre-call Subjects on the device may offer some or all of the following features:

- The device may store and display previously entered user-defined Pre-call Subjects.
- An auto-complete function may be available that lists matching existing Pre-call Subjects while the user is typing.
- The user may be able to select a Pre-call Subject from a list of pre-defined and/or previously used subjects.
- The user should have an ability to edit any pre-defined or previously entered and stored Pre-call Subjects.

US12-8 **As a user (B-Party), I want to be able to maximise the incoming call screen, when it is minimized, to see any Pre-call content.**

R12-8-1 Even if the B-Party incoming voice call indication is minimised, the Important Call Indicator shall still be visible without the user having to expand the notification.

R12-8-2 If the B-Party incoming voice call indication is minimised, an indication of the availability of other content (i.e. Pre-call Subject, Image, and/or Location) shall be provided. The B-Party shall have the option to maximize the incoming call indication to view this additional content before accepting or rejecting the voice call.

US12-9 **As a user (A-Party and B-Party), while in a call, I want to see Pre-call content on my in-call screen, if no other content (e.g. via In-call Services) has replaced this Pre-call Content during the call.**

R12-9-1 Any Pre-call Image and/or Location shared by the A-Party shall be visible on both the A-Party and B-Party in-call screens, unless replaced by other content during the call.

NOTE: The displayed Location may appear differently on A- and B-Party device.

2.12.3 Technical Information for the Enriched Pre-call experience

2.12.3.1 Overview

The Pre-call experience is implemented by the Call composer service, described in section 2.4 of [RCC.20].

[RCC.20] is applicable for the implementation of Enriched Pre-call experience with the following updates:

- In section 2.1 of [RCC.20] the references to section 2.3.3.2 of RCC.07 is replaced by references to section 2.3.3.2 of the version of [RCC.07] referred to in this profile.
- The configuration parameters of [RCC.20] are implemented as defined in Annex B.
- In section 2.1.2.1 of [RCC.20] the configuration parameters are implemented as defined in Annex B.
- In section 2.2 of [RCC.20] the reference to section 2.6.1 of RCC.07 is replaced by references to section 2.6.1 of the version of [RCC.07] referred to in this profile.
- In section 2.4.2 of [RCC.20] the references to section 3.5.4.8.3.1 and 3.5.4.8.3.1.1 of RCC.07 are replaced by references to section 3.5.4.8.3.1 and 3.5.4.8.3.1.1 of the version of [RCC.07] referred to in this profile.
- In section 2.4.5 of [RCC.20] the references to section 3.5.4.8.3.2 and 3.5.4.8.6.4 of RCC.07 are replaced by references to section 3.5.4.8.3.2 and 3.5.4.8.6.4 of the version of [RCC.07] referred to in this profile.

2.12.3.2 Technical Implementation of User Stories and Service Requirements

R12-10-1 Requirements R12-1-1, R12-2-1, R12-3-1, R12-3-2, R12-3-3, R12-3-4-1 to R12-3-4-5, R12-3-5-1 to R12-3-5-4 shall be implemented locally on the device. In addition client configuration and capability discovery as described in section 2.1 and 2.2 of [RCC.20] shall be supported.

R12-10-2 Requirement R12-3-6 shall be implemented locally on the device. In addition the device needs to support the ability to check the status of network based supplementary services.

R12-10-3 Requirements R12-3-7, R12-3-8, R12-3-9 and R12-3-10 shall be implemented locally on the device. In addition the call composer procedures as described in section 2.4 of [RCC.20] shall be supported.

R12-10-4 Requirement R12-3-11 shall be implemented as described in section 2.4 of [RCC.20].

R12-10-5 Requirement R12-3-12 and R12-3-13 shall be implemented locally on the device.

R12-10-6 Requirements R12-4-1 and R12-4-2 shall be implemented as described in section 2.4 of [RCC.20].

R12-10-7 Requirements R12-4-3 and R12-4-4 shall be implemented locally on the device.

R12-10-8 Requirements R12-4-5, R12-4-6, R12-4-7, R12-4-8 shall be implemented locally on the device. In addition the call composer procedures as described in section 2.4 of [RCC.20] shall be supported.

R12-10-9 Requirement R12-5-1 shall be implemented as described in section 2.4.6 of [RCC.20].

R12-10-10 Requirements R12-6-1, R12-7-1, R12-7-2, R12-8-1, R12-8-2 and R12-9-1 shall be implemented locally on the device.

2.12.3.3 Backward Compatibility

CPR networks will provide the parameter COMPOSER AUTH and may provide the CALL COMPOSER TIMER IDLE parameter

Blackbird networks will not provide the parameters COMPOSER AUTH and CALL COMPOSER TIMER IDLE. Having the COMPOSER AUTH parameter not present the client shall consider the call composer service is disabled.

2.12.4 User Stories and Feature Requirements for the Enriched In-call experience

2.12.4.1 General Requirements

US12-11 **As a user during a voice call, I want to use enhanced functionality that allows me to have a more meaningful and engaging (i.e. "richer") conversation with the person I am on the call with.**

R12-11-1 All In-call Services shall be made accessible from the In-call screen which is by definition only shown during an on-going call.

R12-11-2 All services shall only be delivered in a 1-to-1 voice call.

R12-11-3 All services shall be supported independently of the enabling operator voice service (e.g. CS / VoLTE / Wi-Fi Calling).

R12-11-4 Once a call is connected and a capability refresh has detected the end-to-end availability of In-call Services a non-intrusive (in volume and character of the sound) audio notification should be played to the user to indicate the availability of In-call Services. The audio notification shall be different in character of the sound compared to any audio notification indicating incoming requests for In-call Services events.

R12-11-5 When either participant of the call places the call "On Hold", any entry point to the "live video" shall be disabled.

2.12.4.2 "Live Video"

"Live Video" will offer to users the experience to add their camera view to an ongoing voice call across different bearers triggered by a single button to "add video". This section describes the User Stories and Service Requirements for the "Live Video" services.

US12-12 **As a user in a voice call, I (i.e. A-Party) want to have the ability to share my "live video" (i.e. the camera view) from my in-call screen with the other participant of the call (i.e. B-Party) whenever it is possible. While sharing, the video is delivered as a real-time stream to the receiver's screen, the sound is still delivered via the ongoing Voice Call.**

R12-12-1 During an ongoing voice call there shall be the option for both users to share "live video" with the other party if a "live video" share is supported end-to-end.

NOTE: The transmitted Video Share cannot be recorded by any user.

R12-12-2 The entry point to add "live video" to an ongoing voice call shall be a single button independent of the enabling "live video" service.

R12-12-3 If a "live video" share is added during an ongoing voice call, the voice call shall continue with no degradation of the reliability of the voice call.

R12-12-4 If “live video” can be delivered by multiple technical enablers, the one that provides a lip sync experience shall prevail.

R12-12-5 Sending “live video” shall only be made available in case Wi-Fi, HSPA or higher data connectivity is given.

R12-12-6 If the user is connected for data only on 3G, “live video” shall only be made available for receiving.

R12-12-7 If data connectivity of one user is less than 3G (and Wi-Fi not available), “live video” shall not be made available to both users.

R12-12-8 If the underlying voice call is terminated, the “live video” share shall be terminated as well.

R12-12-9 The user shall not be able to record the transmitted “live video” share (i.e. both receiving and sending “live video”).

R12-12-10 There shall be no option to stream a previously recorded video to the other conversation party.

US12-13 **As a user, when receiving a “share live video” request, I (i.e. B-Party) want to decide whether to:**

a) Decline the incoming “live video” request and continue with a plain voice call, or
b) Accept the incoming “live video” request and sending my camera view.

R12-13-1 The receiver (B-Party) shall be able to accept or reject an incoming “live video” request.

R12-13-2 In case the receiver rejects an incoming “live video” request, the voice call shall continue.

R12-13-3 The receiver (B-Party) shall not be able to also add “live video” from their side in case any of the two parties (i.e. A / B-Party) is on 3G only.

R12-13-4 The sender (A-Party) shall be notified accordingly about the selection of the receiver (B-Party) i.e. accepting or rejecting the “live video” service.

R12-13-5 If the receiver sends back a “live video” then the stream shall be shown directly on the originator’s device without options to accept or reject.

R12-13-6 Upon acceptance of the A-Party’s “live video” stream, the camera view shall be streamed to the receiver (B-Party) and displayed on the receiver’s screen.

R12-13-7 An audio signal played on the recipient’s (i.e. B-Party) side should accompany any reception of an incoming “live video” request.

US12-14 **As a user accepting an incoming “live video” request, I (i.e. B-Party) want the incoming voice automatically on a connected headset. If there is no headset connected, then play the voice on my external loudspeaker.**

R12-14-1 When an incoming “live video” is accepted, the audio part should be played either via a connected headset (if connected) or via the external loudspeaker (if no headset connected).

US12-15 **As a user sharing “live video”, when I rotate (i.e. A / B-Party) my device the correct video orientation is displayed on both ends.**

R12-15-1 The device shall handle the different orientation permutations depending on how the device is rotated during a “live video” to always show the incoming video in the right orientation (e.g. not upside down).

US12-16 **As a user sharing "live video" from my camera, I (i.e. A / B-Party) want to toggle between front and rear camera and upon selection video is changed without interruption (if the device supports two cameras).**

R12-16-1 The user shall be able to toggle the camera (i.e. front / back) which is recording the transmitted live stream given the device supports two cameras.

R12-16-2 If the device supports two cameras, the front camera shall be active by default for transmission of the "live video".

US12-17 **As a user sharing "live video", I (i.e. A / B-Party) want to stop sharing video at any point during the call without interrupting the underlying voice call.**

R12-17-1 A user shall be able to terminate either its own or complete "live video" at any point during the call (i.e. two options (1) to stop own, (2) to stop the complete "live video") without degradation of the reliability of the underlying voice call.

NOTE: This is an explicit stop of the transmission not a "hiding" of video while the actual stream continues.

US12-18 **As users sharing "live video" (both one and two-way), we want the best possible quality of video available to us throughout the "live video" share for the bearer we use.**

R12-18-1 A "live video" share over LTE shall benefit from a higher video quality than available on 3G.

R12-18-2 A "live video" share over Wi-Fi shall benefit from a higher video quality than available on 3G.

R12-18-3 The quality of the "live video" stream shall be adapted to the currently available bandwidth (e.g. by changing radio conditions) and use bitrates lower that the maximum negotiated when the "live video" was initiated.

R12-18-4 If technically possible, the quality of the "live video" stream shall be adapted to the currently available bandwidth and use bitrates higher than the rate negotiated when the "live video" was initiated.

US12-19 **As a user sharing "live video", I want my "live video" stream to continue in case of connectivity changes.**

R12-19-1 The terminal shall support continuity of the "live video" stream in a seamless manner when network conditions allow.

R12-19-2 In the special event where a "live video" stream cannot be maintained in a seamless manner, the call shall continue as Voice Call while the user under changing connectivity should be offered to manually (re-)start a "live video" share if available.

R12-19-3 In case a "live video" stream cannot be maintained or re-established, the underlying voice call shall continue.

US12-20 **As a user, I want to see (in my call logs) an indication if a "live video" share initiated by me or the other party during the call event.**

R12-20-1 Both A-Party and B-Party call logs should identify that a "live video" event occurred during the call.

R12-20-2 Live video content shared during a call is not stored or accessible after the call for either party.

2.12.4.3 Image Share

Image Share is a service that allows sending a picture (either stored in a user's device or taken for the purpose) while in a voice call with a contact. The service differs from File Transfer only in terms of user experience and interface. Sharing during a call, given the real time context, is an immediate task with minimal user interaction displaying the shared content within (or on top) of the calling screen. Devices complying with these requirements will only be able to receive legacy Image Share requests.

US12-21 **As a user, when receiving an image share request, I (i.e. B-Party) want to decide whether to:**

a) Decline the incoming image share request and continue with a plain voice call,
b) Accept the incoming image share request.

R12-21-1 The receiver shall be able to accept or reject an incoming image share (no auto-accept). The sender shall be notified accordingly about the selection of the receiver.

R12-21-2 Upon acceptance the picture is transferred to the receiver.

R12-21-3 Once the transfer of the image is completed the received picture shall be displayed with minimal user interaction on the receiver's screen.

R12-21-4 When the underlying call is terminated for any reason, the image share shall stop and the receiver may no longer have access to the image.

R12-21-5 An audio signal played on the recipient's side should accompany any reception of an incoming image share request.

US12-22 **As a user accepting an incoming image share, I (i.e. B-Party) want the incoming audio automatically sent to a connected headset. If there is no headset connected, then I want the audio to be sent to my external loudspeaker.**

R12-22-1 When an incoming image share is accepted, the audio call should be played either via a connected headset (if connected) or via the external loudspeaker (if no headset connected).

R12-22-2 While the image is displayed it shall be made easy for the user to use the standard in-call features (i.e. toggle loudspeaker, mute, etc.).

US12-23 **As a user, I want to see an indication in my call logs that an Image Share occurred during a voice call.**

R12-23-1 Call logs should identify that an Image Share event occurred during the call (independent which party initiated the Image Share).

NOTE: Images shared during a call using Image Share are not stored or accessible after the call for either party in their call log / message thread.

2.12.4.4 Share any file during call

The functionality to share any file during a call is based on File Transfer that happens usually within the context of messaging. Sharing during a call happens within the context and user flows of the on-going voice call.

US12-24 **As a user in a voice call, I (i.e. A / B-Party) want to access on my In-call screen the option to share any file with the other participant of the call (i.e. B-Party).**

R12-24-1 File Transfer shall be possible during an on-going voice call while the call shall continue seamlessly on the same bearer.

NOTE 1: This includes the case where other In-call Services are also in progress.

NOTE 2: The transmission of “live video” needs to be stopped by the user to initiate / accept an incoming file share.

R12-24-2 When sharing files with the other participant of the call, the same logic as defined in Operator Messaging, see section 2.4 and File Transfer, section 2.7 shall apply.

R12-24-3 Accessing the option to share a file with the other participant of the call shall be possible from the in-call screen without ending the call.

NOTE: This includes the case where other In-call services are also in progress.

R12-24-4 The support of file types and file sizes shall follow the behaviour described in R7-3-1.

R12-24-5 It shall be possible to resize images as described in R7-6-1.

R12-24-5-1 Pictures shall be optimised and resized to facilitate a faster transfer experience during a call (i.e. ‘low file size’ as default selection)

R12-24-6 It shall be possible to resize videos as described R7-7-1.

R12-24-7 An on-going File Transfer shall be completed even if the call was terminated. After completion a notification shall be displayed that the file is now accessible via the call logs or the Messaging conversation view.

R12-24-8 Any file shared during a call (with the other participant of the call) shall be accessible from the in-call screen for the duration of the on-going call (or until replaced by other incoming content). The file or a preview of the file shall be displayed on the in-call screen if the sending device supports the display of that file type. If display/preview of that specific file type is not supported a placeholder indicating the file name and type shall be displayed.

R12-24-9 For photos at minimum the jpeg format shall be supported for display. Other formats may be supported for display (e.g. gif, png).

R12-24-10 While a shared file is displayed during an ongoing call the user shall have easy access to standard in-call features (i.e. toggle loudspeaker, mute, etc.).

R12-24-11 It shall be possible to open a full screen file viewer application from the displayed file / preview of the file for further user interaction with the file (e.g. save, edit, share etc.).

2.12.4.5 Exchanging messages

Exchanging messages during a call is based on the available messaging functionality but is a simple way to share “something written” in an on-going voice call situation. This experience is especially meant to offer the option to the calling parties to exchange or confirm something in written format (e.g. a name, an address, a number etc.).

US12-25 **As a user while in a voice call, I (i.e. A / B-Party) want to access on my In-call screen the option to exchange messages with another user (not necessarily the other call party).**

R12-25-1 Sending and receiving messages from/to any other RCS enabled user shall be possible during an on-going voice call while the call shall continue seamlessly on the same bearer.

NOTE: This includes the case where other In-call Services are also in progress.

R12-25-2 When sending messages the RCS application shall follow the logic as defined in Operator Messaging, section 2.4.

R12-25-3 Accessing messaging with the other participant of the call shall be possible directly from the in-call screen without ending the call.

R12-25-4 An audio signal played on the recipient's side should accompany any reception of an incoming message from the other calling party.

NOTE: Standard notifications behaviours for new messages from other parties (not on current call) are unaffected.

R12-25-5 Messages received from the other participant of the call shall be clearly displayed within the in-call screen and accessible for the duration of the on-going call (or until replaced by other incoming content).

NOTE: If the in-call screen is not the foreground view on the device, the user will receive a notification that takes him to the according screen to view the message.

R12-25-6 It should be easy to reply to such message without leaving the screen displaying the received message.

R12-25-7 While an exchanged message is displayed during an ongoing call the user shall have easy access to standard in-call features (i.e. toggle loudspeaker, mute, etc.).

R12-25-8 Any messages exchanged during a call shall be available to the user after the call similar to the experience of Messaging outside a call as defined in Operator Messaging, section 2.4.

2.12.4.6 Location Push

Location Push as In-call Service describes the functionality to allow sending a location or position to the other contact while in a call.

US12-26 **As a user while in a voice call, I (i.e. A / B-Party) want to access on my In-call screen the option to send and receive "my/a user's location" or a generic "position" from/to the other participant of the call (B-Party).**

R12-26-1 Location Push shall be possible during an on-going voice call while the call shall continue seamlessly on the same bearer.

R12-26-2 Accessing the selection and sending of Location Push to the other participant of the call shall be possible directly from the in-call screen without ending the call.

R12-26-3 Location Push received from the other participant of the call shall be automatically accepted (based on File Transfer configuration) by the B-Party.

R12-26-4 Once accepted and transferred the location or position shall be displayed on the B-Party's in-call screen as a map (pre-) view and / or the actual address of the location.

R12-26-5 An audio signal played on the recipient's side should accompany any reception of an incoming Location Push / Location Push request.

R12-26-6 Any Location Push sent and/or received during a call shall be accessible from the in-call screen for the duration of the on-going call (or until replaced by other incoming content).

NOTE: If the in-call screen is not the foreground view on the device, the user will receive a notification that takes him to the according screen to view the shared location.

R12-26-7 It shall be possible to open a full screen map viewer application from the displayed location for further user interaction with the map (e.g. zoom, move map view, find route).

2.12.4.7 Enriched Calling In-Call Sharing with Non-Enriched Calling enabled contacts

US12-27 **As a user, I want to use In-call Services even with contacts who are not are not Enriched Calling enabled.**

R12-27-1 When sharing files with the other participant of the call, the same logic as defined in 'Operator Messaging', section 2.4 and in 'File Transfer' section 2.7 shall apply when the B-Party is not Enriched Calling enabled.

R12-27-2 When sending a Location Push to the other participant of the call, the same logic as defined in US7-22 shall apply when the B-Party is not Enriched Calling enabled.

R12-27-3 When sending a message to the other participant of the call, the same logic as defined in 'Operator Messaging', section 2.4 shall apply when the B-Party is not Enriched Calling enabled.

NOTE: Experience limitations for incoming SMS while a different application is set as Default Messaging Application are noted, e.g. notifications by the Default Messaging Application cannot be avoided.

2.12.5 Technical Information for the Enriched In-call experience

2.12.5.1 Overview

Based on the requirements, the in-call services are constituted of the following main services:

- "Live Video": In line with the requirements in sections 2.10 and 2.11 of this document, in case the voice call is end to end IR.92/IR.51voice call and the video service is available, "Live" Video shall be implemented as an end to end IR.94/IR.51 conversational video call based on procedures described in [PRD-IR.94] and [PRD-IR.51]. In this case, the RCS Video Share service as described in section 2.7.1.2 and 3.6 of [RCC.07] shall not be available to the user. In any other case, RCS Video Share service shall be used.
  For the cases of IR.92/IR.51 voice interwork to legacy, RCS Video Share service is used. RCS Video Share service is possible to be established over LTE or EPC integrated Wi-Fi access.
- Image share (share a picture during a call): Implemented via the RCS Image Share service as described in section 3.6 of [RCC.07].
- Sharing any file during a call: Implemented via the RCS File Transfer service as described in section 3.5 of [RCC.07].

- Exchanging messages: Implemented via the services described in sections 2.4.3 and 2.5.3 of this document.

- Location Push: Implemented as described in section 3.10 of [RCC.07].

The client shall indicate support for the listed services based on Capability Exchange mechanism described in section 3 of [RCC.60].

NOTE: There is one exception to be considered; if the device is in a IR.92 / IR.51 voice call, the availability of the upgrade to video call (implemented through IR.94/IR.51 conversational video) shall rely on the contact header negotiation during the call establishment (SIP INVITE and response).

RCS sharing services outside a voice call covered in sections 3.6.1.3, 3.6.1.4.4, 3.6.2.2, 3.6.2.4, 3.6.4.1.2 and 3.6.6.2 of [RCC.07] are outside the scope and thus not applicable.

2.12.5.2 Technical Implementation of User Stories and Service Requirements

2.12.5.2.1 General Requirements

R12-28-1 Requirements R12-11-1 shall be implemented locally on the device.

R12-28-2 For requirement R12-11-2, section 3.6.2.1.1 of [RCC.07] shall be taken into consideration. The client shall initiate in call services while being in a one to one call.

R12-28-3 For requirement R12-11-3 section 2.12.5.1 of this document shall be taken into consideration. The in-call services that are supported for the different voice calling services shall be implemented locally on the device.

R12-28-4 Requirements R12-11-4 and R12-11-5 shall be implemented locally on the device.

2.12.5.2.2 Live Video

R12-28-5 Requirement R12-12-1 shall be implemented locally on the device based on clarifications provided in section 2.12.5.1 of this document.

R12-28-6 Requirement R12-12-2 shall be implemented locally on the device.

R12-28-7 For requirement R12-12-3, in case IR.94/IR.51 conversational video is added, section 2.4 of [PRD-IR.94] shall apply.

R12-28-8 Requirement R12-12-4 is in line with the service prioritisation described in section 2.12.5.1 of this document under the bullet of “Live Video”.

R12-28-9 For requirement R12-12-5, IR.94/IR.51 conversational video service is available only under E-UTRAN/EPC integrated Wi-Fi coverage. For the case of RCS Video Share, the PROVIDE VS parameter defined in Annex A.1.6 of [RCS5.3] shall be set accordingly.

R12-28-10 Requirement R12-12-6 is related to RCS Video Share service. Not initiating an RCS Video Share session while being under 3G coverage shall be implemented locally on the device. The PROVIDE VS parameter defined in Annex A.1.6 of [RCS5.3] shall be set accordingly so as to allow receiving video share service under 3G coverage.

R12-28-11 For requirement R12-12-7, section 2.7 of [RCS5.3] shall apply.

R12-28-12 For requirement R12-12-8, in case IR.94/IR.51 conversational video service is used, IR.92/IR.51 voice call termination will result to video service termination. For the case that video share service is used, as per section 3.6 of [RCC.07] the requirement is aligned with the service description.

R12-28-13 For requirements R12-12-9 and R12-12-10, for the RCS Video Share service and in order to prevent recording, the ALLOW VS SAVE parameter as defined in Annex A.1.6 of [RCS6.0] shall be set to zero.

R12-28-14 For requirements R12-13-1 and R12-13-2, for IR.94/IR.51 conversational video service section 2.2.2 of [PRD-IR.94] shall apply. For the RCS Video Share service section 3.6 of [RCC.07] shall apply.

R12-28-15 Requirement R12-13-3 is only relevant for the RCS Video Share service. Similar to requirements R12-12-6 and R12-12-7, not being able to send “live video” under 3G coverage shall be implemented locally on the device. The PROVIDE VS parameter defined in Annex A.1.6. of [RCS5.3] shall be set to a value that allows receiving video share service under 3G coverage.

R12-28-16 Requirement R12-13-4 shall be implemented locally on the device based on the SIP INVITE response.

R12-28-17 Requirements R12-13-5, R12-13-6 and R12-13-7 shall be implemented locally on the device.

R12-28-18 Requirement R12-14-1 shall be implemented locally on the device.

R12-28-19 For requirement R12-15-1, for IR.94 conversational video service section 2.4.2 of [PRD-IR.94] shall apply. For IR.51 conversational video service, section 2.4.4 of [PRD-IR.51] shall apply. For RCS Video Share service, it shall be implemented following the image orientation extension described in 2.7.1.2.2 of [RCC.07].

R12-28-20 Requirements R12-16-1 and R12-16-2 shall be implemented locally on the device.

R12-28-21 For requirement R12-17-1, the video service used shall be taken into consideration. For IR.94/IR.51 conversational video, section 2.2.2 of [PRD-IR.94] shall apply. For RCS Video Share service, procedures as described in sections 3.6.4.3.4 and 3.6.4.3.5 of [RCC.07] shall apply.

R12-28-22 For requirement R12-18-1, for IR.94 conversational video service section 3 and 4.2 of [PRD-IR.94] shall apply. For RCS Video Share service over LTE section 3.6.4.1.5 of [RCC.07] shall apply.

R12-28-23 For requirement R12-18-2, for IR.51 conversational video service section 3 of [PRD-IR.51] shall be considered.

R12-28-24 For requirement R12-19-1 handover procedures defined in [PRD-IR.51], [PRD-IR.92] and [PRD-IR.94] shall be taken into consideration. Change of connectivity conditions that result to service transition from IR.94/IR.51 conversational video service to RCS Video Share service or the opposite will result to service re-establishment. For change of connectivity conditions where RCS Video Share service remains the used service, sections 2.4.7 and 2.4.8 of [RCC.07] shall be taken into consideration.

R12-28-25 For requirement R12-19-2, RCS Video Share service initiation for the case that IP Video call continuity cannot be maintained shall be implemented locally on the device.

R12-28-26 For requirement R12-19-3, in case of IR.94/IR.51 conversational video service loss section 2.4 of [PRD-IR.94] shall apply.

R12-28-27 Requirement R12-20-1 shall be implemented locally on the device.

R12-28-28 For requirement R12-20-2, the ALLOW VS SAVE parameter defined in Annex A.1.6. of [RCS5.3] shall be set to zero.

2.12.5.2.3 Image Share

In order to support image share requests coming from legacy clients, image share capability shall be included in the capability exchange during an ongoing call. However, the absence of entry point for outgoing image share requests shall be implemented locally on the device.

R12-28-29 Requirements R12-21-1 and R12-21-2 are implemented as per section 2.12.5.1 of this document (image share bullet).

R12-28-30 Requirement R12-21-3 shall be implemented locally on the device.

R12-28-31 Requirement R12-21-4 for image access after the termination of the call, as per section 3.6.4.1.3 of [RCC.07] and given that the sender is a legacy client (i.e. ALLOW VS SAVE parameter as per Annex A.1.6. of [RCS5.3] is set to 0), the SDP attribute will not be included. The shared image during the call will not be recorded by the receiver.

R12-28-32 Requirement R12-21-5 shall be implemented locally on the device.

R12-28-33 Requirement R12-22-1 and R12-22-2 shall be implemented locally on the device.

R12-28-34 Requirement R12-23-1 shall be implemented locally on the device.

2.12.5.2.4 Share any file during call

R12-28-35 The realisation of requirement R12-24-1 shall be implemented as defined in section 2.12.5.1 of this document (sharing any file during a call bullet).

R12-28-36 Requirement R12-24-2 shall be implemented as defined in sections 2.4.3 and 2.7.3.

R12-28-37 Requirement R12-24-3 shall be implemented locally on the device. It is required for the client to be able to identify whether the file transfer is received from the other party in the call and if so to display the file transfer accordingly.

R12-28-38 Requirements R12-24-4, R12-24-5 and R12-24-6 shall follow the procedures described in section 2.7.3 of this document.

R12-28-39 Requirement R12-24-7 shall be implemented based on the procedures defined in section 2.12.5.1 of this document (sharing any file during a call bullet). The service continuation is not related to the status of the voice call. The display of the notification shall be implemented locally on the device.

R12-28-40 Requirements R12-24-8, R12-24-9, R12-24-10 and R12-24-11 shall be implemented locally on the device.

2.12.5.2.5 Exchanging messages

R12-28-41 Requirements R12-25-1 and R12-25-2 shall be implemented locally on the device. Sending and receiving of messages during the call shall follow the

same methods and procedures as described in sections 2.4.3 and 2.5.3 of this document

R12-28-42 Requirements R12-25-3, R12-25-4, R12-25-5, R12-25-6, R12-25-7 and R12-25-8 shall be implemented locally on the device.

2.12.5.2.6 Location push

R12-28-43 Requirement R12-26-1shall be implemented locally on the device. Sending and receiving of location push information during the call shall follow section 2.12.5.1 of this document (location push bullet).

R12-28-44 Requirement R12-26-2 shall be implemented locally on the device.

R12-28-45 The client's auto accept behaviour, defined in requirement R12-26-3 shall be implemented locally in the device and it shall be controlled via the FT AUT ACCEPT parameter defined in section A.1.4 of [RCC.07].

R12-28-46 Requirements R12-26-4 to R12-26-7 shall be implemented locally on the device.

2.12.5.2.7 Enriched Calling In-Call Sharing with Non-Enriched Calling enabled contacts

R12-28-47 Requirement R12-27-1 shall be implemented as defined in sections 2.4.3 and 2.7.3

R12-28-48 Requirement R12-27-3 shall be implemented as defined in sections 2.4.3 and 2.5.3.

2.12.5.2.8 Blackbird Clients

Blackbird clients shall be provisioned by Pre Universal profile networks with PROVIDE VS parameter based on Annex A.1.5 of [RCC.07] definition.

2.12.6 User Stories and Feature Requirements for Interactive In-call experience

Note in this section, the ‘A-Party’ requesting a live sketch sharing may be either the caller or the recipient of the ongoing voice call. Similarly the ‘B-Party’ receiving a request to a live sketch sharing may be either the caller or the call recipient.

2.12.6.1 Live Sketch Sharing

US12-29 **As a user (i.e. A / B-Party), I want to be able to participate in a live sketch sharing at any time during an on-going call.**

R12-29-1 Both parties shall be able to participate in a shared sketch at any time during an on-going 1-to-1 voice call.

NOTE 1: Applies even if other in-call services are also in progress.

NOTE 2: A “live video” needs to be stopped by the user to initiate or accept an incoming live sketch sharing request.

NOTE 3: Both parties may be prevented from initiating a new live sketch sharing if they are already participating in a live sketch sharing.

R12-29-2 The on-going voice call shall continue seamlessly on the same bearer when a live sketch sharing is in progress.

US12-30 **As a user (i.e. A-Party), I want to be able to invite the other calling party to share a sketch at any time during an on-going call.**

R12-30-1 During a voice call, either party shall be able to access a live sketch sharing request to the other party in the call directly from the in-call screen.

NOTE: As long as no other live sketch sharing is currently in progress.

R12-30-2 Either party shall not be able to request a live sketch sharing when the other party is not Enriched Calling enabled or if either party does not have data connectivity during the voice call.

R12-30-3 When either participant of the call puts the call On Hold, any entry point to Interactive In-call services shall be disabled.

US12-31 **As a user (i.e. A-Party) having requested the other party to a live sketch sharing, I want to see the status of the live sketch sharing request.**

R12-31-1 It shall be made clear to the A-Party that a request has been sent but is not yet accepted (or rejected).

R12-31-2 The A-Party shall be notified if the request to the live sketch sharing has timed out before B-Party accepts or rejects the request.

R12-31-3 The A-Party shall be notified if the request to the live sketch sharing was rejected by the B-Party.

NOTE: This includes either party going offline.

R12-31-4 The A-Party should be able to re-initiate the request to a live sketch sharing to the B-Party if the previous request failed for any reason, or if it timed out or if rejected by B-Party.

US12-32 **As a user (i.e. A-Party) having requested the other party to a live sketch sharing, I want to be able to cancel the request to a live sketch sharing before B-Party acceptance.**

R12-32-1 The A-Party should be able to cancel an initiated request to a live sketch sharing before the B-Party has accepted (or rejected) it.

R12-32-2 The B-Party shall be notified if the request to the live sketch sharing is cancelled by the A-Party before they have accepted (or rejected) it.

R12-32-3 The request to a live sketch sharing shall be cancelled automatically if the call ends before the B-Party has accepted (or rejected) it.

NOTE: No separate notification that the request to a live sketch sharing has been cancelled is required in this case.

US12-33 **As a user (A-Party) having requested the other party to a live sketch sharing, I want the request to time out if the B-Party fails to respond.**

R12-33-1 The request to a live sketch sharing should be automatically dismissed or declined if the B-Party has not accepted (or rejected) it after a pre-defined timeout period.

R12-33-2 Both parties shall be notified if the request to a live sketch sharing times out before the B-Party has accepted (or rejected) it.

US12-34 **As a user (i.e. B-Party) having been requested to a live sketch sharing, I want to be able to see the request to the live sketch sharing.**

R12-34-1 An incoming request to a live sketch sharing shall trigger an on-screen notification on the B-Party's device, which shall be visible to the B-Party whether the in-call screen is currently displayed on their device.

R12-34-2 B-Party can accept or reject a request to a live sketch sharing from A-Party.

R12-34-3 An audio signal played on the B-Party's device should accompany the incoming request to a live sketch sharing.

US12-35 **As a user (B-Party) having been requested to a live sketch sharing, I want to be able to accept the request to the live sketch sharing.**

R12-35-1 The B-Party shall be able to accept the live sketch sharing directly from the live sketch sharing request.

R12-35-2 When the B-Party accepts the request to the live sketch sharing, any live sketch content already created by the A-Party (e.g. pre-defined background, pre-share edits etc.) shall be transferred to their device, and the live sketch sharing shall start.

R12-35-3 When B-Party accepts the live sketch sharing both A- and B-Party's live sketch screen shall open automatically.

US12-36 **As a user (i.e. B-Party) having been requested to a live sketch sharing, I want to be able to decline the live sketch sharing.**

R12-36-1 The B-Party shall be able to decline the request to the live sketch sharing.

US12-37 **As a user (i.e. A / B-Party) in an on-going voice call with an ongoing live sketch sharing, I want to be able to edit the sketch.**

R12-37-1 During a live sketch sharing, both parties shall be able to edit the sketch, and view any edits they have made in real time.

R12-37-2 During a live sketch sharing, both parties shall be able to view any edits made to the sketch by the other party in as near real-time as possible.

R12-37-3 Editing a live sketch shall allow actions like changing the sketch background, drawing lines on the sketch background itself and changes to the drawings (e.g. changing line colour and line thickness, erasing lines etc.).

US12-38 **As a user (i.e. A / B-Party) in an on-going voice call with an ongoing live sketch sharing, I want to be able to move between the main in-call screen and the sketch screen at any time.**

R12-38-1 While a sketch is open, it shall be easy for the user to use the standard in-call features and controls (e.g. end call, toggle loudspeaker, mute, etc.) without ending the shared sketch session.

R12-38-2 Either party shall be able to switch directly between the sketch and the in-call screens at any time without ending the shared sketch session.

US12-39 **As a user (A-Party or B-Party) in an ongoing live sketch sharing during a voice call, I want the incoming voice automatically on a connected headset. If there is no headset connected, then play the voice on my external loudspeaker.**

R12-39-1 During an ongoing live sketch sharing, the audio part of the ongoing voice call should be played either via a connected headset (if connected) or via the external loudspeaker (if no headset connected).

US12-40 **As a user (i.e. A / B-Party) in an on-going voice call with an ongoing live sketch sharing, I want to be able to end the live sketch sharing at any time.**

R12-40-1 Either party shall be able to end the live sketch sharing at any time

R12-40-2 Either party shall be able to end the live sketch sharing directly from their live sketch screen.

R12-40-3 Either party may be able to end the live sketch sharing directly from their in-call screen.

R12-40-4 A confirmation dialog may be displayed if the user elects to end the live sketch sharing.

R12-40-5 Pressing the device back or home keys from the shared sketch screen should not end the live sketch sharing.

R12-40-6 The shared sketch session shall end automatically if the associated voice call ends.

US12-41 **As a user (i.e. A / B-Party) in an on-going voice call previously engaged in a live sketch sharing which has ended, I want to know why the sketch ended.**

R12-41-1 Both parties shall be made aware when the live sketch sharing has ended (e.g. via a toast message or other notification).

US12-42 **As a user engaged in a live sketch sharing, I want the final sketch to be saved on my device.**

R12-42-1 The sketch shall be automatically saved to both parties' devices when the session ends.

NOTE: Sketch may be saved as a 'flat' image, without separately editable background and drawing layers.

2.12.6.2 Specific Requirements for a live sketch on an image

US12-43 **As a user (i.e. A / B-Party) in an on-going voice call, I want to be able to share a live sketch on an image.**

R12-43-1 Access to a shared image sketch should be provided via the in-call screen (i.e. defaulting to an image background or a blank canvas).

US12-44 **As a user (i.e. A / B-Party) in an on-going voice call with an ongoing live sketch sharing, I want to be able to edit the sketch background.**

R12-44-1 Either party shall be able to change the sketch background image and/or colour at any time during the live sketch.

R12-44-2 Any change to the live sketch background shall be shown in real-time on both parties' devices.

R12-44-3 Either party shall be able to select an existing image from the device gallery as the live sketch background.

R12-44-4 Either party shall be able to take a new picture from the device camera to use as the live sketch background.

R12-44-5 Either party should be able to select a live sketch background from a selection of pre-defined template backgrounds.

US12-45 **As a user (i.e. A / B-Party) in an on-going voice call with a live sketch open, I want to be able to zoom and move the background image.**

R12-45-1 Both parties should be able to change the scale of the image (zoom in/out), independent of the image being viewed by the other party.

R12-45-2 Both parties should be able to move around the image, independent of the image being viewed by the other party.

NOTE: These changes to the image are <u>not</u> visible to the other party.

US12-46 **As a user (i.e. A / B-Party) in an on-going voice call with an open live sketch sharing, I want to be able to change the line thickness.**

R12-46-1 The default line thickness initially assigned to the both parties when first opening the live sketch should be the thickness they last selected in any previous sketch session (if applicable).

R12-46-2 Either party shall be able to change the thickness of any lines that they draw at any time during the live sketch session (irrespective of any line thicknesses set on initial default).

2.12.6.3 Specific Requirements for a live sketch on a map

US12-47 **As a user (i.e. A / B-Party) in an on-going voice call, I want to be able to share a live sketch on a map.**

R12-47-1 Access to a live sketch on a map should be provided via the in-call screen (i.e. defaulting to a map background).

R12-47-2 The A-Party's current location should be set as the default location for any new live sketch on a map for both parties.

US12-48 **As a user (i.e. A / B-Party) in an on-going voice call with an ongoing live sketch on a map, I want to be able to interact with the background map.**

R12-48-1 Both parties shall be able to change the scale of the map, independent of the map being viewed by the other party.

R12-48-2 Both parties shall be able to move the map location, independent of the map being viewed by the other party.

NOTE: These changes to the map are not visible to the other party.

US12-49 **As a user (i.e. A / B-Party) in an on-going voice call with an ongoing live sketch on a map, I want to know if the other party has made any edits that I cannot currently see on my map view.**

R12-49-1 If the other party has edited a part of the map that the current party is not viewing, then the current party should be made aware that this is occurring (e.g. via a toast message).

R12-49-2 If the other party has edited a part of the map that the current party is not viewing, then the current party should be able to view all the edits easily on their screen when desired.

US12-50 **As a user (A-Party and B-Party) in an on-going voice call with an ongoing live sketch on a map, I want some additional map-based controls.**

R12-50-1 Both parties should be able to see their own current location on the map (if location is enabled on their device), and to easily move the map to this location at any time.

R12-50-2 Both parties should be able to see the other party's current location on the map (if location is enabled on the other party's device), and to easily move the map to this location at any time.

NOTE: If location is disabled on either party's device, the marker for their location shall not be shown on the map.

R12-50-3 Both parties should be able to send a location marker to the other party, with this marker being visible on both parties' sketches.

2.12.7 Technical Information for Interactive In-call services

2.12.7.1 Overview

The Interactive In-Call Experiences Shared Sketch and Shared Map shall be implemented by the client as described in section 2.12.6 of this document. The technical implementation shall follow the procedures as described in sections 2.9.7, 2.9.8 and 2.9.10 of [RCC.20]. The protocol to use is described in section 2.9.10 of [RCC.20].

2.12.7.2 Shared Sketch

R12-51-1 Requirements R12-29-1, R12-30-1, R12-30-2, R12-31-2, R12-31-3, R12-31-4, R12-32-1, R12-32-2, R12-34-2, R12-35-2, R12-36-1, R12-37-1, R12-37-2 shall be implemented locally on the device. In addition, the procedures as described in sections 2.9.7, 2.9.8 and 2.9.10 of [RCC.20] shall be supported.

R12-51-2 Requirements R12-29-2, R12-30-3, R12-31-1, R12-32-3, R12-33-1, R12-33-2, R12-34-1, R12-34-3, R12-35-1, R12-35-3, R12-37-3, R12-38-1, R12-38-2, R12-39-1, R12-40-1 to R12-40-6, R12-41-1, R12-42-1 shall be implemented locally on the device.

2.12.7.3 Specific Shared Image Sketch Requirements

R12-51-3 Requirements R12-43-1 and R12-44-1 shall be implemented locally on the device.

R12-51-4 Requirement R12-44-2 shall be implemented locally on the device. In addition the procedures as described in [RCC.20] section 2.9.7, 2.9.8 and 2.9.10 shall be supported.

R12-51-5 Requirements R12-44-3, R12-44-4, R12-44-5 shall be implemented locally on the device.

R12-51-6 Requirements R12-45-1, R12-45-2, R12-46-1 and R12-46-2 shall be implemented locally on the device.

2.12.7.4 Specific Shared Map Sketch Requirements

R12-51-7 Requirements R12-47-2, R12-49-1, R12-49-2, R12-50-2 and R12-50-3 shall be implemented locally on the device. In addition the procedures as described in [RCC.20] section 2.9.7, 2.9.8 and 2.9.10 shall be supported.

R12-51-8 Requirements R12-47-1, R12-48-1, R12-48-2 and R12-50-1 shall be implemented locally on the device.

2.12.7.5 Backward Compatibility

CPR networks will provide the SHARED MAP AUTH and SHARED SKETCH AUTH parameters.

Blackbird networks will not provide the parameters SHARED MAP AUTH and SHARED SKETCH AUTH. Having the SHARED MAP AUTH parameter not present the client shall consider the shared map service is disabled. Having the SHARED SKETCH AUTH parameter not present the client shall consider the shared sketch service is disabled.

2.12.8 User Stories and Feature Requirements for the Enriched Post-call experience

This section describes the use case where a user (A-Party) can add additional information after an unanswered / unsuccessful call to the callee (B-Party). This information updates the existing missed call notification on the B-Party side with an enhanced version that not only provides the missed call information but also provides the B-Party with a reason why the A-Party placed the call.

US12-52 **As a user (A-Party), I want to be presented with on-screen options after an unanswered call so that I can add a reason for the call.**

NOTE: An 'unanswered' call is any call attempt that has not been completed as a connection between the A-Party and the B-Party, e.g., but not limited to, B-Party did not answer the call, B-Party rejected the call, or A-Party cancelled the call before B-Party accepted it. A call connected to the B-Party voicemail system is treated as an answered call (as is Call Forwarding).

R12-52-1 If a call was not answered by the B-Party, the A-Party shall have the option to EITHER:

- Write and send a Post-call Note to the B-Party (max 60 characters long) OR
- Record and send a Post-call Voice Message (i.e. audio file, max 5 minutes long) to the B-Party

NOTE: Emoticons and Emojis are supported in Post-call Notes.

R12-52-2 Pre-defined Post-call Notes should be available for the user.

R12-52-3 In case Pre-call Subject was already populated, Post-call Note shall be completed as default with the Pre-call Subject.

R12-52-4 The implementation of pre-defined Post-call Notes on the device may offer some or all of the following features:

- The device may store and display previously entered user-defined Post-call Notes.
- An auto-complete function may be available that lists matching existing Post-call Notes while the user is typing.
- The user may be able to select a Post-call Notes from a list of pre-defined and/or previously used notes.
- The user should have an ability to edit any pre-defined or previously entered and stored Post-call Notes.

R12-52-5 If the B-Party is not connected to data when the call attempt ended, the sending of Post-call Content shall follow the 'Operator Messaging', section 2.4 logic.

US12-53 **As a user (B-Party), I want to see an updated and enriched missed call notification on my device if the caller (A-Party) added a reason after the call was not answered by me.**

R12-53-1 Post-call Notes or Voice Messages shall update the existing standard missed call indication on the B-Party's device.

R12-53-2 If no standard missed call indication is displayed on the B-Party's device because the B-Party rejected the call, any Post-call Note or Voice Message

shall be displayed in a new indication. It should be made clear to the user that this new indication is for a rejected call.

R12-53-3 If the standard missed call indication has already been dismissed by the B-Party, the Post-call Note or Voice Message shall display a new indication. It shall be made clear to the user that this new indication does not represent an additional new missed call.

R12-53-4 The B-Party shall be able to read the Post-call Note from the associated indication, either directly or by expanding the indication.

R12-53-5 The B-Party shall be able to play the Post-call Voice Message from the associated indication, either directly or by expanding the indication.

R12-53-6 If the initial call was already enriched with a Pre-call Subject by the A-Party (using the Pre-call options), the Post-call Note shall replace the initial Pre-call Subject displayed in the indication.

2.12.8.1 Enriched Calling Post-call experience with Non-Enriched Calling enabled contacts

US12-54 **As a user, I want to be able to send a Post-call Note or Voice Message to contacts who are not Enriched Calling enabled.**

R12-54-1 In case the B-Party is not Enriched Calling enabled, then

- A written Post-call Note shall be sent as defined in 'Operator Messaging' see section 2.4.
- A recorded Post-call Voice Message shall be sent as defined in 'Audio Messaging' see section 2.8.

NOTE 1: Post-call Notes can be send to non-RCS contacts (leveraging on SMS) and to plain RCS contacts (leveraging on RCS Chat)

NOTE 2: Post-call Voice Messages can be send to plain RCS contacts (leveraging on Audio Messaging). Post-call Voice Messages cannot be sent to non-RCS contacts.

R12-54-2 If Post-call content is received by the device AFTER the B-Party user has already cleared the previous missed call display indication, a new missed call display indication shall be generated by the device. On display of the enriched call log event the added Post-call content shall be highlighted to make visible why the new notification came up.

2.12.9 Technical Information for the Enriched Post-call experience

2.12.9.1 Overview

The Enriched Post-call experience shall be implemented by the client as described in section 2.12.8 in this document. The technical realisation of the Post-call experience is described in section 2.5 of [RCC.20].

[RCC.20] is applicable for the implementation of Enriched Post-call experience with the following updates:

- In section 2.5.4 of [RCC.20] the reference to Annex A of RCC.07 for the definition of FT MAX SIZE is replaced by a reference to Annex A of the version of [RCC.07] referred to in this profile.

2.12.9.2 User Stories and Feature Requirements for the Enriched Post-call experience

R12-55-1 Requirement R12-52-1 shall be implemented locally on the device. The technical implementation of sending the post call note or Post-call Voice message shall be implemented as described in section 2.5 of [RCC.20].

R12-55-2 Requirements R12-52-2, R12-52-3 and R12-52-4 shall be implemented locally on the device.

R12-55-3 Requirement R12-52-5 shall be implemented based on the post call service under consideration. For Post-Call Note, it shall be implemented as defined in sections 2.4.3 and 2.5.3. For Post-Call Voice Message, it shall be implemented as defined as defined in sections 2.4.3 and 2.7.3.

R12-55-4 Requirements R12-53-1 to R12-53-6 shall be implemented locally on the device.

2.12.9.3 Enriched Calling Post-Call experience with Non-Enriched Calling enabled contacts

R12-55-5 Requirement R12-54-1 shall be implemented based on the post call service under consideration. For Post-Call Note, it shall be implemented as defined in sections 2.4.3 and 2.5.3. For Post-Call Voice Message, it shall be implemented as defined as defined in sections 2.4.3 and 2.7.3.

R12-55-6 Requirement R12-54-2 shall be implemented locally to the device.

2.12.9.4 Backward Compatibility

CPR networks will provide the parameter POST CALL AUTH.

Blackbird networks will not provide the parameter POST CALL AUTH. Having the POST CALL AUTH parameter not present the client shall consider the post call service is disabled.

2.12.10 User Stories and Feature Requirements for Enriched Call Logs

This section describes how the standard Call log / Event log implementations are extended to include additional Enriched Calling content shared either pre-, during, or post-call. It is acknowledged that the detailed UX design will vary across implementations.

US12-56 **As a user (A-Party and B-Party), I want to be able to see any content that was shared pre-call in my call log.**

R12-56-1 Any enriched content that was shared pre-call by the A-Party shall be available in the call-log on both A-Party and B-Party devices, as part of the enriched call log entry for the respective event.

R12-56-2 The requirement above shall apply for both answered and unanswered calls.

R12-56-3 Call Composer information shall be stored in the B-Party's call logs only if the corresponding call actually reached that device.

US12-57 **As a user (A-Party and B-Party), I want to be able to see rich content that was shared during a call in my call log.**

R12-57-1 Rich content that was shared during a call by either the A-Party or the B-Party shall be available in the call log on both A-Party and B-Party devices, as part of the enriched call log entry for the respective event.

R12-57-2 The following rich In-call content shall be available in the enriched call log entry for both parties:

- Files shared during that call (as described in “Share any file during call” section 2.12.4.4 i.e. NOT Image Share)
- Location Push shared during that call
- Messages exchanged during that call

R12-57-3 The following rich In-call content should be available in the enriched call log entry for both parties:

- Final versions of a live sketch sharing during that call

US12-58 **As a user (A-Party and B-Party), I want to be able to see any content that was shared post-call in my call log.**

R12-58-1 Any content that was shared post-call by the A-Party shall be available in the call log on both A-Party and B-Party devices, as part of the enriched call log entry for the respective event.

R12-58-2 If the initial call was already enriched with a Pre-call Subject by the A-Party (using the Pre-call options), the Post-call Note may shall replace the initial Pre-call Subject displayed in the call log.

US12-59 **As a user (A-Party or B-Party), I want to have access to content that was shared with a selected contact from the associated messaging thread at the latest after the call has ended.**

R12-59-1 Specific content shared or exchanged with a contact shall be available to both parties in the associated message threads at the latest after the call has ended (with a new message thread automatically created for the contact if required).

R12-59-2 The following rich content shall be available in the message thread for both parties:

- Files shared during that call (as described in Share any file during call, section 2.12.4.4, i.e. NOT Image Share)
- LocationPush shared during that call
- Messages exchanged during that call

R12-59-3 The following rich content should be available in the message thread for both parties:

- Final versions of a live sketch sharing during that call
- Post-call Voice Messages

R12-59-4 The message thread shall identify content of an enriched call as being associated with a specific call event.

US12-60 **As a user (A-Party or B-Party), I want to have access to content that was shared with a selected contact within a contact-centric view.**

R12-60-1 Specific content shared or exchanged with a contact shall be available to both parties in a contact-centric view (e.g. a gallery view).

NOTE: This contact-centric view could be implemented within the call log, contact and/or message thread views.

R12-60-2 The following rich content should be available in the contact-centric view for both parties:

- Files shared during that call (as described in Share any file during call, section 2.12.4.4 i.e. NOT Image Share)
- Location Push shared during that call
- Sketches shared during that call

R12-60-3 The following rich content may be available in the contact-centric view for both parties:

- Pre-call Images
- Pre-call Geolocation
- Final versions of a live sketch sharing

US12-61 **As a user, I don't want to accidentally delete content from my device, or delete the same content multiple times.**

R12-61-1 If a call item is deleted from the call log, any associated content shared during that call (either pre-call, in-call or post-call) should not be automatically deleted from the message thread or contact-centric view. If such shared content will be deleted, then the user shall be notified of this and given the option to cancel the deletion of the call log item.

US12-62 **As a user (A-Party and B-Party) using any call log entry to enter into the Call Composer, I want to be able to re-use the Pre-call Subject and Image from that former call event.**

R12-62-1 The Pre-call Subject (or Post-call Note) and/or Pre-call Image should be pre-populated if the Call Composer is opened from a call log entry.

R12-62-2 The user shall be able to add and/ or edit any of the pre-call content in the Call Composer when opened from a call log entry.

NOTE: The option to place a plain voice call from the call log remains unaffected.

US12-63 **As a user, I want to see the most relevant information directly in the call log entry and want to be able to access the rest of the enriched content from there.**

R12-63-1 Enriched content shall be displayed according to the following order of priority in the call log:

- Post-call Note or Voice Message
- Important Call Indicator
- Pre-call Subject
- Pre-call Geolocation
- Pre-call Image
- Any other content shared or exchanged during the call

R12-63-2 The user should be able to browse any media that was exchanged pre-call or in-call (as specified in R12-57-1, R12-57-2, R12-57-3) or post-call (as specified in R12-58-1), in relation to the selected call or series of calls (with the selected person), in an aggregated view.

US12-64 **As a user (A-Party or B-Party), I want to trigger contact and calling related activities from each call log entry.**

R12-64-1 The following control options shall be available from the call log listing and/or details views:

- Open contact information (e.g. contact card, quick contact view)
- Place a plain call to the contact

- Open the Call Composer (for Enriched Calling enabled contacts)
- Open contact-centric gallery view

2.12.11 Technical Information for Enriched Call Logs experience

R12-65-1 Enriched Call Logs shall be implemented locally on the device.

2.13 API Extensions

In this profile API Extensions are a Universal Profile baseline feature that is covered in section 3.13.

2.14 Security against Malware

2.14.1 Description

Authentication in RCS services on an individual's device is done with a solution based on username / password combination. There is a risk that these credentials are hijacked by a malware application and used for spoofing identities. There is a need to offer an enhanced security function temporarily, until a long term solution is available.

2.14.2 User Stories and Feature Requirements

US14-1 **As a user, I want to use my Operator communication services safely and securely.**

R14-1-1 RCS services shall use an authentication mechanism that is safe and secure, not allowing 3rd party applications to retrieve any user data including data that is relevant for authentication against networks.

R14-1-2 Authentication mechanism(s) shall be defined for a user on devices with a SIM.

R14-1-3 Authentication mechanism(s) shall be defined for a user on devices without a SIM.

R14-1-4 Devices containing a SIM which is associated with the user's RCS identity shall use any available SIM-based authentication mechanism in preference of a non-SIM based authentication mechanism.

R14-1-5 User interaction to ensure security solutions shall be minimised.

R14-1-6 If manual user interaction is required, this interaction shall be limited to a single one time experience and not be repeated, in case – but not limited to – device re-provisioning.

R14-1-7 If manual user interaction is required, for native implementations any user interaction shall be performed on one single screen (or an intuitive flow of screens).

US14-2 **As an Operator, I want to customise the enhanced security function.**

R14-2-1 The security solution shall offer the option for the Operator to enable or disable the function with appropriate security control.

R14-2-1-1 Enable or disable over the air.

R14-2-1-2 Enable or disable for selected devices.

R14-2-2 If user interaction is required, the user shall be guided to accomplish the interaction in a way that RCS use of the primary identity is enabled in a secure way after the set-up process.

US14-3 **As an Operator, I want to ensure that traffic and content generated by an RCS identity is generated by that identity's true user.**

R14-3-1 Second Party and Third Party applications shall inherit the identity of the stack therefore whilst API access may be controlled (not addressed here) no additional RCS authentication shall be required from second and third party applications.

R14-3-2 All traffic generated by an identity shall be identifiable as such.

2.14.3 Technical Information

The technical implementation of RCS involves a number of technologies on the user network interface. Encryption, user authentication and access authorization is applied by the client and the network on a per protocol basis (e.g. SIP, HTTP, IMAP). The level of security for the individual technologies depend on the selection of the mean of authentication applied in the technical specification.

2.14.3.1 User Authentication

The following main user authentication and methods are used in RCS.

R14-4-1 User Authentication via the SIM based Authentication and Key Agreement protocol (AKA). This authentication protocol comes with a high level of security based on shared secrets exchanged between the SIM and the network authentication centre. As a result of the initial authentication session keys are agreed which are used to secure the UNI signalling flow. As an extension to the SIM based authentication the key material received from the AKA authentication can be used by the client to create additional security associations with network services based on the Generic Bootstrap Architecture (GBA) as defined in [3GPP TS 33.220]

R14-4-2 User Authentication via the basic or digest access authentication based on credentials (user name and password) exchanged between the application and the peer network application. Since the RCS user stories aim to prevent that the user is involved in the exchange of the access credentials an automatic provisioning of the credentials is applied via device provisioning. The digest procedure in itself is secure and robust against attacks. It is vulnerable to attacks to discover the credentials via access to the application's key store or spoofing attacks based on the credential management procedure (e.g. malware pretending to be an RCS application).

R14-4-3 Network based user identification via "header enrichment" or "GPRS IMS Bundled Authentication" (GIBA) which is in fact a single-sign-on (SSO) prolonging the authentication of the user at the time of bearer set-up for the usage of services within the bearer session. The bearer set-up in a 3GPP network is typically based on the SIM based Authentication and Key Agreement protocol. The IP address assigned at the time of bearer set-up is used as the "token" to identify the user within the existing bearer session. This identification mechanism is secure in itself, provided that the Service Provider takes precautions in securing the trusted and untrusted network access to prevent fraudulent IP address claims. However attackers will be

able to gain unauthorised access to the network services using a bearer session on behalf of the user.

R14-4-4 User based Authentication via one time password (OTP), whereby the user is authenticated for a signalling transaction by using a token transfer over a secondary channel with a secure identification or authentication context, e.g. the short message service or a sign on to a web portal. Based on the one time authentication a long term authentication context can be generated (SSO) to prevent the need for subsequent authentication transactions. Depending on the usage scenario the OTP based authentication can be executed without user impact (e.g. primary devices in non 3GPP access) or with user impact (additional non SIM devices).

The single token exchange via OTP is secure in itself. However it is vulnerable to spoofing attacks to gain access to the token used to authenticate the access, e.g. via initiation of the authentication by malware on behalf of the user and eavesdropping of the OTP transfer if the secondary channel is provided by the same (compromised) device as the primary channel.

2.14.3.2 Encryption

The User Network Interface transactions should be always encrypted to prevent eavesdropping of the user's personal communication in the various access and transit networks. RCS makes use of the common encryption protocols, i.e. Transport Layer Security and IPsec.

2.14.3.3 Storage of Authentication and Identification Data

The RCS client need to store for active RCS user authentication and identification data (user identification data, password, token) used for network access. The client shall store this data in a secure manner to prevent access from users and invaders.

2.14.3.4 Technical Implementation of User Stories and Service requirements

For the requirements in user story US14-1 the following applies.

R14-4-5 RCS makes use of a number of authentication mechanisms with some of them being vulnerable to attacks as summarised on a high level in section 2.14.3.1. Thus the risk that 3rd party applications are able to retrieve user data or to make use of communication services on behalf of the user persists. The main RCS vulnerability comes from the fact that user identification and authentication data is made available to consumers via a device management technology with weak security measures.

The following authentication mechanisms and encryption methods are used on a UNI technology basis.

R14-4-5-1 HTTP(s) based client configuration in 3GPP access makes use of either the Generic Bootstrapping Architecture (GBA) (see R14-4-1) or network based user identification via (see R14-4-3) as defined in section 2.4 and 2.2 of [RCC.14] respectively. The authentication mechanism is negotiated between client and server as defined in [RCC.14]. A client not being in SIM Ready State shall not invoke client configuration procedure.

R14-4-5-2 As defined in section 2.2.5 of [RCC.14] the Service Provider may decide to further secure the network based authentication identification via invocation of the SMS based procedure which adds additional authentication (see R14-4-4). The SMS based procedure may be further secured by the Service Provider by enforcing user input of the OTP as defined in section 2.3.5 of [RCC.14].

Client configuration transactions carrying user data are encrypted via TLS/SSL as defined in sections 2.2.5 of [RCC.14] and Annex B.

HTTP(s) based client configuration on non 3GPP access for primary makes use of either AKA based on the GBA (see R14-4-1) or the authentication method (see R14-4-4) as defined in sections 2.3, 2.5 and 2.6 of [RCC.14]. The authentication mechanism is negotiated between client and server as defined in [RCC.14]. A client not being in SIM Ready State shall not invoke client configuration procedure

Client configuration transactions are encrypted via TLS/SSL as defined in 2.3.3.2.5 of [RCC.07].

R14-4-5-3 The authentication method for IMS access depends on the IMS registration mode of the device, the type of access and the device configuration. The client shall apply the IMS authentication via SIM AKA as defined in section 2.13.1.1.2 of [RCC.07] if is based on a common implementation of Multimedia Telephony, SMS over IP and other RCS services and the client configuration parameter ALWAYS USE IMS APN is set to value "0" or "1" as defined in section 15.4.1 of [RCC.60]. Otherwise the client shall use SIP Digest Authentication as defined in section 2.13.1.1.2 of [RCC.07].

A client not being in SIM Ready State shall not register in IMS.

R14-4-5-4 The encryption of SIP signalling is determined by client configuration as defined in section 2.8 and A.2.10 of [RCC.07] and Annex B.

R14-4-5-5 The authentication method for HTTP transaction of File Transfer over HTTP shall be based on either basic or digest authentication (see R14-4-2) based on the credentials received by the client via device configuration or via bootstrapped security association (see R14-4-1) as defined in section 3.5.4.8.3 and 3.5.4.8.6.4 of [RCS6.0].
A client not being in SIM Ready State shall not invoke the file transfer transactions.

HTTP File Transfer transactions carrying user data are encrypted via TLS/SSL as defined in 3.5.4.8.5 of [RCC.07].

R14-4-5-6 The authentication method for IMAP sessions for the Common Message Store is either based on an AKA based bootstrapped security association (see R14-4-1) or based on basic authentication (see R14-4-2) with the CMS credentials received by the client via device configuration as defined in section 2.13.1.5 of [RCS6.0].

R14-4-5-7 The authentication mechanism is negotiated as defined in section 4.1.4.1 of [RCS6.0]. A client which is not in SIM Ready State shall not login to the Common Message Store.

IMAP sessions are encrypted by use of TLS as defined in section 2.13.1.5 of [RCS6.0].

R14-4-5-8 For MSRP transaction no additional user identification is applied. The MRSP transactions rely on the user identity that has been authenticated in the related SIP registration of session.
The encryption of MSRP signalling is determined by client configuration as defined in section 2.8 of [RCC.07] and Annex B.

R14-4-5-9 For RTP media streams no additional user identification is applied. The RTP transactions rely on the user identity that has been authenticated in the related SIP registration of session.

The encryption of RTP streams is determined by client configuration as defined in section 2.8 of [RCC.07] and Annex B.

R14-4-6 For the requirements in user story US14-2 to minimise the user interaction for security solutions a case by case analyses of user interaction flows for device configuration and personalization is done below. User interactions can be characterised with regard to their user experience as “in-band” or “out-of-band”. In-band refers to user interactions that can be smoothly integrated in the user interface based on well-defined RCS signalling flows. Out-of-band refers to user interaction flows that come not with RCS signalling flows but with another media channel, most likely a user readable short message.

R14-4-6-1 “HTTP(s) based client configuration mechanism over 3GPP access” as defined in section 2.2 of [RCC.14] is transparent for the user if the Service Provider supports with the network to supports network based user identification. If the Operator does not support network based user authentication, then it may invoke the procedures for the client configuration over non 3GPP access. The corresponding user interactions apply as defined below.

R14-4-6-2 “HTTP(s) based client configuration mechanism over non 3GPP access” as defined in section 2.3 of [RCC.14] requires user prompt for MSISDN and OTP password which is “in-band”. The OTP password in itself is received in between the two prompts is “out-of-band”. The exact flow depends of the device capabilities to determine the user identity (IMSI) of the SIM or to receive short messages on UDH ports or the Service Provider policy to enforce user prompts for OTP as defined in section 2.3.2 of [RCC.14].

R14-4-6-3 For the configuration of additional devices sharing an identity there are a number of user interactions involved.

The primary device holding the user’s identity to be federated with the additional device may support a procedure to enable the user consent based on the external EUCR as defined in section 2.1.2 of [RCC.15]. The user dialogue associated with this action is “in-band”.

The procedure to request the federation of the user identity of a primary device via the “HTTP(s) based client configuration mechanism for alternative devices sharing a user identify” as defined in section 2.3.5 of [RCC.14] requires user prompt for MSISDN and Service Provider indication on the additional device. In addition the user may need to enter an OTP or a PIN as defined in section 2.5.1 of [RCC.14] and 2.1.2.1 of [RCC.15]. This full user interaction flow is “in-band”.

The reception of the OTP on the primary device via SMS as defined in section 2.5.1 of [RCC.14] is “out-of-band”.

The user interaction for the federation consent on a primary device via the external EUCR as defined in section 2.1.2.1 of [RCC.15] is “in-band”.

The user interaction for the input of a PIN on the primary device as defined in section 2.1.2.2 of [RCC.15] is “in-band”.

R14-4-7 For the requirements in user story US14-2 the following applies:

R14-4-7-1 The enhanced security function can be enabled or disabled by the Service provider as defined in section 2.2.5 and 2.3.3 of [RCC.14].

R14-4-7-2 The enhanced security function makes use of general client procedures for the user identification and authorization. These procedures have only limited capabilities to convey Operator specific explanatory text. Only the out-of-band transaction provides the Service Provider with the capability to covey specific information. However this is outside of the scope of this document.

R14-4-8 For the requirements in user story US14-3 the following applies:

R14-4-8-1 The RCS implementation assumes one common user identity managed across all involved technologies (e.g. SIM, Device Configuration, IMS, and Messaging Server, Common Message store, Voice and Video services). It is the Service Provider responsibility to maintain this user identity and the related authentication, permission and preference data in sync across all technologies and network services. The RCS client shall use for RCS access only the user data retrieved from the SIM or via the user profile received from Device Configuration.
This allows the network to assign all traffic and service usage events to this single user identity.

2.14.3.5 Applicability of Authentication Methods

This section gives an overview of the applicability and support requirements of user authentication methods defined in section 2.14.3.1 of this document for the types of RCS clients defined in this specification and its interfaces to the network.

User Network Interface	Primary Device	
	Single Registration Configuration (see NOTE)	**Dual Registration Configuration (see NOTE)**
Service Provider Client Configuration Configuration Over Cellular Networks	Support of network based authentication is mandatory. Support of fallback to OTP based authentication is mandatory. Support of security configuration mechanism over PS and support of SMS port zero policy is mandatory. Support of GBA authentication is optional.	
Service Provider Client Configuration Configuration Over non 3GPP networks	Support of OTP based authentication is mandatory. Support of GBA authentication is optional.	
IMS Access Authentication	Support AKA based authentication is mandatory in accordance with [PRD-IR.92]	Support of SIP digest with the credentials from client configuration is mandatory in accordance with [RCC.07]
HTTP File Transfer Content Server Authentication	Support of HTTP digest and basic authentication with the credentials from client configuration is mandatory Support of GBA based authentication is optional.	
Message Store Server Authentication	Support of plain password authentication is mandatory. Support of GBA based authentication is optional.	

Table 23: Authentication Mechanisms for embedded clients on primary device

NOTE: The configuration of whether to support a single registration or two separate registrations is dependent on the ALWAYS USE IMS APN as defined in section 15.4.1 of [RCC60].

User Network Interface	Primary Device		
	ORSC		3RC, VARA
	Using terminal API	Not using terminal API	
Service Provider Client Configuration Configuration Over Cellular Networks	Same as device that provides the terminal API	Support of network based authentication is mandatory. Support of fallback to OTP based authentication is mandatory. Support of security configuration mechanism over PS and support of SMS port zero policy is mandatory. The authentication mechanism is negotiated between the client and server in accordance with [RCC.14]	Same as device that provides the terminal API
Service Provider Client Configuration Configuration Over non 3GPP networks	Same as device that provides the terminal API	Support of OTP based authentication is mandatory.	Same as device that provides the terminal API
IMS Access Authentication	Same as device that provides the terminal API	Support of SIP digest with the credentials from client configuration is mandatory	Same as device that provides the terminal API
HTTP File Transfer Content Server Authentication	Same as device that provides the terminal API	Support of HTTP digest and basic authentication with the credentials from client configuration is mandatory	Same as device that provides the terminal API
Message Store Server Authentication	Same as device that provides the terminal API	Support of plain password authentication is mandatory.	Same as device that provides the terminal API

Table 24: Authentication Mechanisms for non-embedded clients on primary device

2.15 Data Off

In this profile Data Off is a Universal Profile Baseline feature that is covered in section 3.15.

2.16 RCS Settings

2.16.1 Description

RCS is a Service Platform for Operators to develop and implement new communication services. To allow users to manage their RCS services appropriately, a “Settings” function needs to be implemented into devices / clients.

Settings shall only be applicable if the individual Operator has deployed the correspondent service.

2.16.2 User Stories and Feature Requirements

US16-1 **As a user, I want to switch between RCS instances on one device to ensure smooth operation.**

NOTE: Details of the behaviour of this switch are described in section 2.2 'Device Provisioning'.

R16-1-1 An RCS "Master Switch" shall be available to activate / deactivate the native RCS service on the device. If the Master Switch is set to "OFF", non-RCS IMS services (e.g. VoLTE) shall not be affected.

R16-1-1-1 If the Master Switch is set to "OFF", VARAs relying on RCS APIs shall not be able to use RCS functionality on that device unless provided by an active ORSC.

R16-1-2 Master switch shall be placed under settings / wireless & networks. Or equivalent.

R16-1-2-1 A view of the Master switch should be placed in messaging settings.

R16-1-2-2 A view of the Master switch should be placed in dialler settings.

R16-1-3 If the Master Switch is visible from more than one location on the device, then the implementation shall be consistent (i.e. if the Master Switch is changed in one location, the change shall be consistent for all locations).

R16-1-4 Any downloaded applications that have been installed on a device shall have an own switch to activate / deactivate themselves (this may be provided by the application or the operating system of the device).

R16-1-5 The Master Switch shall be labelled "Advanced Calling & Messaging".

R16-1-5-1 User shall be informed about the main features of RCS (Chat, Group Chat, File Transfer and Video).

NOTE: The OEM is free to apply their individual style guide for this information.

R16-1-5-2 If the user switches the Master Switch to "OFF", a User Message (e.g. pop up or toast) shall be presented to the user to inform them what the consequences are and the user shall have to confirm the action.

R16-1-6 In this state, the deactivated native RCS client is in status "Deactivated". Consequently, no messages can be sent nor capability requests are answered through this RCS client.

R16-1-7 After reactivation of the native RCS client, all its entry points shall be activated again.

US16-2 **As a user, I want to be able to set and change an RCS Chat Alias.**

R16-2-1 The user shall have the option to customise the name label which is presented during RCS Communications to participants for whom the user is not in the contact list.

US16-3 **As a user, I want to enable or disable IP Voice Calls.**

R16-3-1 Users shall be allowed to activate/deactivate the IP Voice Call using an appropriate switch.

R16-3-2 The default position of the switch shall be based on operator configuration (ON or OFF).

R16-3-3 This user setting shall be visible only when IP Voice Call is activated by the MNO.

R16-3-4 When supplementary service settings are available to the user, the user selection shall be applied for the voice and video services irrespective of the underlying technology used for making the voice/video call.

US16-4 **As a user, I want to switch "ON/OFF" SMS Delivery Notification.**

R16-4-1 The user shall have the option to select or deselect automatically sending a Delivery Notification for SMS they receive in an Integrated Messaging scenario.

R16-4-2 The default setting shall be based on individual Operator configuration.

US16-5 **As a user, I want to enable or disable automatic MMS download in Integrated Messaging.**

R16-5-1 The user shall have the option to enable or disable automatic MMS download in Integrated Messaging.

R16-5-2 The default setting shall be "enabled".

US16-6 **As a user, I want to enable or disable MMS download in roaming case in Integrated Messaging.**

R16-6-1 The user shall have the option to enable or disable the automatic download of MMS whilst they are roaming.

R16-6-2 The default setting shall be "disabled".

US16-7 **As a user, I want to personalise my device and need access to settings that allow me to do so.**

R16-7-1 The user should have the option to personalise the native or downloadable RCS client. The following features should be covered:

- Notification sounds for incoming messages (e.g. xMS, 1-to1 Chat Messages, Group Chat Messages, File Transfers),
- Notification preferences,
- Customised ringtones (for voice calls or IP Video),
- Visual customization for chat (for example fonts, bubble styles, backgrounds etc.),
- LED settings.

US16-8 **As a user, I want to enable or disable the sending of the notification that tells the sender the message was displayed.**

R16-8-1 The user shall have the option to enable or disable the sending of a notification to the sender that tells the sender the message was displayed.

R16-8-2 The default for this setting shall be "enabled".

US16-9 **As a user, I want to enable or disable automatic acceptance for File Transfer.**

R16-9-1 The user shall have the option to enable or disable auto-acceptance for incoming File Transfer:

R16-9-1-1 FT Auto Accept: I/O (default value set to I).

R16-9-1-2 FT Auto Accept while roaming: I/O (default value set to O).

US16-10 **As a user, I want to be able to control the image resizing options in RCS File Transfer.**

R16-10-1 The user shall have the option to set one of the following selections:

R16-10-1-1 Always resize a selected option which is then stored as default value

R16-10-1-2 Always ask

R16-10-1-3 Never resize

R16-10-2 The default setting shall be “always ask”.

R16-10-3 For downscaling pictures, the following requirements shall apply:

R16-10-3-1 The size of the image shall be reduced using following algorithm: Scale both dimensions by the same factor F (same for width and height so the aspect ratio is maintained). Compress as JPG with q=75%. Compare the new image size with the original, and only offer the possibility to resize if the resulting file is smaller than the original one.

R16-10-3-2 The default scale factor F for the image shall be, F = min (1280/w, 1280/h, 1.0). It shall be noted the w (width) and the h (height) shall be used in pixels for the calculation.

R16-10-3-3 If the factor (F) is 1, the original image shall be transferred.

US16-11 **As a user, I want to be able to control the video resizing options in RCS File Transfer.**

R16-11-1 The user shall have to option to set one of the following selections:

R16-11-1-1 Always resize to a selected option which is then stored as default value

R16-11-1-2 Always ask

R16-11-1-3 Never resize

R16-11-2 The default setting shall be “always ask”.

R16-11-3 The resizing options shall be based on OEM / developer choices including the default value of 480p @ 1200kbps.

R16-11-4 When the set of resizing options are presented to the user, the default one highlighted or selected shall be 480p encoded at a rate of 1200 kbps.

R16-11-5 The video resizing shall be accomplished in the background and the user shall be able to take control of the device instantly (to e.g., but not limited to, answer incoming calls, make a call, etc.).

US16-12 **As a user, I want to enable or disable the LED notification (if such function is supported by my device).**

R16-12-1 The user shall have the option to enable or disable the device LED for incoming message or File Transfer notification.

R16-12-2 The default setting shall be “enabled”.

US16-13 **As a user, I want to enable or disable vibration notification for new incoming RCS messages or File Transfers.**

R16-13-1 The user shall have the option to enable or disable the device vibration for incoming message or File Transfer notification.

R16-13-2 The default setting shall be “enabled”.

US16-14 **As a software developer, I want to display on request an ‘about’ page that explains details of the RCS client.**

R16-14-1 The device shall provide the user with an ‘about’ page that indicated the version of the device and the RCS implementation to allow efficient identification of the client / device details.

US16-15 **As a user, I want to influence the proposed service for messages and transferring files**

R16-15-1 If the operator configured the device for any variant of Integrated Messaging, a setting shall allow the user to select the default sending method to be used when the user sends a message. The user is able to select:

- 'Proposed Messaging Service' (follow rules as defined in Operator Messaging or Chat / File Transfer), or
- 'SMS' and 'MMS' (if MMS is disabled, the only option will be SMS) or
- 'Chat' and 'FT

US16-16 **As a user, I want to be able to change my preference for whether undelivered RCS messages are automatically sent again by SMS or not.**

R16-16-1 The user shall be able to set one of the following options:

R16-16-1-1 Always resend undelivered RCS messages as SMS in cases of client fallback to SMS (as specified in US5-1, US7-2 and subsequent requirements),

R16-16-1-2 Always ask,

R16-16-1-3 Never resend undelivered RCS messages as SMS in cases of client fallback to SMS (as specified in US5-1, US7-2 and subsequent requirements).

R16-16-2 The default setting shall be "always ask".

US16-17 **As a user, I want to set the default messaging client to be used for sending messages and handling RCS notifications.**

R16-17-1 The user shall have the option to choose from a list of available RCS clients (native client, ORSCs and 3RCs) which one to be used as the default messaging client.

R16-17-2 A "default messaging client" toggle list shall be made available in the device to achieve this.

R16-17-2-1 This toggle list shall only be displayed when there is more than one client able to access and manage RCS messaging services.

R16-17-2-2 All native clients, ORSCs and 3RCs that are able to access and manage RCS messaging services shall appear in the list.

R16-17-2-3 Only one client can be selected as the default messaging client at a time.

R16-17-2-4 Only native RCS clients, ORSCs and 3RCs that are able to access and use RCS services shall appear on the list.

US16-18 **As a user, I want to be able to block specific contacts**

R16-18-1 It shall be possible to block specific contacts.

R16-18-2 All incoming communications from an identified blocked contact shall be blocked by the device.

R16-18-3 The user shall not be notified about any incoming communications from a contact on their local device blacklist.

R16-18-4 The blocked sender shall not be notified about the status of being blocked. Operator messages and file transfers should remain in "sent" state only and not indicate "delivered" and/or "read".

R16-18-5 In the case that a blocked contact makes a voice or video call, they will hear a ringtone or busy tone. Any further call treatment is determined by the operator

R16-18-6 Exception: In the case where a blocked contact is participating in a Group Chat, the requirements above shall not apply.

2.16.3 Technical Information

A number of requirements for service configuration parameters on the client are provided.

2.16.3.1 Technical Implementation of User Stories and Service Requirements

R16-19-1 The technical implementation of the requirements for user story US16-1 to switch between multiple RCS instances on a device are provided in Device Provisioning, see section 2.2.

R16-19-2 The technical implementation of the requirements of US16-1 regarding Master Switch shall be provided by client via the following procedures:

- If the user changes the value of the "Master Switch" from "ON" to "OFF", the client shall send a HTTP client configuration request with the "vers" parameter defined in [RCC.14] set to the value stored for the local client configuration and the "rcs_state" parameter defined in [RCS6.0] to "-4". The client shall expect configuration server responses as defined for client configuration requests with positive integer values in the "vers" request parameter as defined in [RCC.14] and process is accordingly. The client shall keep the lasts client configuration data locally stored.
- If the validity of the configuration XML document expires or it receives a network request for client configuration as defined in section 3 of [RCC.14] and the "Master Switch" is set to "OFF", then the clients shall not send a HTTP configuration request but keep the configuration data locally stored.
- If the user changes the value of the "Master Switch" from "OFF" to "ON" then the client shall send a HTTP client configuration request with the "vers" parameter defined in [RCC.14] and the "rcs_state" parameter defined in [RCS6.0] to the value stored for the local client configuration.
- If the user changes the value of the "Master Switch" from "ON" to "OFF" and the client is in RCS-CS or RCS-AA device mode then it shall terminate existing sessions and cancel existing requests for RCS services. If the device is VoLTE/VoWiFi capable and the IMS registration covers VoLTE/VoWiFi, then the client shall re-register to remove the services apart from IP Voice Call and IP Video Call, SMS over IP (see also section 2.9.1.4 of [RCC.07]). In all other cases the client shall de-register from IMS.
- If the user changes the value of the "Master Switch" from "ON" to "OFF" and the client is in RCS-VoLTE device mode, then it shall terminate existing sessions and cancel existing requests for services other than IP Voice Calls and IP Video Call and SMS over IP (see also section 2.9.1.4 of [RCC.07]). It shall re-register in IMS with only the

relevant ICSI and feature tags of [PRD-IR.92], [PRD-IR.94] respectively.

- If the user changes the value of the "Master Switch" from "OFF" to "ON" and the client is not registered for any of the IP Voice Call, IP Video Call or SMS over IP, then the client shall register in IMS for any supported and active RCS services.
- If the user changes the value of the "Master Switch" from "OFF" to "ON", and the client is registered for any of the IP Voice Call, IP Video Call or SMS over IP, then it shall re-register in IMS to add the feature tags of any supported and active RCS services according to configuration.
- If the "Master Switch" is set to "OFF" and the client is registered in IMS for any of the IP Voice Call, IP Video Call or SMS over IP and
    - it receives an OPTIONS request it shall respond with 200 OK but no RCS feature tags in the contact header
    - it receives an INVITE or MESSAGE request with RCS feature tags in the accept-contact header, it shall respond with 480 Temporarily Unavailable.
- If the "Master Switch" is set to "OFF", and Backup & Restore as defined in section 2.9 is enabled then the client shall not synchronise with the common message store if a trigger as defined in section 4.1.6.8 of [RCS6.0] applies.
- If the user changes the value of the "Master Switch" from "ON" to "OFF", the RCS client shall log-out from a session with the Common Message Store.
- If the user changes the value of the "Master Switch" from "OFF" to "ON" and Backup & Restore as defined in section 2.9 is enabled then the RCS client shall take this as a trigger for synchronization with the Common Message Store.

R16-19-3 The requirements for user story US16-2 shall be implemented locally on the device. The value of the parameter is used by the client to populate the User Alias as defined in 2.5.3.3 of [RCC.07].

R16-19-4 The term ‘IP Voice Call’ is interpreted as IR.51 Voice over Wi-Fi in this context. The requirements for user story US16-3 shall be implemented locally on the device. The client configuration is only relevant if the Service Provider has activated the IP Voice Call on the device via the PROVIDE IR51 VOICE configuration parameter defined in section A.1.12 of [RCS6.0] and the Service Provider has determined that the switch to enable or disable IP voice calls is displayed to the user via the configuration parameter IR51 SWITCH UX as defined in section 10.3.2 of [RCC.61]. If IP Voice Call is disabled by the user the device shall behave as if it has been disabled by the Service Provider (see section 2.10.3 of this document).

R16-19-5 As a clarification to the requirements for user story US16-4, if SMS is provided by means of the Short Message Service as defined in [3GPP TS 23.040] or the Short Messaging Service over IP as defined in IR.92 (see section 2.4.3.1 of this document) it shall be noted that the SMS STATUS REPORT to notify the sender of a successful delivery is sent by the Service Centre and not by the receiving device. Therefore it is not the

recipient controlling sending of a Delivery Notification. Instead the sender has the ability to request delivery report for sent short messages To prevent the SC to send SMS STATUS report the originating client shall not request an SMS STATUS REPORT when submitting a short message.

R16-19-6 The configuration parameter defined in the requirements for user stories US16-5 and US16-6, controls the retrieval behaviour (immediate or deferred retrieval) of the MMS user agent of the integrated messaging client if MMS is provided by the client via Multimedia Messaging Service as defined in section 2.4.3.1 of this document.

R16-19-7 If the device detects a roaming situation and the user has disabled MMS download in roaming case, then the MMS user agent should apply deferred retrieval behaviour. The user should be notified of a received MMS at the time of reception of the MMS notification.

R16-19-8 If the device detects a roaming situation and the user has enabled MMS download in roaming case, then the MMS user agent should apply the retrieval behaviour as determined by the "MMS automatic download" setting of US16-5.

R16-19-9 The requirements for user story US16-7 shall be implemented locally on the device.

R16-19-10 If generating notifications about messages being displayed is disabled in accordance with the requirements for user story US16-8, then a client receiving a message or file shall disregard the disposition notification header with value “display” and not generate a notification for “displayed”.

R16-19-11 The configuration parameters for automatic acceptance of File Transfer of US16-9 shall be implemented locally on the device. The parameters shall overwrite the Service Provider auto acceptance settings provided by the FT AUT ACCEPT defined in section A.1.4 of [RCC.07]. The FT AUT ACCEPT value received in the client configuration provides the default settings of the FT Auto Accept parameter controlled by the user. Once the user has altered the settings the value of FT AUT ACCEPT from the device configuration becomes irrelevant.

R16-19-12 The requirements for user stories US16-10 to US16-16 shall be implemented locally on the device.

R16-19-13 The technical implementation of the requirements of user story US16-17 to switch between multiple RCS clients on a device are provided in Device Provisioning, see section 2.2.

R16-19-14 The technical implementation of the requirements of user story US16-18 shall be implemented as follows:

R16-19-14-1 For 1-to-1 chat; the definitions of section 3.3.4.1.1 of [RCC.07] apply. However to satisfy the requirement R16-18-4 the client shall not issue a delivery notification with status “delivered” which will be sent back to the sender. The chat message shall be discarded by the client.

Note: Suppression of the "delivered" disposition notification by the client will likely result in the invocation of Delivery Assurance procedures on the originating client or in the network, resulting in the subsequent delivery of fallback message, e.g. via SMS.

R16-19-14-2 To satisfy the requirement R16-18-4 for File Transfer via MSRP the client shall accept the session invitation for a File Transfer from a

address contained in the local blacklist of the client. The client shall follow the procedures for File Transfer via MSRP but not notify the user about the incoming File Transfer. The client shall discard the file received during the File Transfer session.

R16-19-14-3 For File Transfer via HTTP, Audio Messaging and Geolocation Push; the client shall apply the procedure for the chat message as defined in R16-19-14-1. For chat messages for File Transfer via HTTP or Audio Messaging the client shall not continue the File Transfer procedure, i.e. not attempt to download the thumbnail or the file from the FT content server.

R16-19-14-4 To satisfy the requirement R16-18-6 the client shall not screen received session invitations or chat messages received in a Group Chat session for originator addresses contained in the local client blacklist.

R16-19-14-5 To satisfy the requirements of R16-18-5, if the client receives an incoming call request for a voice or video call from an address contained in the client local blacklist, then the client shall, based on a client implementation option,

- accept the incoming call request without notifying the user and without answering the call,
- reject the incoming call request based the procedures defined for user determined user busy.

R16-19-14-6 For Enriched Pre-Call and Post call services; if the client receives a session invitation for an RCS Enriched Calling session from an address contained in the client local blacklist, the client shall accept the session request and all received Pre-call and Post-call elements as defined in [RCC.20] but not notify the user.

R16-19-14-7 For a short message received from an originator address contained in the client local blacklist, the client shall confirm the delivery, shall not notify the user and shall discard the short message.

R16-19-14-8 For MMS messages, if the client receives a MMS Notification from an originator address contained in the client local blacklist, the client shall confirm MMS Notification, shall stop processing of the MMS transaction and shall not notify the user.

3 Universal Profile Baseline Features

The features in this section are not part of this profile, but are aimed to be included in its successor. They are thus not mandatory for implementation for Pre-Universal profile devices and clients. However if the OEM or application developer decides to provide them, this section defines all necessary details.

3.9 Backup and Restore

3.9.1 Description

Backup & Restore shall allow users to automatically store messages and message content on the network and restore those in case of e.g., but not limited to, handset exchange or reset to factory settings. It is expected that the infrastructure components that are used for this function will allow extension to multiple devices being used by the same user identity.

In order to limit the complexity of this profile, this section is not mandatory for implementation for Pre-Universal profile devices and clients. However the OEM or application developer decides to allow for Backup & Restore of RCS content, then this section defines all necessary details.

There is a clear ambition to include requirements for Backup & Restore as mandatory for implementation in the successor to this profile.

3.9.2 User Stories and Feature Requirements

US9-1 **As an RCS user, I want to replace my handset with another RCS capable device or 'factory reset' my RCS device without losing all my messages and message content.**

R9-1-1 The operator shall be able to implement a network storage that allows to backup and restore messages and message content (including sent message status information and the message service indicator) seamlessly.

R9-1-2 In the case the user changes or resets their device to factory status, the device shall restore all messages and message content from the network storage if the users confirm they wish to do so.

R9-1-3 The operator shall be able to configure devices to enable or disable the availability for backup and restore for their users.

NOTE: 'Messaging for Multi-Device' as defined in [RCC.61] is not supported in the scope of the Pre Universal profile and has been deferred.

3.9.3 Technical Information

3.9.3.1 Overview

Backup and Restore requires the deployment of a Common Message store in the network and a dedicated Message Store client on the device as defined in section 4.1 of [RCS6.0], [RCC.09] and [RCC.11].

Client interactions with the Common Message store shall follow the procedures described in sections 4.1.4, 4.1.6 and Annex B.4. of [RCS6.0].

3.9.3.2 Technical Implementation of User Stories and Service Requirements

R9-2-1 Requirement R9-1-1 shall be fulfilled by the procedures described in section 3.9.3.1 of this document.

R9-2-2 For requirement R9-1-2, the reset to factory status shall be implemented locally on the device. If backup and restore is enabled for the user, the client shall connect to the CMS and fetch all stored objects according to procedures described in section 3.9.3.1 of this document.

R9-2-3 For requirement R9-1-3, the MESSAGE STORE URL parameter as defined in Annex A.1.4.3 of [RCS6.0] shall be configured accordingly.

3.9.3.3 Backward compatibility

Not applicable.

3.13 API Extensions

3.13.1 Description

This section explains the use cases, requirements and technical implementation of APIs that are available on devices to developers. In order to limit the complexity of this profile, this section is not mandatory for implementation for Pre-Universal profile devices and clients. However the OEM or application developer decides to make terminal APIs available, then this section defines all necessary details.

There is a clear ambition to include API requirements as mandatory for implementation in the successor to this profile.

RCS APIs enable operator developers (MNOs), OEM developers (OEMs) and developers from companies outside of the traditional operator ecosystem to enrich their services by integrating RCS features into their applications.

Using APIs, MNOs can open up RCS capabilities to developers to propose innovative new services to their customers which increase RCS usage and data traffic consumption.

This chapter covers requirements for the APIs that must be made available to developers on any RCS device. The same APIs should also be made available to developers by the operator via network APIs.

NOTE: In this document “developer” means either OEM application developer, MNO application developer or Third party developer

3.13.2 User Stories and Feature Requirements

US13-1 **As a user, I want to be able to install and use new applications enriched with messaging services and enhanced with new innovative features.**

US13-2 **As a developer, I want to provide innovative applications based on, or using operator messaging services without having to implement the full infrastructure necessary to provide such services.**

US13-3 **As an operator, I want to open up my RCS messaging and service data channel infrastructure to developers and third parties so that their applications can be enriched with these RCS features.**

R13-3-1 APIs shall be made available for the following RCS services and features:

R13-3-1-1 Capability discovery,

R13-3-1-2 Chat, Group Chat,

R13-3-1-3 File Transfer including geo-location,

R13-3-1-4 Audio Messaging,

R13-3-1-5 Enriched Calling Pre-Call features, Enriched Calling Post call features, Enriched calling in Call features (Video share,, Shared Sketch, Shared Maps)

R13-3-1-6 Dedicated service data channel (Extensions), and

R13-3-1-7 Service configuration information that may be relevant for the application (e.g. max number of participants in a Group Chat, max file

size of a File Transfer, warning threshold for a File Transfer, IM CAP ALWAYS ON, FT HTTP CAP ALWAYS ON, etc.).

R13-3-2 All RCS client implementations shall provide APIs to expose the services listed above to third parties.

R13-3-3 When a user installs an application that uses RCS APIs, the user shall be informed that the application will have access to his RCS services and features.

R13-3-4 Any application with access to the RCS services listed in R13-3-1-1 to R13-3-1-5 above is able to manage and display any event or communication associated with those services, no matter which application was used to generate the event.

R13-3-5 An application using its own dedicated service data channel to realise a specific feature shall only be able to exchange communications over this dedicated service data channel with other applications authorised to do so. Only such authorised applications shall be able to manage and display the associated communication streams.

US13-4 **As a user, I want to be able to use the application of my choice to handle my existing messaging services, ensuring that I am not overwhelmed with multiple notifications for the same incoming message or incoming event.**

R13-4-1 If more than one application on a device is able to handle the RCS messaging services listed in R13-3-1-1 to R13-3-1-5 above, then the user shall have the ability to choose which one is used as the “default messaging application”, i.e. the application used to notify the user of new incoming events and to be the default application used to create and send new events.

R13-4-2 If more than one application on a device is able to handle the same dedicated service data channel (extension), then all of the eligible applications will be able to handle the streams in a similar way (e.g. it could be that several applications notify the user of the same incoming communications stream).

R13-4-3 A user shall be notified once and only once for each incoming message or event for services listed in R13-3-1-1 to R13-3-1-5 above in order to avoid a confusing user experience.

NOTE: See chapter 2.3 for more detailed requirements on multiple client co-existence.

US13-5 **As a user, I want to be able to control which application(s) can access and use my RCS services.**

R13-5-1 An application wishing to use RCS APIs shall follow a verification process when it is installed on a device.

R13-5-2 During installation of an application that uses RCS APIs, the user shall be prompted to accept or reject the application’s use of RCS services.

R13-5-2-1 If the user accepts that the application can use RCS services, the application shall be able to access the RCS services listed above along with any communications history associated with these services.

R13-5-2-2 If the user rejects that the application can use RCS services, the application shall not be able to access nor use the RCS services listed above nor the communications history associated with these services.

US13-6 **As a user using an RCS-enabled app, I want to know which of my contacts has RCS services available to them on any of their devices.**

US13-7 **As a user I want to know which of my contacts share any new features or services that are provided to me by an application using a dedicated service data channel and be able to communicate with these contacts in the appropriate way.**

R13-7-1 An identifier shall be attributed to each of a developer's applications which will allow the application to use the device's RCS services as listed in R13-3-1-1 to R13-3-1-5 above.

R13-7-2 An application may create a dedicated data channel to provide a new service. In this case the service shall use an identifier that is used to refer to a new service. This identifier can be shared by other applications as soon as they are authorised to do so by the developer owning the identifier.

R13-7-3 It shall be possible for a developer to authorise several applications to use the same identifier.

US13-8 **As a developer, I want to ensure that users of my application are aware of other contacts supporting the underlying services so that they can communicate with them as much as possible.**

R13-8-1 A user with an application using RCS APIs shall be able to see, if appropriate, which of his contacts also has the same application and/or features provided by it.

R13-8-2 An RCS user exchanging capability information with other RCS users shall include information about any application using a dedicated service data channel API in the capability information shared. This will include capabilities for any applications running on the user's secondary device(s).

R13-8-3 An RCS application using RCS APIs shall be able to request information about the exact capabilities supported by some or all of the user's contacts.

R13-8-4 Capability information for applications on a contact's secondary device(s) shall also be discoverable.

R13-8-5 When an RCS application using a dedicated service data channel API is uninstalled from a device and that service data channel is not supported on any other of the user's devices, the capability information of that service is no longer advertised for that user.

US13-9 **As an operator, I want to open up my messaging and communications service experience to developers and third parties so that native applications can be enriched with new features.**

R13-9-1 Native RCS client implementations should provide APIs which allow third parties to enrich the native user interface with extra features and services.

US13-10 **As an operator, I want to be able to identify applications that use my RCS messaging and service data channel infrastructure and to be able to measure and record how much traffic and service usage is generated by each one.**

US13-11 **As an operator, I want to make sure that malicious applications using RCS service APIs cannot generate traffic and that any such malicious traffic shall not be transported across the network (i.e. blocked).**

US13-12 **As an operator, I want to make sure that malicious use by applications of my messaging and communications services infrastructure is prevented, for example to make sure that an application cannot masquerade as another.**

US13-13 **As an operator, I want to be able to identify traffic generated by applications using RCS APIs on a per identifier basis and revoke access to these APIs for applications using these identifiers.**

R13-13-1 Traffic generated by an application or service using RCS APIs shall be identifiable as such by the operator on a per identifier basis.

R13-13-2 An operator shall be able to revoke an application using a given identifier from access to all RCS features and functionality.

R13-13-3 Blocking or revoking applications using a given identifier from sending traffic shall not affect the user's ability to send authorised RCS service traffic from other applications or from their native RCS client.

3.13.3 Technical Information

3.13.3.1 Overview

There are two different enablers that can expose different types of RCS API

1. Device or Terminal API
2. Network API

This current version only covers Terminal API for RCS stack working on Android™ OS. Technical requirement matching for other mobile OS or for Network API will be completed in a future release of the Common Core.

The technical answers to the above requirements may have technical requirements on several elements of the end to end RCS infrastructure:

- The terminal and associated RCS stack exposing Terminal API
- The UNI / NNI interface
- The application using the Terminal API
- The service provider RCS infrastructure

3.13.3.2 Technical Implementation of User Stories and Service Requirements

R13-14-1 For Terminal API User stories US13-1 and US13-2, requirements R13-3-1 (with all its sub-requirements) and R13-3-2 are covered by the implementation of [RCC.53] at the device stack level that will enable developers to release new applications having access to RCS services.

NOTE: The Delivery Assurance feature, the new capabilities and the new service configuration parameters of this profile will be covered in an updated revision of [RCC.53].

R13-14-2 Requirement R13-3-3 is covered by the usage of a specific RCS permission as defined in section 4.4.3.5 of [RCC.53]. In order to use Terminal API, an application shall request this permission. At the installation, the user will be informed that the application requests to access to his RCS services and user will be able to grant it (or not).

R13-14-3 Requirement R13-3-4 is covered at the UNI level by following the procedures defined in section 3.12.4.1 of [RCS6.0] which enable an

application to set up a communication using an RCS service with any other RCS entity which does not have specifically the same application (assuming it supports the same service).

R13-14-4 Requirement R13-3-5 is covered at the UNI level by following the procedures defined:

- If the communication is messaged based, using the MSRP protocol, the stack shall follow the procedures defined in section 3.12.4.2.1.1 of [RCS6.0].
- If the communication is real time based, using the RTP protocol, the stack shall follow the procedures defined in section 3.12.4.2.1.2 of [RCS6.0]

At the terminal level, set up of a dedicated service data channel is enabled through the Multimedia Session API as per section 4.4.12 of [RCC.53]. Management and display only by authorised application is ensured by the implementation of security model defined in [RCC.55].

R13-14-5 Requirement R13-4-1 and requirement R13-4-3 are not covered yet in the current version of [RCC.53]. It will be covered in a future updated release of [RCC.53]

R13-14-6 Requirement R13-4-2 is covered by the terminal API architecture model as defined in section 3 and 4.1.2 of [RCC.53].

R13-14-7 Requirement R13-5-1 is covered by the verification process defined in section 5.3.6 of [RCC.55]. The result of this processing might be that the application is not valid, in which case it would not be permitted to use the RCS API.

R13-14-8 Requirements R13-5-2, R13-5-2-1 and R13-5-2-2 are covered by the usage of a specific Android™ permission for RCS service as defined in section 4.4.3.5 of [RCC.53]. In order to access and use Terminal API, an application shall request this permission that will be granted (or not) by the user during the application installation process.

R13-14-9 User stories US14-6, US13-7 and US13-8, and requirements R13-8-1 to R13-8-4 are covered at the device level by the Capability API defined in section 4.4.4 of [RCC.53] and at the UNI level by the capability discovery mechanism defined in section 2.6.1 of [RCS6.0].

R13-14-10 The identifier defined in requirement R13-7-1 and R13-7-2 rely on usage of IARI for third party application as per section 2.6.1.1.3 and 2.6.1.2.6 of [RCS6.0]. The way a developer gets a new IARI for its service is defined in section 3 of [RCC.55].

R13-14-11 Requirement R13-7-3 is covered by the authorization process described in section 5.3.4 of [RCC.55] which enable an IARI (tag) owner to authorize one or several applications to use a specific IARI.

R13-14-12 When an application is uninstalled, requirement R13-8-5 is covered at the stack level, by following the procedures defined in section 4.4.4.5 of [RCC.53]. At the UNI level, in case no other application is supporting the same service, procedures described in section 2.4.4.6 of [RCS6.0] to remove the Extension's IARI from the list of media feature tags carried in the Contact header of the SIP REGISTER request shall be applied.

R13-14-13 User story US13-9 and requirement R13-9-1 are covered by implementation of [RCC.53] combined with implementation of procedures defined in section 5 of [RCC.55].

R13-14-14 User story US13-10 and requirement R13-13-1 are ensured at the network level and would rely on the analysis of IARIs carried in the SIP signalling which identified the service which is generating traffic:

- Identification of the service generating a specific traffic may be done by linking the data plane with the SIP session that has allowed the data session establishment as the SIP INVITE request that was used to set the session shall convey the IARI tag set in the Contact header as described in section 3.12.4.1 and 3.12.4.2 of [RCS6.0]
- Identification of the service enabled on a specific device shall be done via the analysis of the SIP REGISTER request that conveys the IARI tag set in the Contact header as described in section 2.4.4.6 of [RCS6.0]

R13-14-15 For user story US14-11 and requirement R13-13-2 and R13-13-3, an operator can control dynamically the authorization of any app to access the RCS infrastructure, for any user, via the EUCR mechanism described in section 3.12.4.3 of [RCS6.0]. These network initiated requests indicate to the device to block a service (or a list of service) identified by a specific IARI for a certain duration (the duration can be unlimited). This implies that any application that would have been authorised by the IARI owner to use this IARI will no longer be able to generate traffic for this IARI. Triggering of the revocation procedures in the network is dependent on the service provider's policy on revocation procedures.

R13-14-16 User story US13-12 is covered by the set of procedures described in section 5 of [RCC.55] which ensured in particular that every IARI will be unique and that an application will not be able to masquerade itself as another.

3.15 Data Off

Users in many cases switch cellular data usage off locally on their device. To allow the Operator to offer IR 92 / IR 94 and RCS services to their users even in these use cases, the data off switch shall have an Operator configurable impact on the device connectivity. It shall be up to the individual Operator to ensure a good Operator service experience by the end user in cases that allow IP service usage even if the data switch was set to 'off' by the end user.

In order to limit the complexity of this Pre-Universal profile, this section is not mandatory for implementation for Pre-Universal profile devices and clients. However the OEM or application developer decides to allow for operator configured connectivity in cases the user has switched the data switch to off, then this section defines all necessary details.

There is a clear ambition to include requirements for "Data Off" situations as mandatory for implementation in the successor to this profile.

3.15.1 User Stories and Feature Requirements

US15-1 **As an operator, I want to be able to configure the device to use various technologies for the production of operator communication services even when the cellular data switch on the device is set to 'off'.**

R15-1-1 For the configuration of Operator voice, video and messaging services, the following technologies / bearers shall be considered in scope:

R15-1-1-1 CS call over 2G network,

R15-1-1-2 CS call over 3G network,

R15-1-1-3 VoLTE call over 4G network,

R15-1-1-4 SMS over 2G and 3G network (including services enabled by SMS),

R15-1-1-5 IR.92 SMS over 4G network (including services enabled by SMS),

R15-1-1-6 MMS over 2G and 3G network (including services enabled by SMS),

R15-1-1-7 MMS over 4G network (including services enabled by MMS),

R15-1-1-8 RCS Messaging over 2G, 3G, 4G network (including services enabled by RCS Messaging) inside and outside of a call),

R15-1-1-9 RCS File Transfer over 2G, 3G, 4G network (including services enabled by RCS File Transfer) inside and outside of a call,

R15-1-1-10 RCS Enriched Calling Pre-Call and Post-Call services over 3G and 4G networks

R15-1-1-11 Video Share and Image Share services inside an ongoing call over 3G, 4G networks,

R15-1-1-12 RCS IP Video Call over 3G, 4G network,

R15-1-1-13 IR.94 ViLTE over 4G network,

R15-1-1-14 Operator Provisioning over 2G, 3G, 4G networks.

R15-1-2 The availability of the services listed in requirement R15-1-1 shall be configurable on a per- Operator basis as per the table below.

	Service Behaviour On-Net	Service Behaviour in Roaming
CS Voice	Always on	Always on
SMS	Always on	Always on
VoLTE (IR.92)	Configurable	Configurable
PS xMS	Configurable	Configurable
RCS Messaging	Configurable	Configurable
RCS File Transfer	Configurable	Configurable
RCS Enriched Calling (Pre-call and Post call services)	Configurable	Configurable
Video Share, Image Share and Interactive In-Call services	Configurable	Configurable
ViLTE (IR.94)	Configurable	Configurable
Provisioning	Configurable	Configurable
PS data/Internet Access	Always off	Always off

Table 25: Summary of the availability of PS services over cellular networks when cellular DATA is set to OFF

3.15.2 Technical Information

3.15.2.1 Overview

The technical realisation of data off behaviour is applicable to devices in the following way:

- For embedded clients on primary devices using the IMS APN or HOS APN as defined in sections 2.2 and 2.9.1.4 of [RCS6.0] the complete behaviour is applicable via the Data Off functionality defined in section 2.9.1.5 of [RCS6.0]. In accordance with the definitions of section 2.2 of [RCS6.0] this includes downloadable clients that use terminal APIs to access the RCS functionality.
- For embedded clients on primary devices using the internet APN for RCS services as defined in section 2.9.1.5 of [RCS6.0] the behaviour is not applicable. It is

assumed that the availability of these services in case of data off is determined by the switch controlling the data connection with the internet APN

- For downloadable clients on primary devices, as defined in section 2.2 of [RCS6.0] the level of support of the behaviour depends on the level of integration with the native applications, which is limited by the permissions offered by the mobile OS or the OS platform API.
- Secondary devices: Those are access agnostic and as a result the behaviour described is not applicable to such clients. When the cellular data switch is switched off, they would have no data connectivity on cellular networks and as a result in those circumstances they shall not be able to offer any operator services on such networks.

3.15.2.2 Technical Implementation of User Stories and Service Requirements

For the implementation of the requirements in user story US15-1 the following applies:

R15-2-1 Communication services implemented on primary devices require an IP data connection. In accordance with the definitions in [RCS6.0] for RCS devices the data connection is provided in cellular access networks by bearers using the IMS and/or the HOS APN, both being independently available from the cellular data connection for generic use via the internet APN. Therefore the implementation of the requirements in US15-1 focus on the ability of the operator to disable the service based on service provider policy, although a bearer is available.

R15-2-2 CS call over 2G network and CS call over 3G network refer to the circuit switched telephony service. In accordance with the requirement for CS voice in Table 25, this service will be available regardless of the cellular data switch.

R15-2-3 VoLTE call over 4G network refers to the Multimedia Telephony service over LTE access defined in [PRD-IR.92]. The operator capability to disable/enable VoLTE as required in Table 25 is implemented by the configuration parameter VOLTE DATA OFF defined in section A.1.15 of [RCS6.0].

R15-2-4 SMS over 2G and 3G network refers to the SMS service over circuit switched networks, SMS over GPRS and SMS over SGs. In accordance with the requirement for SMS in Table 25, this service will be available regardless of the cellular data switch.

R15-2-5 IR.92 SMS over 4G network refers to the SMS over IP service. In accordance with the requirement for PS xMS in Table 25, the operator capability to disable/enable SMS over IP is implemented by the configuration parameter SMS over IP DATA OFF defined in section A.1.15 of [RCS6.0].

R15-2-6 MMS over 2G and 3G network and MMS over 4G network refers to the MMS service being access network agnostic, only requiring SMS to carry push notifications. In accordance with the requirement for PS xMS in Table 25, the operator capability to disable/enable MMS is implemented by the configuration parameter MMS DATA OFF defined in section A.1.15 of [RCS6.0].

R15-2-7 RCS Messaging over 2G, 3G, 4G network refers to the RCS messaging services 1-to.1 Chat, Group Chat and Standalone Messaging. The operator capability to disable/enable RCS Messaging as required in Table

25 is implemented by the configuration parameter RCS MESSAGING DATA OFF defined in section A.1.15 of [RCS6.0].
NOTE: This configuration does currently disable also the File Transfer via HTTP. With this an operator using File Transfer via HTTP is not able to disable chat or standalone messaging but enable File Transfer.

R15-2-8 File Transfer over 2G, 3G, 4G network refer to the RCS messaging services refers to the File Transfer service. The operator capability to disable/enable File Transfer as required in Table 25 is implemented by the configuration parameter FILE TRANSFER DATA OFF defined in section A.1.15 of [RCS6.0].

R15-2-9 RCS Enriched Calling Pre-Call and Post-Call services over 3G and 4G networks refer to Content Sharing Call Composer and Post-Call services. The operator capability to disable/enable RCS Enriched Calling as required in Table 25 is implemented by the configuration parameter PRE AND POST CALL DATA OFF defined in section A.1.15 of [RCS6.0].

R15-2-10 Video Share and Image Share services over 3G and 4G networks refer to Content Sharing Video Share and Image Share services. The operator capability to disable/enable RCS Enriched Calling as required in Table 25 is implemented by the configuration parameter CONTENT SHARE DATA OFF defined in section A.1.15 of [RCS6.0].

R15-2-11 Interactive In-Call services over 3G and 4G networks refer to Content Sharing Call Composer and Post-call services. The operator capability to disable/enable Interactive In-Call services as required in Table 25 is implemented by the configuration parameter CONTENT SHARE DATA OFF defined in section A.1.15 of [RCS6.0].

R15-2-12 IR.94 ViLTE over 4G networks refers to Conversational Video over LTE. The operator capability to disable/enable ViLTE (IR.94) as required in Table 25 is implemented by the configuration parameter IP VIDEO CALL DATA OFF defined in section A.1.15 of [RCS6.0].

R15-2-13 Operator Provisioning over 2G, 3G, 4G networks refers to Device Management. The operator capability to disable/enable Provisioning as required in Table 25 is implemented by the configuration parameter PROVISIONING DATA OFF defined in section A.1.15 of [RCS6.0].

R15-2-14 To enable Messaging for Multi Device an RCS client need to synchronize conversation history data for RCS messaging, File Transfer, SMS and MMS with the Common Message Store, consuming IP data. To complete the requirements in US15-1 the Operator should have the capability to disable/enable Conversation history synchronization via the configuration parameter SYNC DATA OFF defined in section A.1.15 of [RCS6.0].

Annex A Supporting Requirements

A.1 Personal Card format

Current implementations of the vCard standard by different device manufacturers leads today to data loss of certain contact information, when this information is exchanged among devices or synced with network address books. An RCS compliant device shall support receiving at a minimum, vCard 2.1 [vCard21] and vCard 3.0 formats [RFC2425], [RFC2426], and may support also the Personal Contact Card (PCC) format [CAB_TS].

The following fields are considered key fields. No data of these fields should be lost when contact information is exchanged by any means (peer to peer contact sent, uploaded, synchronised, etc.):

- Name
- Telephone numbers
- Email addresses
- Address information
- Personal information

The Minimum subtypes that should be supported are defined in the PCC definition in [CAB_TS]:

- Name: Composed names (such as “Jean-Baptiste”) shall be supported properly
- Personal Information
    - Nickname
    - Photo
    - Birthdate
    - Comment
- Telephone number: At least the following subtypes of telephone number shall be supported:
    - Land home
    - Land work
    - Land other
    - Mobile home
    - Mobile work
    - Mobile other
    - Fax work
    - Fax other
    - Beeper
    - Other

Email addresses: The following subtypes shall be supported:

1. Email work 1
2. Email work 2
3. Email home 1
4. Email home 2

5. Other

- Address information
    - Address
    - Geographic Position
    - Time zone

Sending and receiving a contact card via File Transfer is technically the same as sending any other file.

If the format for pushing a contact card file is vCard 2.1 or 3.0 formats, the MIME (Multipurpose Internet Mail Extensions) type that shall be used for the File Transfer is “text/vcard”.

If the format for pushing the contact card is CAB (Converged Address Book) 1.0 PCC XML format, then the CAB PCC MIME type “application/vnd.oma.cab-pcc+xml” shall be used.

On the receiving side, after the receiving RCS user accepts the contact card file delivered through File Transfer, the receiving RCS client shall apply the mapping of the RCS supported fields between the received format (CAB PCC XML for example) and the used format of the local address book database2.

vCard 3.0 format is recommended in RCS.

If the receiving side does not support the offered format identified in the a=file-selector attribute of the SIP INVITE SDP, it should reject the File Transfer invitation with an error response indicating it does not support the content-type, which then causes the sending side to initiate a second File Transfer, this time sending the contact card in a different format.

[2] If the conversion between PCC and vCard is required, please see [CAB_TS] section 5.4.3 “Format Adaptation”.

A.2 Emoticon conversion table

Standard Emoticons

Emoticons	Character sequences	Examples describing graphical renditions
Happy, smile	☺ or :)	A happy or smiling face
Sad	:-(or :(	A sad face
Wink	;-) or ;) or ;o) or ;O)	A winking face
Big grin	:-D or :D or :oD or :-d or :d or :od or :Od or :OD	A big grin face
Confused	:-/ or :-\	A confused face
Blushing, embarrassed	:”-) or :”) or :’> or :”> or :-$ or :$	A blushing, embarrassed face
Stick-out tongue	:-P or :P or :oP or :-p or :p or :op or :OP or :Op	A stick-out tongue face
Kiss, red lips	:-* or :*	A kissing face or red lips
Shocked, surprised	:-O or :-o or :o or :O	A shocked, surprised face
Angry	:-@ or :@ or X-(or X(or x-(or x(or xo(or XO(	An angry face
Cool, sunglasses	B) or B-) or (H) or (h) or Bo) or BO)	A face with sunglasses
Worried	:-S or :S or :-s or :s or :oS	A worried face
Devilish	>:-) or >:) or >:o) or >:O)	A devilish face
Crying	:,-(or :,(or :’-(or :’(or :,o(or :’o(or :,O(or :’O(	A crying face
Laughing	:-)) or :)) or :o)) or :O))	A laughing face
Straight face, disappointed	:-| or :| or :o| or :O|	A straight face
Angel, innocent	O:-) or O:) or o:-) or o:)	An innocent face
Nerd	:-B or :B	A nerdish face
Sleepy	|-O or |O or |-o or |o	A sleepy face
Rolling eyes	8-) or 8) or 8o) or 8O)	A rolling eyes face
Sick, ill	:-& or :& or ;o& or :O&	A sick/ill face
Shhh! No speak, lips sealed	:-SS or :SS or :ss or :-ss	A face with sealed lips
Thinking, pensive	:-? or :?	A pensive face
Raised eyebrow, sarcastic look	/:-) or /:) or /:o) or /:O)	A raised eyebrow face or a face with a sarcastic look
Rose, flower	@):-	A rose
Cup of coffee	~o)	A cup of coffee
Drink, cocktail	)-|	A cocktail glass
Idea (light bulb)	*-:-) or *-:)	A light bulb

Emoticons	Character sequences	Examples describing graphical renditions
Love struck, heart	(L) or <3	A heart
Beer	(b) or (B)	A pint of beer
Broken Heart	(u) or (U) or \Z/	A heart broken in two
rock on!	\m/	A smiling face with rockstar fingers
pirate	:ar!	A face with eye patch
silly	8-}	A face with wobbly mouth and spinning eyes
applause	=D>	A face with clapping hands
Penguin	<(')	A small penguin
Music Note	-8	A semi quaver
Star	(*)	A gold star
Clock	(o) or (O)	A clock face
Pizza	(pi) or (PI)	A slice of pizza or a whole pizza
Money	(mo) or (MO)	Coins or notes or coins and notes
Sheep	(bah) or (BAH)	A sheep
Pig	:8)	A pig's face
Sun	(#)	A shining sun
Rain Cloud	(st) or (ST)	A cloud with rain or cloud with rain drop
Umbrella	(um) or (UM)	An open umbrella
Aeroplane	(pl) or (PL)	A plane
Birthday Cake	(^)	A cake with candles
Party!	<:o)	A face wearing a party hat and blowing a party blower
Film	(~)	A roll of film or strip of film
Gift	(g) or (G)	A gift wrapped present with bow
Email	(e) or (E)	An open envelope
Phone	(t) or (T)	A hand receiver with cable
Wave	:-h	A face with hand waving
Big hug	>:D<	A face with hands hugging itself

A.3 Unicode Standard "Emoji" Emoticons

The list of required Emoji that must be graphically rendered and offered to the user, and the mapping to relevant Unicode blocks, is detailed in document "joyn Blackbird Unicode Standard Emoji Emoticons version 1.0", available from http://www.gsma.com/network2020/wp-content/uploads/2013/05/RCS-joyn-Blackbird-Unicode-Standard-emoji-emoticons-v1-0-2.pdf.

Annex B Configuration Parameters

This annex provides an overview of all configuration parameters that are applicable for the profile defined in this document with indications on whether client configurability is expected or whether clients can assume the parameter to always have a fixed value. Next to that, it indicates for parameters whether there is an aligned value for this profile even if for that parameter client configurability is still expected to allow for future evolution.

Parameter	Functional Definition	Syntax Definition for transport using [RCC.14]	Client Configurability	Aligned Value for this profile
IMS Parameters				
ConRef	[3GPP TS 24.167]	[RCC.07]	Fixed dummy value: *dummy.apn*	
PDP_ContextOperPref	[3GPP TS 24.167]	[RCC.07]	Fixed value: 0	
P-CSCF_Address	[3GPP TS 24.167]	[RCC.07]	Not instantiated	
Timer_T1	**[3GPP TS 24.167]**	[RCC.07]	Service provider configurable	
Timer_T2	[3GPP TS 24.167]	[RCC.07]	Service provider configurable	
Timer_T4	[3GPP TS 24.167]	[RCC.07]	Service provider configurable	
Private_user_identity	[3GPP TS 24.167]	[RCC.07]	Service provider configurable	
Public_user_identity	[3GPP TS 24.167]	[RCC.07]	Service provider configurable	

Parameter	Functional Definition	Syntax Definition for transport using [RCC.14]	Client Configurability	Aligned Value for this profile
Home_network_domain_name	[3GPP TS 24.167]	[RCC.07]	Service provider configurable Recommended to use ims.mnc<MNC>.mcc<MCC>.pub.3gppnetwork.org whereby <MNC> and <MCC> shall be replaced by the respective values of the home network in decimal format and with a 2-digit Mobile Network Code (MNC) padded out to 3 digits by inserting a 0 at the beginning (as defined in [PRD-IR.67]).	
ICSI_List	[3GPP TS 24.167]	[RCC.07]	Tree is instantiated, but no leafs shall be provided.	
LBO_P-CSCF_Address	[3GPP TS 24.167]	[RCC.07]	Tree is instantiated	
Address (LBO_P-CSCF_Address)	[3GPP TS 24.167]	[RCC.07]	Service provider configurable	
AddressType (LBO_P-CSCF_Address)	[3GPP TS 24.167]	[RCC.07]	Service provider configurable	
Resource_Allocation_Mode	[3GPP TS 24.167]	N/A	Not instantiated	
Voice_Domain_Preference_E_UTRAN	[3GPP TS 24.167]	[RCC.07]	Service Provider Configurable	
SMS_Over_IP_Networks_Indication	[3GPP TS 24.167]	[RCC.07]	Service Provider Configurable	
Keep_Alive_Enabled	[3GPP TS 24.167]	[RCC.07]	Service Provider Configurable	1
Voice_Domain_Preference_UTRAN	[3GPP TS 24.167]	N/A	Not instantiated	

Parameter	Functional Definition	Syntax Definition for transport using [RCC.14]	Client Configurability	Aligned Value for this profile
Mobility_Management_IMS_Voice_Termination	[3GPP TS 24.167]	[RCC.07]	Service Provider Configurable	
RegRetryBaseTime	[3GPP TS 24.167]	[RCC.07]	Service Provider Configurable	
RegRetryMaxTime	[3GPP TS 24.167]	[RCC.07]	Service Provider Configurable	
PhoneContext_List	[3GPP TS 24.167]	N/A	Tree not instantiated	
SS_domain_setting	[3GPP TS 24.167]	[RCC.07]	Service Provider Configurable	
PS_domain_IMS_SS_control_ preference	[3GPP TS 24.167]	[RCC.07]	Service Provider Configurable	
IMS Mode Authentication Type	[RCC.07]	[RCC.07]	Service Provider Configurable	
Realm	[RCC.07]	[RCC.07]	Service Provider Configurable	
Realm User Name	[RCC.07]	[RCC.07]	Service Provider Configurable	
Realm User Password	[RCC.07]	[RCC.07]	Service Provider Configurable	
tel or SIP URI – international	[RCC.07]	[RCC.07]	Service Provider Configurable	
tel or SIP URI - for non- international format	[RCC.07]	[RCC.07]	Service Provider Configurable	
Register Q-value	[RCC.07]	N/A	Not instantiated	
Transport Protocols: Signalling Cellular	[RCC.07]	[RCC.07]	Service Provider Configurable SIPoTLS recommended	
Transport Protocols: Signalling Roaming	[RCS5.3]	Implemented in the profile defined in this document in the transportProto sub tree of the OTHER MO based on the definition provided in [RCC.15]	Service Provider Configurable SIPoTLS recommended	

Parameter	Functional Definition	Syntax Definition for transport using [RCC.14]	Client Configurability	Aligned Value for this profile
Transport Protocols: Signalling Wi-Fi	[RCC.07]	[RCC.07]	Service Provider Configurable	SIPoTLS
Transport Protocols: Real Time Media Cellular	[RCC.07]	[RCC.07]	Service Provider Configurable SRTP recommended	
Transport Protocols: Real Time Media Roaming	[RCS5.3]	Implemented in the profile defined in this document in the transportProto sub tree of the OTHER MO based on the definition provided in [RCC.15]	Service Provider Configurable SRTP recommended	
Transport Protocols: Real Time Media Wi-Fi	[RCC.07]	[RCC.07]	Service Provider Configurable	SRTP
Transport Protocols: Discrete Media Cellular	[RCC.07]	[RCC.07]	Service Provider Configurable MSRPoTLS recommended	
Transport Protocols: Discrete Media Roaming	[RCS5.3]	Implemented in the profile defined in this document in the transportProto sub tree of the OTHER MO based on the definition provided in [RCC.15]	Service Provider Configurable MSRPoTLS recommended	
Transport Protocols: Discrete Media Wi-Fi	[RCC.07]	[RCC.07]	Service Provider Configurable	MSRPoTLS
RCS State Parameters				
RCS DISABLED STATE	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Service Provider Configurable	
Presence Parameters				

CLIENT-OBJ-DATA-LIMIT	[PRESENCE2MO]	N/A	Not instantiated	
CONTENT-SERVER-URI	[PRESENCE2MO]	N/A	Not instantiated	
SOURCE-THROTTLE-PUBLISH	[PRESENCE2MO]	N/A	Not instantiated	
MAX-NUMBER-OF-SUBSCRIPTIONS-IN-PRESENCE-LIST	[PRESENCE2MO]	N/A	Not instantiated	
SERVICE-URI-TEMPLATE	[PRESENCE2MO]	N/A	Not instantiated	
RLS-URI	[PRESENCE2MO]	N/A	Not instantiated	
PRESENCE PROFILE	[RCC.07]	[RCC.07]	Fixed Value: 0	
AVAILABILITY AUTHORISATION	[RCC.07]	N/A	Not instantiated	
FAVOURITE LINK CONTROL	[RCC.07]	N/A	Not instantiated	
FAVOURITE LINK URLS	[RCC.07]	N/A	Not instantiated	
FAVOURITE LINK LABEL MAX LENGTH	[RCC.07]	N/A	Not instantiated	
ICON MAX SIZE	[RCC.07]	N/A	Not instantiated	
NOTE MAX SIZE	[RCC.07]	N/A	Not instantiated	
LOCATION TEXT MAX LENGTH	[RCC.07]	N/A	Not instantiated	
LOCATION VALIDITY	[RCC.07]	N/A	Not instantiated	
MAX LOCATION UPDATE	[RCC.07]	N/A	Not instantiated	
PUBLISH EXPIRY TIME	[RCC.07]	N/A	Not instantiated	
VIP CONTACTS POLL MAX FREQUENCY	[RCC.07]	N/A	Not instantiated	
XDM parameters				
XCAP Root URI	[XDMMO]	N/A	Not instantiated	
XCAP Authentication user name	[XDMMO]	N/A	Not instantiated	
XCAP Authentication Secret	[XDMMO]	N/A	Not instantiated	
XCAP Authentication type	[XDMMO]	N/A	Not instantiated	
REVOKE TIMER	[RCC.07]	N/A	Not instantiated	
PNB MANAGEMENT	[RCC.07]	N/A	Not instantiated	

XDM CHANGES SUBSCRIPTION	[RCC.07]	N/A	Not instantiated	
Messaging parameters				
PRES-SRV-CAP	[RCC.12]	[RCC.07]	Fixed value: 0	
MAX_AD-HOC_GROUP_SIZE	[RCC.12]	[RCC.07]	Service Provider Configurable	50
CONF-FCTY-URI	[RCC.12]	[RCC.07]	Service Provider Configurable Recommended value: chat@conf-factory.<home-network-domain-name> Where <home-network-domain-name> is replaced with the Home Network Domain Name used by the client	
EXPLODER-URI	[RCC.12]	[RCC.07]	Fixed dummy value: *sip:foo@bar*	
CONV-HIST-FUNC-URI	[RCC.12]	[RCC.07]	Fixed dummy value: *sip:foo@bar*	
DEFERRED-MSG-FUNC-URI / MSG-STORE-URI	[RCC.12]	[RCC.07]	Fixed dummy value: *sip:foo@bar*	
DELETE-URI	[RCC.12]	[RCC.07]	Fixed dummy value: *sip:foo@bar*	
CHAT AUTH	[RCC.07]	[RCC.07]	Fixed Value: 1	
GROUP CHAT AUTH	[RCC.07]	[RCC.07]	Service Provider Configurable	Not instantiated
STANDALONE MGS AUTH	[RCC.07]	[RCC.07]	Fixed Value: 0	
IM CAP ALWAYS ON	[RCC.07]	[RCC.07]	Service Provider Configurable	
IM WARN SF	[RCC.07]	[RCC.07]	Service Provider Configurable	0
GROUP CHAT FULL STORE FORWARD	[RCC.07]	[RCC.07]	Fixed Value: 0	

GROUP CHAT INVITE ONLY FULL STORE FORWARD	[RCC.07]	[RCC.07]	Fixed Value: 0	
IM CAP NON RCS	[RCC.07]	[RCC.07]	Fixed Value: 0	
IM WARN IW	[RCC.07]	N/A	Not instantiated	
IM SMS FALLBACK AUTH	[RCC.07]	[RCC.07]	Service Provider Configurable	Not instantiated
IM SESSION AUTO ACCEPT	[RCC.07]	[RCC.07]	Service Provider Configurable	1
IM SESSION START	[RCC.07]	[RCC.07]	Service Provider Configurable	0
IM SESSION AUTO ACCEPT GROUP CHAT	[RCC.07]	[RCC.07]	Fixed Value: 1	
FIRST MSG IN INVITE	[RCC.07]	[RCC.07]	Fixed Value: 1	
IM SESSION TIMER	[RCC.07]	[RCC.07]	Service Provider Configurable	
MAX CONCURRENT SESSIONS	[RCC.07]	[RCC.07]	Service Provider Configurable	Not instantiated
MULTIMEDIA IN CHAT	[RCC.07]	[RCC.07]	Fixed Value: 0	
MAX SIZE 1-to-1 IM	[RCC.07]	[RCC.07]	Service Provider Configurable	3000 (bytes as defined in [RCC.07] section A.2.5)
MAX SIZE GROUP IM	[RCC.07]	[RCC.07]	Service Provider Configurable	3000 (bytes as defined in [RCC.07] section A.2.5)
MAX SIZE STANDALONE	[RCC.07]	N/A	Not instantiated	

MESSAGE STORE URL	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Service Provider Configurable If the service provider doesn't support the non-mandatory section 3.9, this parameter shall not be instantiated. Clients not supporting the non-mandatory section 3.9 shall ignore this parameter.	
MESSAGE STORE USER / PASSWORD	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Service Provider Configurable If the service provider doesn't support the non-mandatory section 3.9, this parameter shall not be instantiated. Clients not supporting the non-mandatory section 3.9 shall ignore this parameter.	
MESSAGE STORE AUTH	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Service Provider Configurable If the service provider doesn't support the non-mandatory section 3.9, this parameter shall not be instantiated. Clients not supporting the non-mandatory section 3.9 shall ignore this parameter.	

DATA CONNECTION SYNC TIMER	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Fixed Value: 0 If the service provider doesn't support the non-mandatory section 3.9, this parameter shall not be instantiated. Clients not supporting the non-mandatory section 3.9 shall ignore this parameter.	
MESSAGE STORE SYNC TIMER	[RCS6.0]	[RCS6.0]	Fixed Value: 0 If the service provider doesn't support the non-mandatory section 3.9, this parameter shall not be instantiated. Clients not supporting the non-mandatory section 3.9 shall ignore this parameter.	
MESSAGE STORE EVENT REPORTING	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Service Provider Configurable If the service provider doesn't support the non-mandatory section 3.9, this parameter shall not be instantiated. Clients not supporting the non-mandatory section 3.9 shall ignore this parameter.	

MESSAGE STORE ARCHIVE AUTH	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Service Provider Configurable If the service provider doesn't support the non-mandatory section 3.9, this parameter shall not be instantiated. Clients not supporting the non-mandatory section 3.9 shall ignore this parameter.	
SMS MESSAGE STORE	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Service Provider Configurable If the service provider doesn't support the non-mandatory section 3.9, this parameter shall not be instantiated. Clients not supporting the non-mandatory section 3.9 shall ignore this parameter.	
MMS MESSAGE STORE	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Service Provider Configurable If the service provider doesn't support the non-mandatory section 3.9, this parameter shall not be instantiated. Clients not supporting the non-mandatory section 3.9 shall ignore this parameter.	
CHAT MESSAGING TECHNOLOGY	[RCC.07]	[RCC.07]	Fixed Value: 0	

CHAT REVOKE TIMER	[RCS5.3]	Implemented in the profile defined in this document based on the definitions in [RCS5.3]	Service Provider Configurable	300
MESSAGING CAPABILITIES VALIDITY	[RCC.60]	Implemented in the profile defined in this document based on the definitions in [RCC.60]	Service Provider Configurable	Not instantiated
MESSAGING UX	[RCC.60]	Implemented in the profile defined in this document based on the definitions in [RCC.60]	Fixed Value: 1	
DELIVERY TIMEOUT	[RCC.60]	Implemented in the profile defined in this document based on the definitions in [RCC.60]	Service Provider Configurable	300
MESSAGING FALLBACK DEFAULT	Section 5.3	Implemented in the profile defined in this document based on the definitions in section 5.3	Service Provider Configurable	
RECONNECT GUARD TIMER	Section 5.3	Implemented in the profile defined in this document based on the definitions in section 5.3	Service Provider Configurable	
CFS TRIGGER	Section 5.3	Implemented in the profile defined in this document based on the definitions in section 5.3	Service Provider Configurable	0
File Transfer Parameters				
PROVIDE FT	[RCC.07]	[RCC.07]	Fixed Value: 1	
FT MAX SIZE	[RCC.07]	[RCC.07]	Service Provider Configurable	51200 (i.e. 50MB)
FT WARN SIZE	[RCC.07]	[RCC.07]	Service Provider Configurable	5120 (i.e. 5MB)

FT THUMB	[RCC.07]	[RCC.07]	Fixed Value: 0	
FT STANDFWD ENABLED	[RCC.07]	[RCC.07]	Fixed Value: 0	
FT CAP ALWAYS ON	[RCC.07]	[RCC.07]	Fixed Value: 0	
FT AUT ACCEPT	[RCC.07]	[RCC.07]	Service Provider Configurable	1
FT HTTP CS URI	[RCC.07]	[RCC.07]	Service Provider Configurable Recommended value: *ftcontentserver.rcs.mnc<MNC>.mcc<MNC>.pub.3gppnetwork.org* Whereby <MNC> and <MCC> shall be replaced by the respective values of the home network in decimal format and with a 2-digit MNC padded out to 3 digits by inserting a 0 at the beginning (as defined in [PRD-IR.67]).	
FT HTTP CS USER	[RCC.07]	[RCC.07]	Service Provider Configurable	
FT HTTP CS PWD	[RCC.07]	[RCC.07]	Service Provider Configurable	
FT DEFAULT MECH	[RCC.07]	[RCC.07]	Fixed Value: HTTP	
FT HTTP CAP ALWAYS ON	[RCC.60]	Implemented in the profile defined in this document based on the definitions in [RCC.60]	Service Provider Configurable	1
FT HTTP FALLBACK	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Service provider configurable	
Audio Messaging				

MAX RRAM DURATION	[RCS5.3]	N/A	Not instantiated	
Enriched Calling Related Parameters				
PROVIDE VS	[RCS5.3]	The implementation of the configuration parameter in [RCC.07] is replaced in the profile defined in this document by the implementation defined in [RCS5.3].	Service Provider Configurable	Set to value different from 0
PROVIDE IS	[RCS5.3]	The implementation of the configuration parameter in [RCC.07] is replaced in the profile defined in this document by the implementation defined in [RCS5.3].	Service Provider Configurable	1
ALLOW VS SAVE	[RCS5.3]	The implementation of the configuration parameter in [RCC.07] is replaced in the profile defined in this document by the implementation defined in [RCS5.3].	Fixed Value: 0	

VS MAX DURATION	[RCS5.3]	The implementation of the configuration parameter in [RCC.07] is replaced in the profile defined in this document by the implementation defined in [RCS5.3].	Service Provider Configurable	
IS MAX SIZE	[RCS5.3]	The implementation of the configuration parameter in [RCC.07] is replaced in the profile defined in this document by the implementation defined in [RCS5.3].	Service Provider Configurable	
COMPOSER AUTH	[RCC.20]	Implemented in the profile defined in this document based on definitions in [RCC.20]	Service Provider Configurable	1
SHARED MAP AUTH	[RCC.20]	Implemented in the profile defined in this document based on definitions in [RCC.20]	Service Provider Configurable	1
SHARED SKETCH AUTH	[RCC.20]	Implemented in the profile defined in this document based on definitions in [RCC.20]	Service Provider Configurable	1
POST CALL AUTH	[RCC.20]	Implemented in the profile defined in this document based on definitions in [RCC.20]	Service Provider Configurable	1

CALL COMPOSER TIMER IDLE	[RCC.20]	Implemented in the profile defined in this document based on definitions in [RCC.20]	Service Provider Configurable	
INCALL UX	[RCC.61]	Implemented in the profile defined in this document based on the definitions in [RCC.61]	Fixed Value: 0	
Geolocation Parameters				
Addr	[SUPLMO]	N/A	Not instantiated	
AddrType	[SUPLMO]	N/A	Not instantiated	
PROVIDE GEOLOC PUSH	[RCC.07]	[RCC.07]	Fixed Value: 1	
PROVIDE GEOLOC PULL	[RCC.07]	[RCC.07]	Fixed Value: 0	
GEOLOCATION TEXT MAX LENGTH	[RCC.07]	[RCC.07]	Service Provider Configurable	300
GEOLOCATION VALIDITY	[RCC.07]	N/A	Not instantiated	
GEOLOCATION PULL OPEN	[RCC.07]	N/A	Not instantiated	
GEOLOCATION PULL API GW	[RCC.07]	N/A	Not instantiated	
GEOLOCATION PULL BLOCK TIMER	[RCC.07]	N/A	Not instantiated	
Secondary Device parameters				
Control of Service Delivery	[RCC.07]	N/A	Not instantiated	
SMS-C Address	[RCC.07]	N/A	Not instantiated	
MMS-C Address	[RCC.07]	N/A	Not instantiated	
MMS/HTTP Proxy	[RCC.07]	N/A	Not instantiated	
Capability Discovery parameters				
POLLING PERIOD	[RCC.07]	[RCC.07]	Service Provider Configurable	0 (i.e. capability discovery polling disabled)
POLLING RATE	[RCC.07]	[RCC.07]	Service Provider Configurable	0

POLLING RATE PERIOD	[RCC.07]	[RCC.07]	Service Provider Configurable	0
CAPABILITY INFO EXPIRY	[RCC.07]	[RCC.07]	Service Provider Configurable	
NON RCS CAPABILITY INFO EXPIRY	[RCS5.3]	Implemented in the profile defined in this document based on definitions in [RCS5.3]	Service Provider Configurable	
CAPABILITY DISCOVERY MECHANISM	[RCC.07]	[RCC.07]	Fixed Value: 0	
CAPABILITY DISCOVERY VIA COMMON STACK	[RCC.07]	[RCC.07]	Not instantiated	
CAPABILITY DISCOVERY ALLOWED PREFIXES	[RCS5.3]	Implemented in the profile defined in this document based on definitions in [RCS5.3]	Service Provider Configurable	
APN parameters				
RCS-E ONLY APN	[RCC.07]	[RCC.07]	Service Provider Configurable	
ENABLE RCS-E SWITCH	[RCC.07]	[RCC.07]	Fixed Value: 1	
ALWAYS USE IMS APN	[RCC.60]	[RCC.07]	Service Provider Configurable	
End User Confirmation parameters				
END USER CONF REQ ID	[RCC.07]	[RCC.07]	Service Provider Configurable	
Multidevice configuration parameters				
uuid_Value	[RCC.07]	[RCC.07]	Service Provider Configurable and device dependent	
IP Voice and Video Call configuration				
PROVIDE IR94 VIDEO	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Service Provider Configurable	
PROVIDE RCS IP VOICE CALL	[RCC.07]	[RCC.07]	Fixed Value: 0	

PROVIDE RCS IP VIDEO CALL	[RCC.07]	[RCC.07]	Service Provider Configurable	
RCS IP VOICE CALL BREAK OUT	[RCC.07]	N/A	Not instantiated	
RCS IP VOICE CALL BREAK OUT CS	[RCC.07]	N/A	Not instantiated	
RCS IP VIDEO CALL UPGRADE FROM CS	[RCC.07]	[RCC.07]	Fixed Value: 0	
RCS IP VIDEO CALL UPGRADE ATTEMPT EARLY	[RCC.07]	[RCC.07]	Fixed Value: 0	
RCS IP VIDEO CALL UPGRADE ALLOWED ON CAPABILITY ERROR	[RCC.07]	[RCC.07]	Fixed Value: 0	
PROVIDE IR51 VOICE	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Service Provider Configurable	
PROVIDE IR51 VIDEO	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Service Provider Configurable	
VIDEO UX	[RCC.61]	Implemented in the profile defined in this document based on the definitions in [RCC.61]	Fixed Value: 0	
IR51 SWITCH UX	[RCC.61]	Implemented in the profile defined in this document based on the definitions in [RCC.61]	Service Provider Configurable	
DATA OFF parameters				

RCS MESSAGING DATA OFF	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Service Provider Configurable If the service provider doesn't support the non-mandatory section 3.15, this parameter shall not be instantiated. Clients not supporting the non-mandatory section 3.15shall ignore this parameter.	
FILE TRANSFER DATA OFF	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Service Provider Configurable If the service provider doesn't support the non-mandatory section 3.15, this parameter shall not be instantiated. Clients not supporting the non-mandatory section 3.15shall ignore this parameter.	
SMSOIP DATA OFF	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Service Provider Configurable If the service provider doesn't support the non-mandatory section 3.15, this parameter shall not be instantiated. Clients not supporting the non-mandatory section 3.15shall ignore this parameter.	

MMS DATA OFF	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Service Provider Configurable If the service provider doesn't support the non-mandatory section 3.15, this parameter shall not be instantiated. Clients not supporting the non-mandatory section 3.15shall ignore this parameter.	
CONTENT SHARE DATA OFF	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Service Provider Configurable If the service provider doesn't support the non-mandatory section 3.15, this parameter shall not be instantiated. Clients not supporting the non-mandatory section 3.15shall ignore this parameter.	
PRE AND POST CALL DATA OFF	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Service Provider Configurable If the service provider doesn't support the non-mandatory section 3.15, this parameter shall not be instantiated. Clients not supporting the non-mandatory section 3.15shall ignore this parameter.	

VOLTE DATA OFF	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Service Provider Configurable If the service provider doesn't support the non-mandatory section 3.15, this parameter shall not be instantiated. Clients not supporting the non-mandatory section 3.15 shall ignore this parameter.	
IP VIDEO CALL DATA OFF	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Service Provider Configurable If the service provider doesn't support the non-mandatory section 3.15, this parameter shall not be instantiated. Clients not supporting the non-mandatory section 3.15shall ignore this parameter.	
EXTENSIONS DATA OFF	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Service Provider Configurable If the service provider doesn't support the non-mandatory section 3.15, this parameter shall not be instantiated. Clients not supporting the non-mandatory section 3.15shall ignore this parameter.	

PROVISIONING DATA OFF	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Service Provider Configurable If the service provider doesn't support the non-mandatory section 3.15, this parameter shall not be instantiated. Clients not supporting the non-mandatory section 3.15shall ignore this parameter.	
SYNC DATA OFF	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Service Provider Configurable If the service provider doesn't support the non-mandatory section 3.15, this parameter shall not be instantiated. Clients not supporting the non-mandatory section 3.15shall ignore this parameter.	
API Parameters				
ALLOW RCS EXTENSIONS	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Service Provider Configurable If the service provider doesn't support the non-mandatory section 3.13, this parameter shall not be instantiated. Clients not supporting the non-mandatory section 3.13shall ignore this parameter.	

EXTENSIONS MAX MSRP SIZE	[RCS6.0]	Implemented in the profile defined in this document based on the definitions in [RCS6.0]	Service Provider Configurable If the service provider doesn't support the non-mandatory section 3.13, this parameter shall not be instantiated. Clients not supporting the non-mandatory section 3.13shall ignore this parameter.	
EXTENSIONS POLICY	[RCC.55]	Implemented in the profile defined in this document based on the definitions in [RCC.55]	Service Provider Configurable If the service provider doesn't support the non-mandatory section 3.13, this parameter shall not be instantiated. Clients not supporting the non-mandatory section 3.13shall ignore this parameter.	

Table 26: Overview of the applicable configuration parameters

Annex C Document Management

C.1 Document History

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
1.0	27/06/2016	New document	PSMC	Catherine Maguire / GSMA

C.2 Other Information

Type	Description
Document Owner	RCS Product Group
Editor / Company	Catherine Maguire / GSMA

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Your comments or suggestions & questions are always welcome.