



Rich Communication Suite 5.1 Endorsement of OMA CPM 1.0 Message Storage

Version 1.0

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1 Introduction

1.1 Overview

This document describes which sections of the OMA CPM 1.0 Message Storage specification (see [CPMMMSGSTORE]) are supported by RCS (Rich Communication Suite) 5.1.

For details on how this fits technically in this in the RCS scope see [RCS5.1].

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

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

In RCS, the message store will be used for two purposes:

- Long term, permanent storage/backup of messages the user wishes to store
- Temporary storage for sent/received messages in order to allow synchronization with devices that respectively didn't participate in the sending or were offline when the message was received

The latter messages will be stored by the participating function in conversations in the "default" system folder of the Message Store. Messages stored in conversations in that root folder will be removed from the storage by the server when they reach their expiry time.

Permanently stored messages (that is the user's message store) will be stored in conversations in a folder called "RCSMessageStore" or sub-folders thereof. "RCSMessageStore" will be a folder stored directly in the user's store i.e. a peer of the "default" system folder.

This leads to a Message Store structure as shown in the example in Figure 1:

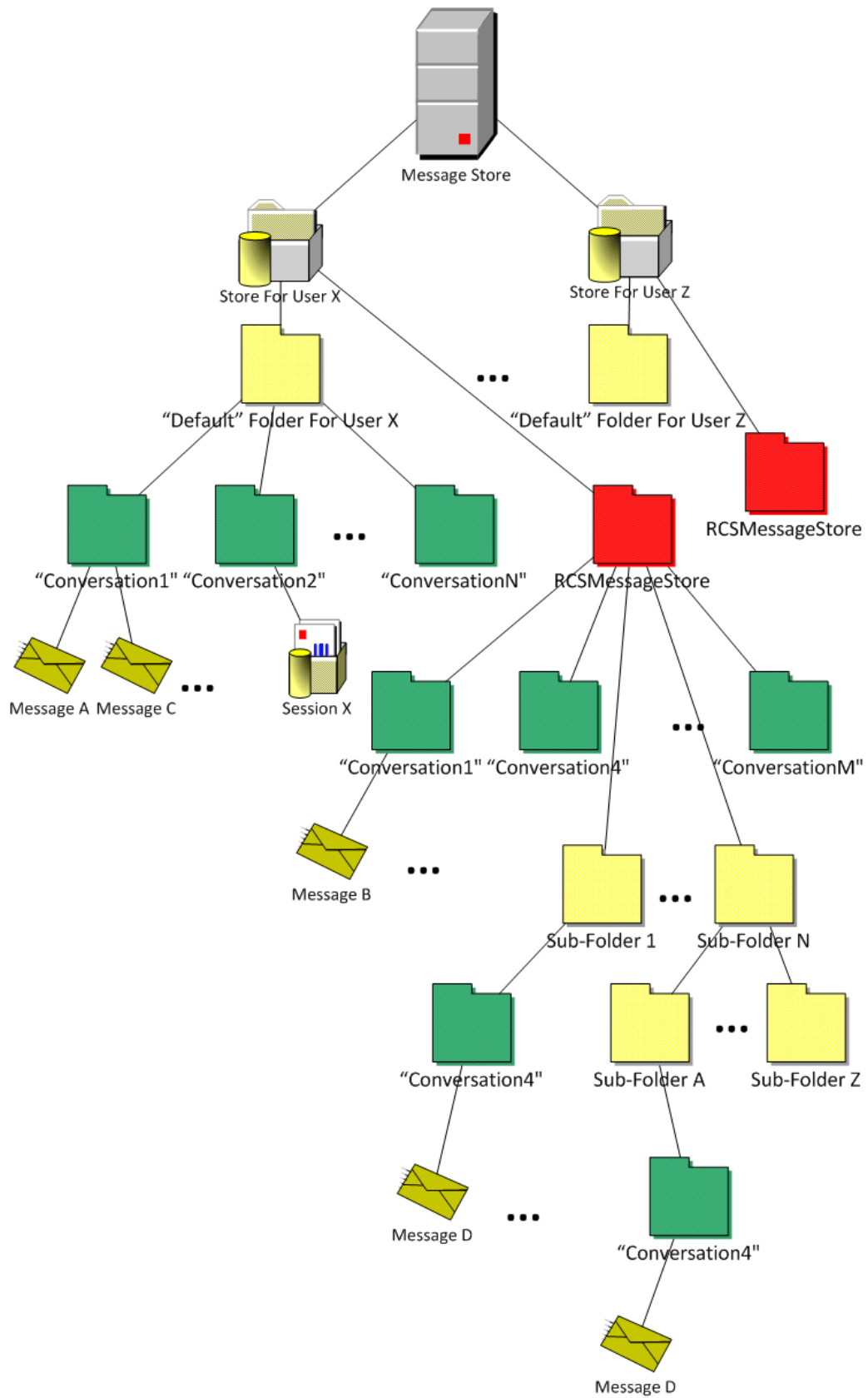


Figure 1: Message Store Example

As shown in the figure above, the store for the user contains the “default” system folder that contains only Conversation History Objects. The “RCSMessageStore” folder located at the same level as the “default” system folder can contain Conversation History Objects and

other folders. A folder hierarchy to organize the messages and session histories is thus only possible starting from the “RCSMessageStore” folder. The messages and session histories themselves are always stored in conversation history objects that correspond to the conversation in which the message or session history was sent. The same message or session history can occur multiple times in conversation history objects in different subfolders of the “RCSMessageStore” object. For messages or session histories stored in a conversation history that is directly in the “default” system folder, a copy will not exist in the RCS Message Store folder or its subfolders

From a user perspective the only difference between an object in a conversation history in the “default” system folder and a similar object in a conversation history in the “RCSMessageStore” folder is that he (or his client) has selected the latter object for permanent storage. An RCS client will therefore present those messages and session histories as if they were in the same location. That is in the example Message B will always be presented in the same conversational view as Message A and Message C.

1.2 Scope

This document provides the details of the storage interfaces used for the messaging technology in RCS.

1.3 Definition of Terms

Term	Description
ACL	Access Control List
CPIM	Common Presence and Instant Messaging
CPM	Converged IP Messaging
IMAP	Internet Message Access Protocol
MIME	Multipurpose Internet Mail Extensions
OMA	Open Mobile Alliance
PSK	Pre Shared Key
RCS	Rich Communication Suite
RTP	Real Time Protocol
SASL	Simple Authentication and Security Layer
TLS	Transport Layer Security
UID	Unique (Message) Identifier
URL	Uniform Resource Locator

1.4 Document Cross-References

Document	Name
[RCS5.1]	RCS5.1 - Advanced Communications: Services and Client Specification, Version 1.0, 13 August 2012 http://www.gsma.com/rcs/
[CPMMSGSTORE]	CPM Message Storage, Open Mobile Alliance Ltd. OMA-TS-CPM_MessageStorage-V1_0-20101012-C http://member.openmobilealliance.org/ftp/public_documents/COM/COM-CPM/Permanent_documents/OMA-TS-CPM_MessageStorage-V1_0-20101012-C.zip

2 References

See chapter 1.4.

3 Terminology and Conventions

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

4 Message Storage

Note: RCS 5.1 supports the following in the area of message storage

- Storage of Standalone CPM Messages
- Storage of CPM Session Histories including Group State Objects
- Storage of File Transfer Histories
- Storage of those as CPM Conversation Histories
- Storage of Media objects attached to CPM Messages
- Management of the storage objects
- Synchronization with the device's local Message store

RCS 5.1 does not support the following in the area of message storage:

- Storage of Stand-alone Media objects
- Authorization of other users to access the message store
- Search of storage objects by keywords

4.1 OMA CPM Version 1.0 Message Storage

Following differences with [CPMMSGSTORE]:

- In the storage objects, the storage of standalone Media objects is not applicable to RCS
- In the Operations, the folder operation for search is not applicable for RCS
- In the Operations, the stored object operation for preview is not applicable for RCS
- In the Operations, the management of access rights on stored objects is not applicable for RCS
- Notifications are not applicable for RCS

5 Common Procedures

5.1 Authorization and Authentication

No differences with [CPMMSGSTORE].

5.1.1 Authentication

No differences with [CPMMSGSTORE].

As a clarification for RCS:

- TLS/PSK-TLS (transport layer security / pre-shared key-transport layer security) will be used for RCS

5.1.2 Authorization

Following differences with [CPMMSGSTORE]:

- The extension with the possibility to define access control lists including the reference to the IMAPv4 (Internet Message Access Protocol) ACL (Access Control List) Extension is not applicable for RCS
- The use of the IMAP4 URLAUTH extension is not applicable for RCS

5.2 Storage Objects

Following differences with [CPMMSGSTORE]:

- The standalone media storage objects are not applicable for RCS

As a clarification for RCS:

- An RCS Message client will ignore unknown storage objects

5.2.1 Folder Object

No differences with [CPMMSGSTORE].

As a clarification for RCS:

- In RCS, the “default” system folder shall only contain Conversation History Objects (see section 5.2.5)
- At the same level in the user’s store as the “default” system folder there will be an “RCSMessageStore” folder

5.2.2 Message Object

No differences with [CPMMSGSTORE].

As a clarification for RCS:

- Message Objects will always be stored in their corresponding Conversation History Objects (see section 5.2.5)

5.2.3 Session History Object

Following differences with [CPMMSGSTORE]:

- Media sent using RTP (real time protocol) is not applicable for RCS

As a clarification for RCS:

- If no Date is provided in the SIP INVITE request the Date header shall be set to the date and time when the Session recording started
- Session History Objects will always be stored in their corresponding Conversation History Objects (see section 5.2.5)

5.2.3.1 *Application/X-CPM-Session Content Type Definition*

Following differences with [CPMMSGSTORE]:

- The inclusion of media-objects is not applicable for RCS. Only messages (possibly including multimedia content) are sent in RCS.
- In general, only messages (possibly including multimedia content) are stored for RCS, however for Group Chat, a new object called a Group State object is stored along with messages stored related to a Group Chat. The Group State object is an XML object with XML Content Type “application/group-state-object+xml” containing the Contribution-ID and the last valid focus Session Identify for the Group Chat, as well as the last set of active participants at the time the Group Chat was torn down because of inactivity. The format for the Group State object is shown in Table 1:


```

<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:xml="http://www.w3.org/XML/1998/namespace"
  elementFormDefault="qualified">
  <xs:import namespace="http://www.w3.org/XML/1998/namespace"
    schemaLocation="http://www.w3.org/2009/01/xml.xsd"/>
  <xs:element name="groupstate">
    <xs:complexType>
      <xs:attribute name="contributionid" type="xs:string" use="required">
      <xs:attribute name="lastfocussessionid" type="xs:string" use="required">
      <xs:attribute name="timestamp" type="xs:datetime" use="required">
      <xs:sequence>
        <xs:element name="participant" maxOccurs="unbounded">
          <xs:complexType>
            <xs:attribute name="name" type="xs:string" use="required">
            <xs:attribute name="number" type="xs:string" use="required">
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>

```

Table 1: Group State Object Format

Example:

```

<groupstate contributionid="af38db3" timestamp="2012-06-13T16:39:57-05:00"
lastfocussessionid="da9274453@company.com">
  <participant name="bob" number="tel:+16135551212"/>
  <participant name="alice" number="tel:+15195551212"/>
  <participant name="bernie" number="tel:+15145551212"/>
</groupstate>

```

Table 2: Group State Object Example

5.2.4 File Transfer History Object

Following differences with [CPMMSGSTORE]:

- The From will be set to the address of the initiator of the File Transfer retrieved from the authenticated originator's address in the SIP INVITE request
- If no Date is provided in the SIP INVITE request the Date header shall be set to the date and time when the File Transfer recording started

As a clarification for RCS:

- File Transfer History Objects will always be stored in their corresponding Conversation History Objects (see section 5.2.5)

5.2.4.1 Application/X-CPM-File-Transfer Content Type Definition

No differences with [CPMMSGSTORE].

As a clarification for RCS:

- As in each session only one file is transferred only one file-object element will be provided

5.2.5 Conversation History Object

Following differences with [CPMMSGSTORE]:

- Storage of Standalone media objects in a Conversation history object is not applicable for RCS

As a clarification for RCS:

- Objects stored in a Conversation History folder cannot be moved out of the folder to somewhere else. Move operations are applicable to the folder as a whole

5.2.6 Stand-alone Media Object

Not applicable for RCS

5.3 Identification of Storage Objects

No differences with [CPMMSGSTORE].

5.4 Notifications

Not applicable for RCS

5.5 Metadata Structure

Following differences with [CPMMSGSTORE]:

- The storage of metadata for standalone Media Objects in part 1 of the metadata model is not applicable for RCS
- The use of metadata annotations (part 2 of the meta data model) is not applicable for RCS
- The \$Forwarded and \$MDNSent flags are not applicable for RCS

As a clarification for RCS:

- An RCS message storage client shall ignore unknown flags

6 Procedures at Message Storage Client

Following difference with [CPMMSGSTORE]:

- The “ACL” IMAP4 extension defined in RFC 4314 is not applicable for RCS
- The “URLAUTH” IMAP4 extension defined in RFC 4467 is not applicable for RCS

As a clarification for RCS:

- The “ANNOTATE” IMAP4 extension defined in RFC 5257 is not applicable for RCS
- The “CONVERT” IMAP4 extension defined in RFC 5259 is not applicable for RCS
- The “METADATA” IMAP4 extension defined in RFC 5464 is not applicable for RCS

6.1 General Operations

6.1.1 Authenticate Operation

No differences with [CPMMSGSTORE].

As a clarification for RCS:

- If the user’s message store folder does not contain an “RCSMessageStore” folder at the same level as the “default” system folder when the client logs in for the first time, the client will create such a folder.

6.1.2 Set Active Folder Operation

No differences with [CPMMSGSTORE].

6.2 Access Control List Operations

Not applicable for RCS

6.3 Message and History Operations

6.3.1 Object Store Operation

Following difference with [CPMMSGSTORE]:

- The storage of standalone media objects is not applicable for RCS
- An RCS client will not store Message, File Transfer History or Session History Objects outside of a Conversation History
- An RCS client will only store Message, File Transfer History or Session History Objects in a Conversation History with a conversation id that matches the one of the object

As a clarification for RCS

- An RCS client using the Object Store operation will provide an initial set of metadata flags

- An RCS client using the Object Store operation will not provide a set of metadata annotations
- An RCS client will not store objects in Conversation Histories in the “default” system folder of the Message Store
- An RCS client shall not perform an Object Store Operation for a Message, File Transfer History or Session History Object, if for that Object there already exists an Object that has the same Conversation-ID and the same Contribution-ID in a Conversation History in the “default” system folder of the Message Store.
 - In this case, the client shall perform an Object Copy operation on the object stored in the Conversation History in the “default” system folder of the Message Store as described in section 6.3.4. This means that if a user wishes to permanently store an object that’s still in temporary storage, it is moved to permanent storage first.

6.3.2 Object Fetch Operation

Following difference with [CPMMSGSTORE]:

- The fetching of standalone media objects is not applicable for RCS
- The NOTE is not applicable for RCS: a client will always fetch the entire object rather than just parts of it.

6.3.3 Object Preview Fetch Operation

Not applicable for RCS

6.3.4 Object Copy Operation

Following difference with [CPMMSGSTORE]:

- The copying of standalone media objects is not applicable for RCS

As a clarification for RCS:

- Copying Objects is only possible to a conversation history with the same Conversation-ID
- An RCS client will not perform an Object Copy Operation for objects in Conversation Histories in the “default” system folder of the Message Store to a Conversation History in a sub-folder of the “RCSMessageStore” folder. Objects in Conversation Histories in the “default” system folder of the Message Store will only be copied to a Conversation History that resides directly in the “RCSMessageStore” folder.
- After performing an Object Copy Operation for objects in Conversation Histories in the “default” system folder of the Message Store, an RCS client will perform an Object Remove Operation for the Object in the Conversation History in the “default” system folder of the Message Store

6.3.5 Object Remove Operation

Following difference with [CPMMSGSTORE]:

- The removal of stored standalone media objects is not applicable for RCS

6.4 Folder Operations

6.4.1 Folder Create Operation

No differences with [CPMMSGSTORE].

6.4.2 List Folder Operation

No differences with [CPMMSGSTORE].

6.4.3 Folder Move Operation

No differences with [CPMMSGSTORE].

As a clarification for RCS:

- An RCS client will only move folders in the “default” system folder of the Message Store (that is Conversation Histories) to the “RCSMessageStore” folder.

- An RCS client will not move the “RCSMessageStore” folder

6.4.4 Folder Remove Operation

No differences with [CPMMSGSTORE].

6.4.5 Folder Search Operation

Not applicable for RCS

6.5 Reference Operations

Not applicable for RCS

6.6 Message and History Metadata Management Operations

6.6.1 Metadata Operation

No differences with [CPMMSGSTORE].

As a clarification for RCS:

- Updating of metadata annotations is not applicable for RCS

6.7 Synchronization

No differences with [CPMMSGSTORE].

As a clarification for RCS:

- An RCS client will present Message Objects in a Conversation History in the “default” system folder of the Message Store in the same (conversational) views as newly received messages albeit with the proper status
- An RCS client will present Message Objects in a Conversation History in the “RCSMessageStore” folder in the same (conversational) views as newly received messages albeit with the proper status
- If an RCS client finds that an object in a Conversation History in the “default” system folder of the Message Store has been deleted and the expiration time for that object is in the past, the client will not remove the object from its local storage

6.8 Notification Operations

Not applicable for RCS

7 Procedures at Message Storage Server

Following difference with [CPMMSGSTORE]:

- The “ACL” IMAP4 extension defined in RFC 4314 is not applicable for RCS
- The “URLAUTH” IMAP4 extension defined in RFC 4467 is not applicable for RCS

As a clarification for RCS:

- The “CONVERT” IMAP4 extension defined in RFC 5259 is not applicable for RCS
- The “METADATA” IMAP4 extension defined in RFC 5464 is not applicable for RCS

7.1 General Operations

7.1.1 Authenticate Operation

No differences with [CPMMSGSTORE].

7.1.2 Set Active Folder Operation

No differences with [CPMMSGSTORE].

7.2 Access Control List Operations

Not applicable for RCS

7.3 Message and History Operations

7.3.1 Object Store Operation

No differences with [CPMMSGSTORE].

As a clarification for RCS:

- The client's responsibility to keep proper conversation histories is not enforced by the server

7.3.1.1 Handling Deferred CPM Message Objects

Not applicable for RCS

7.3.2 Object Fetch Operation

No differences with [CPMMSGSTORE].

7.3.3 Object Preview Fetch Operation

Not applicable for RCS

7.3.4 Object Copy Operation

No differences with [CPMMSGSTORE].

As a clarification for RCS:

- The client's responsibility to keep proper conversation histories is not enforced by the server

7.3.5 Object Remove Operation

No differences with [CPMMSGSTORE].

As a clarification for RCS:

- The message storage server will remove objects from Conversation History objects in the "default" system folder of the Message Store that have expired according to a service provider policy
- The message storage server will remove Conversation History Objects that contain no Message, File Transfer History or Session History Objects any longer from the "default" system folder of the Message Store

7.4 Folder Operations

7.4.1 Folder Create Operation

No differences with [CPMMSGSTORE].

7.4.2 List Folders Operation

No differences with [CPMMSGSTORE].

7.4.3 Folder Move Operation

No differences with [CPMMSGSTORE].

7.4.4 Folder Remove Operation

No differences with [CPMMSGSTORE].

7.4.5 Folder Search Operation

Not applicable for RCS

7.5 Reference Operations

Not applicable for RCS

7.6 Metadata Update Operation

No differences with [CPMMSGSTORE].

As a clarification for RCS:

- The use of metadata annotations is not applicable for RCS

7.7 Message and History Synchronization Operations

No differences with [CPMMSGSTORE].

7.8 Notifications Operations

Not applicable for RCS

APPENDIX A. Change History

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

APPENDIX B. Static Conformance Requirements

Appendix not relevant for RCS

APPENDIX C. CPM-Defined IMAP Flag Extensions

C.1. \read-report-sent

No differences with [CPMMSGSTORE].

APPENDIX D. Example of Session History Object

No differences with [CPMMSGSTORE].

APPENDIX E. Example of File Transfer History Object

No differences with [CPMMSGSTORE].

Document Management

Document History

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1.0	13 Aug 2012	First version of the document based on Rich Communication Suite 5.0 Endorsement of OMA CPM 1.0 Message Storage Version 1.0 Approved by DAG and PSMC	PSMC	Tom Van Pelt/ GSMA

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