CPM Conversation Functions

Candidate Version 2.0 – 11 Jun 2013

Open Mobile Alliance

OMA-TS-CPM_Conv_Fnct-V2_0-20130611-C

Use of this document is subject to all of the terms and conditions of the Use Agreement located at http://www.openmobilealliance.org/UseAgreement.html.

Unless this document is clearly designated as an approved specification, this document is a work in process, is not an approved Open Mobile Alliance™ specification, and is subject to revision or removal without notice.

You may use this document or any part of the document for internal or educational purposes only, provided you do not modify, edit or take out of context the information in this document in any manner. Information contained in this document may be used, at your sole risk, for any purposes. You may not use this document in any other manner without the prior written permission of the Open Mobile Alliance. The Open Mobile Alliance authorizes you to copy this document, provided that you retain all copyright and other proprietary notices contained in the original materials on any copies of the materials and that you comply strictly with these terms. This copyright permission does not constitute an endorsement of the products or services. The Open Mobile Alliance assumes no responsibility for errors or omissions in this document.

Each Open Mobile Alliance member has agreed to use reasonable endeavors to inform the Open Mobile Alliance in a timely manner of Essential IPR as it becomes aware that the Essential IPR is related to the prepared or published specification. However, the members do not have an obligation to conduct IPR searches. The declared Essential IPR is publicly available to members and non-members of the Open Mobile Alliance and may be found on the "OMA IPR Declarations" list at http://www.openmobilealliance.org/ipr.html. The Open Mobile Alliance has not conducted an independent IPR review of this document and the information contained herein, and makes no representations or warranties regarding third party IPR, including without limitation patents, copyrights or trade secret rights. This document may contain inventions for which you must obtain licenses from third parties before making, using or selling the inventions. Defined terms above are set forth in the schedule to the Open Mobile Alliance Application Form.

NO REPRESENTATIONS OR WARRANTIES (WHETHER EXPRESS OR IMPLIED) ARE MADE BY THE OPEN MOBILE ALLIANCE OR ANY OPEN MOBILE ALLIANCE MEMBER OR ITS AFFILIATES REGARDING ANY OF THE IPR'S REPRESENTED ON THE "OMA IPR DECLARATIONS" LIST, INCLUDING, BUT NOT LIMITED TO THE ACCURACY, COMPLETENESS, VALIDITY OR RELEVANCE OF THE INFORMATION OR WHETHER OR NOT SUCH RIGHTS ARE ESSENTIAL OR NON-ESSENTIAL.

THE OPEN MOBILE ALLIANCE IS NOT LIABLE FOR AND HEREBY DISCLAIMS ANY DIRECT, INDIRECT, PUNITIVE, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE USE OF DOCUMENTS AND THE INFORMATION CONTAINED IN THE DOCUMENTS.

© 2013 Open Mobile Alliance Ltd. All Rights Reserved.
Used with the permission of the Open Mobile Alliance Ltd. under the terms set forth above.

Contents

Figures

No table of figures entries found.

Tables

1. Scope

This document provides the technical specifications for the conversation functionality of the CPM Enabler. The document covers the formats and procedures that Principals can use to exchange CPM Standalone Messages, CPM File Transfers and CPM Sessions. Also, it specifies how the CPM Standalone Messages, CPM File Transfers and CPM Sessions are linked to each other in CPM Conversations. The technical specifications are designed to fulfil the requirements, architecture and system concepts that are described in [OMA-CPM-RD], [OMA-CPM-AD] and [OMA-CPM-SD] respectively.

As such, these technical specifications provide the formal definitions of the CPM-PF1, CPM-PF2, and CPM-CF interfaces that have been identified in [OMA-CPM-AD]. Also, these technical specifications formally define the expected behaviour of the CPM Client, CPM Participating Function and CPM Controlling Function functional components that have been identified in [OMA-CPM-AD].

2. References

2.1 Normative References

[3GPP TS 24.229]	"IP Multimedia Call Control Protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP)", 3GPP, TS24.229, URL:http://www.3gpp.org/
[3GPP TS 26.141]	"IP Multimedia System (IMS) Messaging and Presence; Media formats and codecs", 3GPP, TS26.141, URL:http://www.3gpp.org/
[3GPP2 X.S0013.004]	"All-IP Core Network Multimedia Domain: IP Multimedia Call Control Protocol Based on SIP and SDP", 3GPP2, X.S0013.004, URL:http://www.3gpp2.org/
[RFC6135]	"An Alternative Connection Model for the Message Session Relay Protocol", C. Holmberg et al, June 2010, URL:http://www.ietf.org/rfc/rfc6135.txt
[draft-ietf-simple-msrp-sessmatch]	"Session Matching Update for the Message Session Relay Protocol (MSRP)", C. Holmberg et al, June 2010, URL:http://www.ietf.org/id/draft-ietf-simple-msrp-sessmatch-10.txt
[draft-referred-by]	"Updates to Referred-By in the Session Initiation Protocol (SIP)", S. Loreto et al, June 2010, URL:http://tools.ietf.org/html/draft-loreto-dispatch-3892bis-01
[GSMA IR.74]	"Video Share Interoperability Specification, 1.3", GSM Association, PRD IR.74 1.3, URL:http://www.gsmworld.com/documents/IR7413.pdf
[GSMA IR 84]	"Video Share Phase 2 Interoperability Specification, 1.0", GSM Association, PRD IR.84 1.0, URL:http://www.gsmworld.com/documents/IR.84v1_0.pdf
[GSMA IR.92]	"IMS Profile for Voice and SMS, 1.0", GSM Association, PRD IR.92 1.0, URL:http://www.gsmworld.com/documents/IR9210.pdf
[OMA-SIMPLE-IM]	"Instant Messaging using SIMPLE"; Open Mobile Alliance™, OMA-TS-SIMPLE_IM-V1_0, URL:http://www.openmobilealliance.org/
[OMA Client Provisioning]	"OMA Client Provisioning", Open Mobile Alliance™, OMA-ERP-ClientProvisioning-V1_1, URL:http://www.openmobilealliance.org/
[OMA-CPM-AD]	"Converged IP Messaging Architecture", Open Mobile Alliance™, OMA-AD-CPM-V2_0, URL:http://www.openmobilealliance.org/
[OMA-CPM-RD]	"Converged IP Messaging Requirements", Open Mobile Alliance™, OMA-RD-CPM-V2_0, URL:http://www.openmobilealliance.org/
[OMA-CPM-SD]	"Converged IP Messaging System Description", Open Mobile Alliance™, OMA-TS-CPM_System_Description-V2_0, URL:http://www.openmobilealliance.org/
[OMA-CPM_TS_MessageStorage]	"CPM Message Storage; Open Mobile Alliance ™, OMA-TS-CPM_MessageStorage -V2_0, URL:http://www.openmobilealliance.org/
[OMA DM]	"OMA Device Management Protocol", Open Mobile Alliance™, OMA-TS-DM_Protocol-V1_3, URL:http://www.openmobilealliance.org/
[OMA-PAP]	"Push Access Control", Open Mobile Alliance™, OMA-TS-PAP-V2_3, URL:http://www.openmobilealliance.org/
[OMA-POC]	"Push to talk Over Cellular", Open Mobile Alliance™, OMA-TS-PoC_System_Description-V2_1, URL:http://www.openmobilealliance.org/
[OMA-Push-Message]	"Push Message", Open Mobile Alliance™, OMA-TS-Push_Message-V2_3, URL:http://www.openmobilealliance.org/
[OMA-Push-OTA]	"Push over the Air", Open Mobile Alliance™, OMA-TS-PushOTA-V2_3, URL:http://www.openmobilealliance.org/
[OMA-XDM-AD]	"XML Document Management Architecture"; Open Mobile Alliance™, OMA-AD-XDM-V2_1, URL:http://www.openmobilealliance.org/

[OMA-XDM-Core]	"XML Document Management (XDM) Specification"; Open Mobile Alliance™, OMA-TS-XDM_Core-V2_1, URL:http://www.openmobilealliance.org/
[OMA-XDM-List]	"XML List Specification"; Open Mobile Alliance™, OMA-TS-XDM_List-V2_1, URL:http://www.openmobilealliance.org/
[OMA-XDM-Policy]	"Policy XDM Specification"; Open Mobile Alliance™, OMA-TS-XDM _Policy-V1_1, URL:http://www.openmobilealliance.org/
[OMA-XDM-Group]	"Group XDM Specification", Open Mobile Alliance™, OMA-TS-XDM_ Group-V1_1, URL:http://www.openmobilealliance.org/
[OMA-XDM-UPP]	"UPP Directory XDM Specification"; Open Mobile Alliance™, OMA-TS-XDM_UPP_Directory-V1_0, URL:http://www.openmobilealliance.org/
[OMA Provisioning Content]	"Provisioning Content", Open Mobile Alliance™, OMA-WAP-TS-ProvCont-V1_1 URL:http://www.openmobilealliance.org/
[RFC2046]	"Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types", N. Freed et al, November 1996, URL:http://www.ietf.org/rfc/rfc2046.txt
[RFC2119]	"Key words for use in RFCs to Indicate Requirement Levels", S. Bradner, March 1997, URL:http://www.ietf.org/rfc/rfc2119.txt
[RFC2183]	"Communicating Presentation Information in Internet Messages: The Content-Disposition Header Field", R. Troost et al, August 1997, URL:http://www.ietf.org/rfc/rfc2183.txt
[RFC2822]	"Internet Message Format", P. Resnick, April 2001, URL:http://www.ietf.org/rfc/rfc2822.txt
[RFC3261]	"SIP: Session Initiation Protocol", J. Rosenberg et al, June 2002, URL:http://www.ietf.org/rfc/rfc3261.txt
[RFC3264]	"An Offer/Answer Model with the Session Description Protocol (SDP) ", J. Rosenberg et al, June 2002, URL:http://www.ietf.org/rfc/rfc3264.txt
[RFC3265]	"Session Initiation Protocol (SIP)-Specific Event Notification", A. B. Roach, June 2002, URL:http://www.ietf.org/rfc/rfc3265.txt
[RFC3323]	"A Privacy Mechanism for the Session Initiation Protocol (SIP)", J. Peterson, November 2002, URL:http://www.ietf.org/rfc/rfc3323.txt
[RFC3325]	"Private Extensions to the Session Initiation Protocol (SIP) for Asserted Identity within Trusted Networks", C. Jennings et al, November 2002, URL:http://www.ietf.org/rfc/rfc3325.txt
[RFC3326]	"The Reason Header Field for the Session Initiation Protocol", H. Schulzrinne, December 2002, URL:http://www.ietf.org/rfc/rfc3326.txt
[RFC3420]	"Internet Media Type message/sipfrag", R. Sparks, November 2002, URL:http://www.ietf.org/rfc/rfc3420.txt
[RFC3428]	"Session Initiation Protocol (SIP) Extension for Instant Messaging", B. Campbell (Editor), December 2002, URL:http://www.ietf.org/rfc/rfc3428.txt
[RFC3501]	"Internet Message Access Protocol - Version 4rev1", M. Crispin, March 2003, URL:http://www.ietf.org/rfc/rfc3501.txt
[RFC3515]	"The Session Initiation Protocol (SIP) Refer Method", R. Sparks, April 2003, URL:http://www.ietf.org/rfc/rfc3515.txt
[RFC3550]	"RTP: A Transport Protocol for Real-Time Applications", H. Schulzrinne et al, July 2003, URL:http://www.ietf.org/rfc/rfc3550.txt
[RFC3680]	"A Session Initiation Protocol (SIP) Event Package for Registrations", J. Rosenberg, March 2004, URL:http://www.ietf.org/rfc/rfc3680.txt
[RFC3840]	"Indicating User Agent Capabilities in the Session Initiation Protocol (SIP)", J. Rosenberg et al, August 2004, URL:http://www.ietf.org/rfc/rfc3840.txt
[RFC3841]	"Caller Preferences for the Session Initiation Protocol (SIP)", J. Rosenberg et al, August 2004, URL:http://www.ietf.org/rfc/rfc3841.txt

[RFC3862]	"Common Presence and Instant Messaging (CPIM): Message Format", G. Klyne et al, August 2004, URL:http://www.ietf.org/rfc/rfc3862.txt
[RFC3903]	"Session Initiation Protocol (SIP) Extension for Event State Publication", A. Niemi (Editor), October 2004, URL:http://www.ietf.org/rfc/rfc3903.txt
[RFC3994]	Indication of Message Composition for Instant Messaging IETF RFC URL:http://tools.ietf.org/html/rfc3994
[RFC4028]	"Session Timers in the Session Initiation Protocol (SIP)", S. Donovan et al, April 2005, URL:http://www.ietf.org/rfc/rfc4028.txt
[RFC4122]	"A Universally Unique IDentifier (UUID) URN Namespace", P. Leach et al, July 2005, URL:http://www.ietf.org/rfc/rfc4122.txt
[RFC4353]	"Conferencing Framework with SIP", J. Rosenberg, February 2006, URL:http://www.ietf.org/rfc/rfc4353.txt
[RFC4483]	"A Mechanism for Content Indirection in Session Initiation Protocol (SIP) Messages", E. Burger (Editor), May 2006, URL:http://www.ietf.org/rfc/rfc4483.txt
[RFC4488]	"Suppression of Session Initiation Protocol (SIP) REFER Method Implicit Subscription", O. Levin, May 2006, URL:http://www.ietf.org/rfc/rfc4488.txt
[RFC4566]	"SDP: Session Description Protocol", M. Handley et al, July 2006, URL:http://www.ietf.org/rfc/rfc4566.txt
[RFC4575]	"A Session Initiation Protocol (SIP) Event Package for Conference State", J. Rosenberg et al, August 2006, URL:http://www.ietf.org/rfc/rfc4575.txt
[RFC4579]	"Session Initiation Protocol (SIP) Call Control - Conferencing for User Agents", A. Johnston et al, August 2006, URL:http://www.ietf.org/rfc/rfc4579.txt
[RFC4975]	"The Message Session Relay Protocol (MSRP)", B. Campbell (Editor), September 2006, URL:http://www.ietf.org/rfc/rfc4975.txt
[RFC5092]	"IMAP URL Scheme", A. Melnikov (Editor), November 2007, URL:http://www.ietf.org/rfc/rfc5092.txt
[RFC5318]	"The Session Initiation Protocol (SIP) P-Refused-URI-List Private-Header (P-Header) ", J. Hautakorpi et al, December 2008, URL:http://www.ietf.org/rfc/rfc5318.txt
[RFC5364]	"Extensible Markup Language (XML) Format Extension for Representing Copy Control Attributes in Resource Lists", M. Garcia-Martin et al, October 2008, URL:http://www.ietf.org/rfc/rfc5364.txt
[RFC5365]	"Multiple-Recipient MESSAGE Requests in the Session Initiation Protocol", M. Garcia-Martin et al, October 2008, URL:http://www.ietf.org/rfc/rfc5365.txt
[RFC5366]	"Conference Establishment Using Request-Contained Lists in the Session Initiation Protocol (SIP)", G. Camarillo et al, October 2008, URL:http://www.ietf.org/rfc/rfc5366.txt
[RFC5368]	"Referring to Multiple Resources in the Session Initiation Protocol (SIP)", G. Camarillo et al, October 2008, URL:http://www.ietf.org/rfc/rfc5368.txt
[RFC5438]	"Instant Message Disposition Notification (IMDN)", IETF RFC, URL:http://tools.ietf.org/html/rfc5438
[RFC5438Errata]	Instant Message Disposition Notification (IMDN) IETF RFC 5438 Errata ID 3013 URL:http://www.rfc-editor.org/errata_search.php?rfc=5438 (see also section **Error! Reference source not found.**)
[RFC5547]	"A Session Description Protocol (SDP) Offer/Answer Mechanism to Enable File Transfer", M. Garcia-Martin et al, May 2009, URL:http://www.ietf.org/rfc/rfc5547.txt
[RFC5626]	"Managing Client-Initiated Connections in the Session Initiation Protocol (SIP)", C. Jennings (Editor), October 2009, URL:http://www.ietf.org/rfc/rfc5626.txt
[RFC5627]	"Obtaining and Using Globally Routable User Agent URIs (GRUUs) in the Session Initiation Protocol (SIP)", J. Rosenberg, October 2009, URL:http://www.ietf.org/rfc/rfc5627.txt
[RFC5628]	"Registration Event Package Extension for Session Initiation Protocol (SIP Globally Routable User Agent URIs (GRUUs)", P. Kyzivat, October 2009, URL:http://www.ietf.org/rfc/rfc5628.txt

[RFC5806]	"Diversion Indication in SIP", S. Levy, March 2010, URL:http://www.ietf.org/rfc/rfc5806.txt
[RFC5876]	"Updates to Asserted Identity in the Session Initiation Protocol (SIP)", J. Elwell, April 2010, URL:http://www.ietf.org/rfc/rfc5876.txt
[OMA-SCRRULES]	"SCR Rules and Procedures", Open Mobile Alliance™, OMA-ORG-SCR_Rules_and_Procedures, URL:http://www.openmobilealliance.org/

2.2   Informative References

[OMADICT]	"Dictionary for OMA Specifications", Open Mobile Alliance™, OMA-ORG-Dictionary-V2_9, URL:http://www.openmobilealliance.org/
[OMA PDE]	"OMA Presence SIMPLE Data Extensions V1.3" , Open Mobile Alliance™, URL:http://www.openmobilealliance.org/
[OMA Pres]	"OMA Presence SIMPLE", Version 2.0, Open Mobile Alliance™, URL:http://www.openmobilealliance.org/

3. Terminology and Conventions

3.1   Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

All sections and appendixes, except "Scope" and "Introduction", are normative, unless they are explicitly indicated to be informative.

3.2   Definitions

Blacklist	A list of users that are blocked from performing a CPM functionality.
CPM 1-1 Session	See [OMA-CPM-SD].
CPM-based Service	See [OMA-CPM-AD].
CPM Ad-hoc Group	See [OMA-CPM-RD].
CPM Address	See [OMA-CPM-RD].
CPM Chat Message	See [OMA-CPM-RD].
CPM Closed Group Session	See [OMA-CPM-RD].
CPM Client	See [OMA-CPM-SD].
CPM Contribution Identity	See [OMA-CPM-SD].
CPM Controlling Function	See [OMA-CPM-AD].
CPM Conversation	See [OMA-CPM-RD].
CPM Conversation History	See [OMA-CPM-RD].
CPM Conversation Identity	See [OMA-CPM-SD].
CPM Group Session	See [OMA-CPM-RD].
CPM Group Session Identity	See [OMA-CPM-SD].
CPM Feature	A basic feature offered by the CPM Enabler (e.g. Pager Mode messaging, Large Message Mode messaging, session-based messaging, file transfer, deferred messaging, etc).
CPM Feature Tag	See [OMA-CPM-SD]
CPM File Transfer	See [OMA-CPM-SD].
CPM Long-lived Session	See [OMA-CPM-RD].
CPM Message	c
CPM Participating Function	See [OMA-CPM-AD].
CPM Pre-defined Group	See [OMA-CPM-RD].
CPM Session	See [OMA-CPM-RD].
CPM Session Invitation	See [OMA-CPM-RD].
CPM User	See [OMA-CPM-RD].
Deferred CPM Message	See [OMA-CPM-SD].
Device	See [OMADICT].
Enabler	See [OMADICT].
Group State Object	See [OMA-CPM-SD]
Large Message Mode	See [OMA-CPM-AD]

Interworking Function	See [OMA-CPM-AD].
Interworking Selection Function	See [OMA-CPM-AD].
Group XDMS	See [OMA-XDM-AD].
Join-in Group	See [OMA-XDM-Group].
Large Message Mode	See [OMA-CPM-AD].
Media	See [OMA-CPM-RD].
Media Object	See [OMA-CPM-AD].
Media Plane	See [OMA-CPM-AD].
Media Stream	As defined in [RFC3264].
Message Storage Server	See [OMA-CPM-AD].
Pager Mode	See [OMA-CPM-AD]
Participant	See [OMADICT].
Participant Information	See [OMA-CPM-SD].
Principal	See [OMADICT].
Pseudonym	See [OMA-CPM-RD].
Registration Event Information	See [OMA-CPM-SD].
Signalling Path	See [OMA-CPM-SD].
Unique User Agent Identifier	See [OMA-CPM-SD].
User Preferences Profile	See [OMA-CPM-RD].

3.3   Abbreviations

3GPP	See [OMADICT]
3GPP2	See [OMADICT]
ABNF	See [OMADICT]
B2BUA	See [OMADICT]
CPIM	Common Presence and Instant Messaging
CPM	See [OMADICT]
GRUU	Globally Routable User Agent URI
IETF	See [OMADICT]
IMAP	See [OMADICT]
IMDN	See [OMADICT]
IMS	See [OMADICT]
ISF	See [OMADICT]
IWF	See [OMADICT]
IP	See [OMADICT]
MIME	See [OMADICT]
MSRP	See [OMADICT]
OMA	See [OMADICT]
OMNA	Open Mobile Naming Authority
RFC	See [OMADICT]

RTP	Real-time Transport Protocol
RTCP	RTP Control Protocol
SCR	Static Conformance Requirements
SDP	See [OMADICT]
SIMPLE	See [OMADICT]
SIP	See [OMADICT]
TCP	See [OMADICT]
UA	User Agent
UAC	User Agent Client
UAS	User Agent Server
UDP	User Datagram Protocol
URI	See [OMADICT]
URL	See [OMADICT]
WAP	See [OMADICT]
XDM	See [OMADICT]
XDMS	See [OMADICT]
XML	See [OMADICT]

Note: Abbreviations defined in the OMA Dictionary complements this section.

4. Introduction

The Converged IP Messaging (CPM) Enabler provides the convergence of multimedia communication services which accommodate different user experiences such as deferred and immediate messaging, session-based messaging, and half duplex/full duplex conferencing, while leveraging standardized service functionalities from existing communication Enablers like Instant Messaging [OMA-SIMPLE-IM] or Push to talk over Cellular [OMA-POC].

The CPM Enabler provides a framework by defining a horizontal Enabler built on top of a SIP/IP core infrastructure. This framework comprises a set of functional components and interfaces that have been designed to facilitate easy deployment of existing and future communication services. The components of the CPM Enabler are independently reusable. The set of functions interact with one another via the framework provided by the CPM Enabler. The CPM Enabler offers multimedia communication functionalities and can be used to build Services, a.k.a. CPM-based Services. An instantiation of a CPM communication can have one or more media types.

All CPM-based Services will use the functional components and interfaces provided by the framework. Non-CPM Communication Services require Interworking Functions that provide adaptation/mapping between the CPM Enabler and the different technologies of these Non-CPM Communication Services to communicate with the framework.

4.1   CPM Version 1.0

CPM Enabler version 1.0 Conversation Function offers:

- Registration

    o   handling 3rd party CPM service registrations

    o   handling Registration Event Information

- CPM Client function, CPM Participating Function, CPM Controlling Function

- CPM Standalone Message handling

    o   sending/receiving Pager Mode CPM Standalone Message, Large Message Mode CPM Standalone Message

    o   with/without disposition notifications

    o   immediate/deferred delivery of CPM Standalone Message

- CPM 1-1 Session handling

    o   initiating/receiving/modifying/closing CPM 1-1 Session

    o   media plane handling

    o   extending CPM 1-1 Session to CPM Group Session

- CPM Group Session handling

    o   initiating/receiving/modifying/closing CPM Group Session for CPM Ad-hoc Groups and CPM Pre-defined Groups

    o   media plane handling

    o   adding/removing users at any time during a CPM Session

    o   receiving participant information

- CPM File Transfer

o   initiating/receiving/rejecting CPM File Transfer

- supports discrete (e.g. text, image, video clip, audio clip, voice clip, binary file) Media Types and continuous (e.g. bidirectional voice, streaming video) Media Stream Types

- supports multiple device environment

- applying appropriate User Preferences Profiles among several User Preferences Profiles like Office, Home, Meeting, etc. to which the preferences of the CPM User are associated for message delivery

- supports if interworking decision with Non-CPM Communication Services is required or not

- recording of CPM Standalone Messages, CPM File Transfers and CPM Sessions, including any Media Objects attached to them in a network-based storage subject to the preferences of the CPM User and service provider policies

4.2   CPM Version 2.0

CPM Enabler version 2.0 Conversation Function adds the following enhancements:

- CPM Standalone Message handling:

  o   Enhanced multi-device functionality for sending imdn notifications (delivery notifications and read reports) towards the device that originated the CPM Standalone Message

- CPM 1-1 and Group Session handling:

  o   Support for notifications within the chat such as "isComposing" and disposition notifications (i.e. delivered, displayed);

  o   Storing of chat messages and associated notifications while a chat participant is not available (e.g. lost coverage, not registered in IMS) or missed chat;

  o   Delivery of stored chat messages and disposition notifications once the recipient becomes available;

  o   Enhanced multi-device functionality for chat (forking in case of auto-answer);

  o   Support for live recording of chat messages;

  o   Support Closed Group Session;

  o   Support Long-lived Group Session;

  o   Interworking over the NNI with SIMPLE IM V2.0 chat

- File transfer:

  o   Support for file size, file name, and type in a CPM File Transfer request.

  o   Define a maximum file size policy.

  o   Support CPM File Transfer while having an ongoing CPM Session.

  o   Support CPM File Transfer to off-line recipients

  o   Support File Transfer resume by either sender or recipient

  o   Support thumbnail in the invitation of the content to be transferred

- Backward compatibility of version 2.0 with CPM Version 1.0 excludes support of session history object as defined in CPM version 1.0. This has been replaced in CPM version 2.0 by the session history folder and session info object.

- Addition of sip.instance mechanism for multi-device support, for:

  o   delivery of disposition notifications to the CPM User device that has originated the message for which the associated IMDN is being delivered, and

o deferred delivery of chat, group chat messages, File Transfer and associated disposition notifications to the same CPM User's device on which the invitation was originally accepted, before being involuntarily disconnected during the SIP session.

5. Format of CPM Conversation Items

5.1 CPM Standalone Message

A CPM Standalone Message is either a Pager Mode CPM Standalone Message carried in a SIP MESSAGE request as described in [RFC3428] or a Large Message Mode CPM Standalone Message. The size of a Pager Mode CPM Standalone Message should not exceed 1300 bytes. If a CPM Standalone Message is larger than 1300 bytes, the contents of the message are not inserted into the SIP MESSAGE request but are carried via MSRP as defined in [RFC4975]. In that case, a SIP session is established between the interested parties (sender and all receivers) with MSRP as the Media Stream. The CPM Standalone Message contents are then transmitted via MSRP, using chunking if necessary. This SIP session should *not* be confused with a CPM Session as no CPM Session is established. The SIP session is only used to transmit exactly one Large Message Mode CPM Standalone Message after which the SIP session is torn down. The CPM Standalone Message contents are contained in a CPIM wrapper as defined in [RFC3862].

5.2 CPM Session

A CPM Session uses SIP session functionality as defined by [RFC3261] to exchange multimedia content as well as CPM Chat Messages between two or more CPM Users or between CPM Users and non-CPM Principals. A CPM Session can be established between two Principals as a CPM 1-1 Session or between several Principals as a CPM Group Session. In the latter case, a CPM Controlling Function acts as a conference focus as defined by [RFC4353].

A CPM 1-1 Session can be extended by one of the Participants to a CPM Group Session as described in section 7.3.3 "*Extending a CPM 1-1 Session to a CPM Group Session*".

A CPM User can invite other CPM and non-CPM Principals to a CPM Session. The invitees are either members of a CPM Pre-defined Group or a number of ad-hoc recipients that the CPM User selects dynamically. A CPM Pre-defined Group is a "Shared Group" as described in [OMA-XDM-Group]. Ad-hoc recipients are carried as a 'recipient-list' body in the SIP INVITE request as described in [RFC5366].

The duration of a CPM Session depends on whether it is a CPM 1-1 Session or a CPM Group Session. In the case of a CPM 1-1 Session, the session is terminated when one of the two Participants leaves the session. In the case of a CPM Group Session for a CPM Ad-hoc Group, the session usually ends when the session initiator ends the session. In the case of a CPM Group Session for a CPM Pre-defined Group, the ending of the session depends on the conditions set in the policy of that group as described in [OMA-XDM-Group].

Following notifications are provided for CPM Chat Messages:

- "isComposing",
- delivery notifications and,
- read reports notifications

to the CPM User's device that has sent the CPM Chat Message.

The delivery notifications and read reports are stored also as part of the Conversation History that includes the CPM Session.

 The delivery notifications and read reports can be sent within the CPM Session, or outside of the CPM session if they are generated after the CPM Session was terminated.

The "isComposing" notifications are generated during the CPM Session according to the rules and procedures of [RFC3994]. A CPM Client receiving a MSRP SEND message holding an "isComposing" status SHOULD change the "isComposing" status of the sender according to the rules and procedures of [RFC 3994].

In a CPM Session, "isComposing" status SHALL be sent without CPIM wrapper and therefore no delivery and/or display notification shall be requested.

The originating CPM Participating Function SHALL always set the CPIM "DateTime" header value in the CPM Chat Messages it receives. The CPM Participating Function SHALL also set the CPIM "DateTime" header value and IMDN

"DateTime" element in notifications. In both cases, the CPM Participating Function SHALL overwrite any "DateTime" information provided by the CPM Client. A CPM Client receiving these CPM Chat Messages SHOULD therefore rely on these headers fields to contain the correct time, and can for example use the provided information to ensure correct ordering of the sent and received CPM Chat Messages and CPM notifications (i.e. disposition notifications and/or "isComposing"). The CPM Client SHOULD perform any timezone conversions, if necessary.

5.2.1 SDP Contents for CPM Sessions

5.2.1.1 SDP Contents when Initiating or Modifying a CPM Session

An initiating entity (e.g. a CPM Client, CPM Participating Function or an IWF) SHALL populate the SDP of a CPM Session Invitation or a CPM Session modification request to match the Media Streams that are needed to be set up, deleted or modified. Therefore the initiating entity SHALL include in the SIP INVITE request a MIME SDP body as an SDP offer according to the rules and procedures of [RFC4566] and [RFC3264]. The SDP offer SHALL contain media descriptions matching the requested Media Streams according to the following clarifications:

- When including an offer for a Media Stream for CPM Chat Messages, using MSRP, the initiating entity SHALL include a media description according to the rules and procedures of [RFC4975].

- When including an offer for a Media Stream for real-time continuous Media, using RTP/RTCP, the initiating entity SHALL include a media description according to the rules and procedures of [RFC3264] and [RFC3550].

- When including an offer for a Media Stream of another Media Stream Type, the initiating entity SHALL follow the respective standard for that Media Stream Type.

In the case of CPM Session modification, the modified SDP SHALL follow the rules and procedures for modifying a session described in [RFC3264].

When the SIP/IP core corresponds with 3GPP/3GPP2 IMS, the SDP offer SHALL also adhere to the rules and procedures described in [3GPP TS 24.229] / [3GPP2 X.S0013.004] and described in [GSMA IR.92].

An initiating entity (e.g. a CPM Client or an IWF) requesting an "isComposing" notification for one or more CPM Chat Messages SHALL populate in the SDP of the SIP INVITE request and response the value *"application/im-iscomposing+xml"* in the *a=accept-types* attribute as described in [RFC 3994].

When requesting a disposition notification for one or more CPM Chat Messages, an initiating entity (e.g. a CPM Client, CPM Participating Function or an IWF) SHALL also populate in the SDP of the SIP INVITE request and response the value *"message/imdn+xml"*, in the *a=accept-wrapped-types* attribute as per rules and procedures of [RFC5438] and [RFC5438Errata].

5.2.1.2 SDP Handling at Intermediate Nodes

Intermediate nodes (e.g. a CPM Participating Function, a CPM Controlling Function or an ISF) SHALL include the contents of the SDP they received in the SDP they send out, in accordance with the rules and procedures of [RFC3264]. Specific attributes in the SDP MAY be modified for the following reasons:

- To remove or modify media descriptions that are not allowed according to service provider policies or CPM Group policy or user preferences.
- To modify IP-address and port information to insert the intermediate entity in the media path of the session.

All modifications SHALL be according to the rules and procedures of [RFC3264] and the respective Media Stream standards (i.e. [RFC4975] for MSRP-based media description and [RFC3264] and [RFC3550] for RCP/RTCP-based media descriptions).

5.2.1.3 SDP Handling at Terminating Nodes

A terminating entity (e.g. a CPM Client or an IWF) SHALL process an incoming SDP and accept, modify or reject the Media Streams requested in the incoming SDP as defined by [RFC3264]. The terminating entity SHALL handle the media descriptions according to the following clarifications:

- Media descriptions for a Media Stream for CPM Chat Messages, using MSRP, SHALL be handled and responded to according to the rules and procedures of [RFC4975].

- Media descriptions for a Media Stream for real-time continuous Media, using RTP/RTCP, SHALL be handled and responded to according to the rules and procedures of [RFC3264] and [RFC3550].

- Media descriptions for a Media Stream of another Media Stream Type SHALL be handled and responded to according to the respective standard for that Media Stream Type.

The SDP handling for disposition notifications SHALL follow the rules and procedures of [RFC5438].

5.3   CPM Conversation Identification

In order to support the concept of CPM Conversations and a threaded view of a CPM Conversation History, three new SIP headers fields have been defined:

- Conversation-ID: this is a header field that identifies the CPM Conversation Identity that is associated with CPM Standalone Messages, CPM File Transfers and CPM Sessions. All CPM Standalone Messages, CPM File Transfers and CPM Sessions belonging to the same CPM Conversation carry the same value for the Conversation-ID header field. All CPM notifications, such as delivery and read reports, that are sent for CPM Chat Messages after the CPM Session was terminated, SHALL carry the CPM Conversation Identity of the respective CPM Session.

- Contribution-ID: this is a header field that identifies the CPM Contribution Identity of an individual CPM Standalone Message, CPM File Transfer or CPM Session and disposition notification that is part of a CPM Conversation.

- InReplyTo-Contribution-ID: this is a header that, in case of a reply to an earlier received CPM Standalone Message, CPM File Transfer or CPM Session, identifies the Contribution-ID of the CPM Standalone Message, CPM File Transfer or CPM Session that is being replied to. A CPM File Transfer sent within a CPM Session uses the value of the Contribution-ID of the CPM Session in the InReplyTo-Contribution-ID header field.

Appendix C "*CPM-defined SIP Header* fields" contains a formal definition of these three SIP header fields.

These three SIP header fields are preserved unchanged end-to-end. They SHALL NOT be modified or deleted by any intermediate node in any CPM communication.

The three header fields SHALL be carried in Pager Mode CPM Standalone Messages and disposition notifications (realized over SIP MESSAGE request) and the session invitations of Large Message Mode CPM Standalone Messages, CPM File Transfers and CPM Sessions (SIP INVITE request). All CPM functional components SHALL support these SIP header fields.

5.4   Disposition Notifications

The disposition notification mechanism in CPM is an extension to the specification in [RFC5438] and [RFC5438Errata]. The extension is that an original message requesting disposition notification can be also sent using a MSRP SEND request in case of Large Message Mode CPM Standalone Message and of CPM Chat Message, and of CPM File Transfer when disposition notification is sent within the CPM Session.

When a CPM User requests to obtain the disposition-state of the sent CPM Standalone Message, or of the sent CPM Chat Message, the CPM Client SHALL include a disposition notification request in a CPIM header field of the sent CPM Standalone Message, or of the sent CPM Chat Message. Disposition notifications for CPM are delivery notification and read report.

When a delivery notification and/or read report for one or more CPM Messages was requested, the receiving entity (e.g. terminating CPM Client, terminating CPM Participating Function or CPM IWF) SHALL generate the respective disposition notification as described in sect. 5.4.1 "*Generate Delivery Notification*" and 5.4.2 "*Generate read Report*" in any one of the following cases:

o   Delivery notification:

-    When terminating CPM Participating Function:

- has successfully delivered a stored CPM Message(s) for the CPM User, if the terminating CPM Client does not support disposition notifications (as determined from the User-Agent header field containing the version 1.0 of the CPM Client);

- Or, when terminating CPM Client:

  - has successfully received the CPM Message for which the delivery notification was requested, if allowed by the local device's settings;

- Or, when the CPM IWF:

  - has received a successful delivery notification for interworked CPM Message(s).

o Read Report:

- When terminating CPM Client:

  - has successfully rendered the CPM Chat Message for which the disposition notification was requested, whether it was delivered within the CPM Session, or later on, as a stored CPM Message.

When a delivery notification for one or more CPM File Transfer files was requested, the receiving entity (i.e. terminating CPM Client, a CPM Participating Function or CPM IWF) SHALL generate the delivery notification as described in Section 5.4.1 "Generate Delivery Notification".

The disposition notification message is sent using either:

- SIP MESSAGE method according to the rules and procedures of [RFC5438] and [RFC5438Errata] , for CPM Standalone Messages and CPM File Transfer(s); or for CPM Sessions when the disposition notifications are sent after the CPM Session was terminated; or,

- MSRP procedure, when the disposition notifications are sent during an on-going CPM Session with the requestor, reusing the same MSRP session.

When SIP MESSAGE method is used, or when a session is set up explicitly to deliver stored notifications, the disposition notifications are sent back to the same user device that has originated the message for which the disposition notifications are being issued.

If a CPM Client did not receive a GRUU, but did receive a +sip.instance parameter in the Contact header field of an incoming SIP request, then to ensure a generated SIP request is sent back to the same device, a new Accept-Contact header is added carrying only the +sip.instance parameter and the instance identifier value, as well as the tags explicit;require.

5.4.1   Generate Delivery Notification

Upon receiving a CPM Standalone Message, or a CPM Chat Message, or CPM File Transfer file the receiving entity (e.g. terminating CPM Client, terminating CPM Participating Function or CPM IWF):

1. SHALL check whether the message contains the request for a successful delivery notification element in a CPIM header as described in [RFC5438];

2. If true and allowed by local device's settings, the receiving entity SHALL construct a successful delivery notification (IMDN) according to the rules and procedures of [RFC5438] and [RFC5438Errata] with the following additional clarifications:

    a. Using SIP MESSAGE method:

        i. If an IMDN-Record-Route header field was received in the corresponding CPM Standalone Message, or in the corresponding CPM Chat Message, the CPM Client SHALL include in the Request-URI the topmost entry from the IMDN-Route header field;

        ii. If no IMDN-Record-Route header field was received in the corresponding CPM Standalone Message, or in the corresponding CPM Chat Message, the CPM Client SHALL include in the Request-URI one of:

            1. the public GRUU if received in the Contact header field of the received SIP INVITE request, or;

            2. the authenticated originator's CPM Address of the received SIP MESSAGE request,

iii. If a device identifier was received in the Contact header field of the SIP INVITE, or in the CPIM From header field of the Pager Mode CPM Standalone Message SIP MESSAGE, the receiving entity SHALL set the device identifier value in the Accept-Contact header field as described in sect. 6.1.2. " *Identifying the recipient device in SIP requests and responses*";

iv. The CPM Client SHALL set the CPIM To header field either to the public GRUU included in the Contact header field of the received SIP INVITE request, or to the authenticated originator's CPM Address of the received SIP MESSAGE request;

v. The CPM Client SHALL include in the Conversation-ID header field the value received in the original CPM Standalone Message, or of the CPM Chat Message, and a Contribution-ID header field with a newly generated value;

vi. The CPM Client SHALL send the SIP MESSAGE request carrying a successful delivery notification according to the rules and procedures of the SIP/IP core.

Note: CPM File Transfer only supports <delivery-notification> element.

b. Using MSRP procedure during an active CPM Session:

1. It SHALL construct a MSRP SEND toward the requestor of the disposition notification with the following clarifications:

   i. the "Content-type" header field SHALL contain a MIME type "message/cpim" as specified in [RFC3862];

   ii. The "From" header field SHALL contain the SIP URI address of the CPM User on behalf of which the receiving entity is issuing the disposition notification;

   iii. The "To" header field SHALL contain the SIP URI of the notification requestor.

2. It SHALL construct the payload according to [RFC5438] Section 7.2 and [RFC5438Errata] with the following clarification:

   a. the CPIM body [RFC3862] carries a IMDN XML document formatted, as specified in [RFC5438];

   b. the Content-Type header field SHALL be set to =" message/imdn+xml "as specified in [RFC5438];

   c. the <message-id> element SHALL be set to the IMDN Message-ID value of the CPIM header of the original CPM Chat Message for which this IMDN notification is issued;

   d. the <delivery-notification> element SHALL be populated as per the disposition type that the sender requested and is being reported.

5.4.2   Generate Read Report

Upon receiving a CPM Standalone Message, or a CPM Chat Message and if privacy settings allow it, the CPM Client:

1. SHALL check whether the message contains the request for display notification element in CPIM header, as described in [RFC5438], to generate a read report;

   a. If it contains the request for display notification, the CPM Client SHALL check if the message is stored in the CPM User's network-based Message Storage.

      i. If it is stored, the CPM Client SHALL check the "\read-report-sent" status flag attribute as described in [OMA-CPM_TS_MessageStorage].

         - If it is false, proceed with step 2;

         - Otherwise, no further steps are required.

      ii. Otherwise, proceed with step 2.

   b. Otherwise, no further steps are required.

2. When the CPM Client determines that the CPM User has read the message (e.g. by user confirmation) and allowed by local device's settings, the CPM Client SHALL construct a read report according to the rules and procedures of [RFC5438] and [RFC5438Errata], with the following additional clarifications:

   - Using SIP MESSAGE method:

1) If an IMDN-Record-Route header field was received in the corresponding CPM Standalone Message, or in the CPM Chat Message, it SHALL include in the Request-URI the topmost entry from the IMDN-Route header field;

2) If no IMDN-Record-Route header field was received in the corresponding CPM Standalone Message, or in the CPM Chat Message, it SHALL include in the Request-URI one of:
   a. the public GRUU if received in the Contact header of the received SIP INVITE request, or
   b. the authenticated originator's CPM Address of received SIP MESSAGE request;

3) If a device identifier was received in the Contact header field of the SIP INVITE, or in the CPIM From header field of the Pager Mode CPM Standalone Message SIP MESSAGE, the CPM Client SHALL set the device identifier value in the Accept-Contact header field as described in sect. 6.1.2. " *Identifying the recipient device in SIP requests and responses*";

4) SHALL set the CPIM To header field to the public GRUU included in the Contact header field of the received SIP INVITE request or the authenticated originator's CPM Address of the received SIP MESSAGE request;

5) The CPM Client SHALL include in the Conversation-ID header field the value received in the original CPM Standalone Message, or of the CPM Chat Message, and a Contribution-ID header field with a newly generated value;

6) SHALL send the SIP MESSAGE request carrying a read report according to the rules and procedures of the SIP/IP core.

7) If the message is stored in the Message Storage Server, the CPM Client SHALL send a request to set "\read-report-sent" status flag attribute to true for the corresponding message in the Message Storage Server as described in section 6.6.1 "Metadata Operation" in [OMA-CPM_TS_MessageStorage] to indicate that future retrievals of this message need not to generate a read report.

NOTE: The"\read-report-sent" status flag is visible to the CPM Client but masked to the CPM User.

- Using MSRP procedure during an active CPM Session:

1) It SHALL construct a MSRP SEND toward the requestor of the disposition notification with the following clarifications:
   i. the "Content-type" header field SHALL contain a MIME type "message/cpim" as specified in [RFC3862];
   ii. The "From" header field SHALL contain the SIP URI address of the CPM User on behalf of which the receiving entity is issuing the disposition notification;
   iii. The "To" header field SHALL contain the SIP URI of the notification requestor.

2) It SHALL construct the payload according to [RFC5438] Section 7.2 with the following clarification:
   i. the CPIM body [RFC3862] carries a IMDN XML document formatted, as specified in [RFC5438];
   ii. the Content-Type header field SHALL be set to =" message/imdn+xml "as specified in [RFC5438];
   iii. the <message-id> element SHALL be set to the IMDN Message-ID value of the CPIM header of the original CPM Chat Message for which this IMDN notification is issued;
   iv. the <display-notification> element SHALL be set as per the disposition type that the sender requested and that is being reported.

5.4.3 Receive Delivery Notification

Upon receiving a delivery notification, the CPM Client SHALL process the notification as specified in [RFC5438] and [RFC5438Errata].

5.4.4 Receive Read Report

Upon receiving a read report, the CPM Client SHALL process the notification as specified in [RFC5438] and [RFC5438Errata].

5.5   "isComposing" Notifications

The "i*sComposing*" notification is generated and processed according to the rules and procedures of [RFC3994]. Consequently, the '*isComposing*' indication for CPM Chat Message(s) exchanged during 1-1 CPM Session is not sent with CPIM headers, and a delivery and/or displayed notification SHALL NOT be requested.

The '*isComposing*' indication sent for CPM Chat Messages exchanged during a CPM Group Session SHALL contain CPIM header fields as per recommendation of [RFC3994], to indicate the originator of the '*isComposing*' message in the "From" header field.

5.6   CPM Service IDs

The CPM service capabilities may be exchanged through different methods.

For CPM service capabilities publication through OMA Presence Enabler [OMA PRES], the following <service-description> child elements, registered by OMNA, SHALL be used in the presence document, according to [OMA PDE]:

For CPM Standalone capabilities:

   →<service-id>→org.openmobilealliance:StandaloneMsg

   →<version>→2.0

For CPM Session capabilities:

  o CPM Session:

   →<service-id>→org.openmobilealliance:ChatSession

   →<version>→2.0

For CPM File Transfer capabilities:

   →<service-id>→org.openmobilealliance:File-Transfer

   →<version>→2.0

   →<service-id>→org.openmobilealliance:File-Transfer-thumb

   →<version>→2.0

6. Common Procedures

6.1 Authenticated Originator's CPM Address

The authenticated originator's CPM Address is:

- the CPM Address of the originating CPM Client that has been authenticated by the SIP/IP core; or

- the CPM Pre-defined Group address when the CPM Controlling Function sends a CPM Standalone Message, CPM Session Invitation or CPM File Transfer request to CPM Pre-defined Group members; or

- the CPM Group Session Identity for this particular CPM Ad-hoc Group when the CPM Controlling Function invites users to a CPM Ad-hoc Group.

When the SIP/IP core corresponds to 3GPP/3GPP2 IMS, then the authenticated originator's CPM Address is contained in the P-Asserted-Identity header according to the rules and procedures of [3GPP TS 24.229] / [3GPP2 X.S0013.004] and as described in [RFC3325] and [RFC5876]. The CPM Client MAY insert a P-Preferred-Identity header, which contains the CPM Client's preferred identity, for the SIP/IP core to be used inside the P-Asserted-Identity header. The P-Preferred-Identity is selected by the CPM Client from the list of CPM Addresses in the P-Associated-URI header received at registration response.

If anonymity is required, the From header SHALL contain an anonymous URI according to [RFC3323] and optionally a Pseudonym or "Anonymous" as the display name, and the Privacy header field values SHALL be set according to [RFC3323] and [RFC3325].

NOTE: The term "anonymity" in this specification is referring to the term "privacy" used in [RFC3323].

If the CPM Participating Function cannot obtain an authenticated originator's CPM Address for an initial request, it SHALL reject the request with a SIP 403 "Forbidden" response. The CPM Participating Function SHOULD include a Warning header to explain the reason in a human readable textual form.

When the Referred-By header is set to the authenticated originator's CPM Address, then both the SIP URI and TEL URI values in the P-Asserted-Identity header [RFC3325] SHALL be included in the Referred-By header as described in [draft-referred-by].

6.1.1 Identifying the sending device in SIP requests and responses

If a CPM Client obtains GRUUs from the registrar, as per [RFC5627], the CPM Client SHALL use the public GRUU as the URI to be used in the Contact header field in non-REGISTER SIP requests and responses that it emits. For example, the GRUU URI SHALL be included in the Contact header field of any SIP INVITE request and related SIP 200 OK response.

Since it is not mandatory for the SIP/IP Core to support GRUU, then if a CPM Client does not obtain a GRUU from the registrar, it SHALL include the +sip.instance feature tag in the Contact header field with the same instance identifier value used at registration in any non-REGISTER SIP request and responses that it emits, and which carry a Contact header field.

For SIP MESSAGE requests, the identity of the sender is populated in the CPIM From header field and can include:

- the public GRUU for the sender, or

- the authenticated originator's CPM Address for the sender CPM User plus the sip.instance value for the sender's client, or

- the authenticated originator's CPM Address of the sender, when no device identifier is populated.

In MSRP messages (e.g., in CPM Chat Messages sent within a CPM Session), the sender sets the device identifier (either a public GRUU or a sip.instance value) in the CPIM From header field in the MSRP SEND request.

Examples:

- CPIM From header field set to a public GRUU:
  From: <sip:mysipuri@example.com;gr=abc12387cb90fgxzd436h>

- CPIM From header field set to a sip.instance value:
  From: <sip:mysipuri@example.com?Accept-Contact=+sip.instance%3D%22%3Curn:uuid:a76d4cad-9dab-17d0-f712-00b0d76c9af2%3E%22%3Brequire%3Bexplicit>
  Note: URI parameters require percent encoding of the Accept-Contact header field.

Note: the placement of the +sip.instance inside the angle brackets is only valid in the CPIM From header.

6.1.2   Identifying the recipient device in SIP requests and responses

If a CPM Client received a GRUU as the URI in the Contact header field of an incoming SIP request, then to ensure a generated SIP request is sent back to the same device, the Request-URI of the generated SIP request is set to the Authenticated Originator's CPM Address as specified in section 6.1. "*Authenticated Originator's CPM Address*", of the incoming SIP request, and the GRUU related "gr=" URI parameter from the Contact header field of the incoming SIP request is added.

If a CPM Client did not receive a GRUU but received a +sip.instance feature tag in the Contact header field of an incoming SIP request, or in the CPIM From header field (as described in section 6.1.1. " *Identifying the sender device in SIP requests and responses*") if the SIP request or response did not contain a Contact header field, then to ensure a generated SIP request is sent back to the same device, a new Accept-Contact header field is added carrying only the +sip.instance parameter and instance identifier value as well as the tags explicit;require described in RFC3841.

The CPM Client supporting the *+sip.instance* procedures SHALL respond to the invite with a 486 BUSY HERE if the identifier value of the *sip.instance* parameter included in the *Accept-Contact* header of that incoming SIP request does not match theirs.

In context of multi-client and multi-device deployments, it is possible that same CPM User identity is shared by the CPM Client and by other IMS Clients (e.g. Voice over LTE client using SMS over IP). To ensure that CPM requests are forked only to CPM Clients (i.e. which have explicitly registered with the required CPM capabilities), a dedicated Accept-Contact header field SHALL be added to all CPM SIP requests carrying the CPM ICSI defined for the respective CPM service with the *require* and *explicit* parameters described in RFC3841, by the terminating CPM Participating Function.

6.2   SIP/IP Core

The CPM Functional components SHALL interface to the underlying SIP/IP core in accordance with the rules and procedures for that SIP/IP core as described in [RFC3261].

When the SIP/IP core corresponds with 3GPP/3GPP2 IMS, these rules and procedures are described in [3GPP TS 24.229] / [3GPP2 X.S0013.004].

6.3   Display Name and Anonymity

Using a display name in a CPM Conversation serves different purposes. In case anonymity is requested, it provides the user with a Pseudonym, hiding the user's real identity. In case anonymity is not requested, it is used to display a human readable name for the user. Finally, for a CPM Conversation in a CPM Pre-defined Group, each Participant may be given a group specific display name. This group specific display name is stored in the Group XDMS, as specified in [OMA-XDM-Group].

The CPM Participating Function, CPM Controlling Function and CPM Client MAY send a display name in SIP requests and SIP responses.

The CPM Client MAY support the use of a display name. The CPM Client MAY support the user agent behaviour described in [RFC3323] and [RFC3325].

The CPM Participating Function and CPM Controlling Function SHALL support the use of a display name and the network-provided anonymity/privacy described in [RFC3323] and [RFC3325].

The following text describes the procedures when the CPM Client, the CPM Participating Function and CPM Controlling Function support the use of a display name and anonymity.

A CPM Client MAY provide the inviting CPM User's Pseudonym (this is a user defined name) in the "display-name" part of the authenticated originator's CPM Address, i.e. in the P-Preferred-Identity header or, e.g. when the P-Preferred-Identity header is not included, in the From header of the initial SIP INVITE request or SIP REFER request sent towards the CPM Participating Function.

> NOTE: A display name included in the P-Preferred-Identity header is moved to the P-Asserted-Identity header by the underlying SIP/IP core if validation of the CPM Address is successful as described in [RFC3325].

The terminating CPM Client MAY provide the invited CPM User's display name in the "display-name" part of the To header of a SIP 200 "OK" response to an initial SIP INVITE request.

An originating or terminating CPM Client MAY request anonymity by adding privacy type "id" to the Privacy header as described in [RFC3323] and [RFC3325].

The CPM Participating Function SHALL act on privacy type "id" detected in a Privacy header as described in [RFC3323] and [RFC3325] to provide the CPM User with anonymity when requested.

The CPM Controlling Function SHALL determine the display name to use, according to the following priority order:

1. In case anonymity is requested, and the CPM Pre-defined Group definition as specified in [OMA-XDM-Group] allows anonymity, the display name as provided by the CPM Client SHALL be used if the display name is allowed by service provider's policy. If no display name was defined by the CPM Client, or this display name is already in use in the session, the CPM Controlling Functions chooses a display name as defined in 9.2.13 "Pseudonyms in a CPM Group Session".

2. In case anonymity is not requested, the display name received in the "display-name" part of the authenticated originator's CPM Address of initial SIP requests and, for display name of the responding side, of SIP 200 "OK" responses to the initial SIP requests from Participants SHALL be used. If no authenticated originator's CPM Address was provided, the display name received in the "display-name" part of the From header of initial SIP requests and, for display name of responding side, in the "display-name" part of the To header of the SIP 200 "OK" responses to the initial SIP requests from Participants SHALL be used.

A CPM Client receiving a display name (either on the terminating or the originating side) SHALL display the display name to the user.

6.4   Warning Header Field

6.4.1   General

The CPM Participating Function or CPM Controlling Function MAY include a free text string in an error response to SIP requests.

When the CPM Participating Function or CPM Controlling Function includes a text string in an error response to a SIP INVITE request or a SIP MESSAGE request the text string SHALL be included in a Warning header field as specified in [RFC3261]. When including a text string in an error response, the CPM Participating Function or CPM Controlling Function SHALL include the Warning code set to 399 and MAY include the host name set to the host name of the CPM Participating Function or CPM Controlling Function.

The CPM Client MAY include the preferred language in the Accept-Language header field in the SIP INVITE request, SIP MESSAGE request or SIP 2xx response.

The CPM Participating Function or CPM Controlling Function SHOULD choose the language of the warning text in the Warning header field depending on the preferred language indicated in the Accept-Language header field received from the CPM Client in the SIP INVITE request, SIP MESSAGE request or in the SIP 2xx response. If the warning text is to be translated, only explanatory text of the free text string SHALL be replaced by the preferred language.

6.4.2   Warning Texts

The text string included in a Warning header field consists of an explanatory text preceded by a 3-digit text code, according to the format <xxx> + <explanatory text>, for example "102 Too many participants".

The warning texts and codes are defined in Table 1.

Code	Explanatory text	Description
102	Too many participants	The maximum number of Participants allowed in a CPM Session is exceeded.
105	Isfocus already assigned	A conference focus (a CPM Controlling Function) has already been assigned to the CPM Session.
119	Anonymity not allowed	Anonymity is requested, but is not allowed.
122	Function not allowed	Function is not allowed, but a detailed description about the reason is not given.
123	Session does not exist	The target session in the Request URI does not exist.
125	No messages	Messages are requested to be retrieved, but there are no messages.
127	Service not authorised	The User is not authorised for this service.
129	No destinations	No destination addresses available for the action.
132	Version not supported	The CPM version indicated in the request is not supported.
133	Size exceeded	The file size is bigger than the acceptable file size for a CPM File Transfer.

Table 1: CPM specific warning texts

6.5   Communicating with the ISF

In order to send a CPM Standalone Message, CPM File Transfer or CPM Session Invitation to the ISF, the CPM Participating Function or the CPM Controlling Function SHALL act as a UAC, as defined in [RFC3261], and send the SIP MESSAGE request (corresponding with a Pager Mode CPM Standalone Message or a CPM Standalone Message Disposition Notification) or SIP INVITE request (corresponding with a Large Message Mode CPM Standalone Message, CPM File Transfer or a CPM Session Invitation) directly to the ISF, without routing the SIP request via the SIP/IP core.

7. Procedures at CPM Client

A CPM Client provides the CPM User with an interface to access the functionalities of the CPM Enabler.

Before a CPM Client can provide CPM functionalities to the CPM User it has to register to the SIP/IP core as described in section 7.1 "*Registering at the SIP/IP Core*".

A CPM Client can initiate new communications in a number of ways, as follows:

- When a CPM Client needs to send a Pager Mode CPM Standalone Message, it SHALL follow the procedures described in section 7.2.1.1 "*Sending a Pager Mode CPM Standalone Message*".

- When a CPM Client needs to send a Large Message Mode CPM Standalone Message, it SHALL follow the procedures described in section 7.2.1.2 "*Sending a Large Message Mode CPM Standalone Message*".

- When a CPM Client needs to initiate a new CPM Session or rejoin a previous CPM Session, it SHALL follow one of the procedures described in section 7.3.1 "*Initiating New CPM Sessions*", depending on what kind of CPM Session is to be initiated.

- When a CPM Client needs to initiate a new CPM File Transfer, it SHALL follow the procedures defined in section 7.4.1 "*CPM File Transfer Session Initiation*".

- When a CPM Client needs to handle Deferred CPM Message(s), it SHALL follow the procedures defined in section 7.2.3.2 "*Handling Deferred CPM Message(s)*".

- When a CPM Client needs to handle Deferred CPM 1-1 Session Message(s) delivery, it SHALL follow the procedures defined in section 7.3.12 "Handling Deferred CPM 1-1 Session Message Delivery".

- When a CPM Client needs to handle Deferred CPM Group Session Message(s) delivery, it SHALL follow the procedures defined in section 7.3.11 "Handling Deferred CPM Group Session Message Delivery".

A CPM Client handles incoming CPM communications in the following manners:

- Upon receiving a SIP MESSAGE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.cpm.msg' or with CPM Feature Tag 'urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred' (defined in Appendix H) included in the Accept-Contact header field, the CPM Client SHALL handle this SIP MESSAGE request as described in section 7.2.2.1 "*Receiving a Pager Mode CPM Standalone Message*".

- Upon receiving a SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.cpm.largemsg' or with CPM Feature Tag 'urn:urn-7:3gpp-service.ims-icsi.oma.cpm.deferred' (defined in Appendix H) included in the Accept-Contact header field, the CPM Client SHALL handle this SIP INVITE request as described in section 7.2.2.2 "*Receiving a Large Message Mode CPM Standalone* Message".

- Upon receiving a SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' or with CPM Feature Tag 'urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred' (defined in Appendix H) included in the Accept-Contact header field, the CPM Client SHALL handle this SIP INVITE request as described in section 7.3.2 "*Receiving a CPM Session Invitation*", or section 7.3.11 "Handling Deferred CPM Group Session Message Delivery or section 7.3.12 "Handling Deferred CPM 1-1 Session Message Delivery",

- Upon receiving a SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.cpm.filetransfer' (defined in Appendix H) included in the Accept-Contact header field, the CPM Client SHALL handle this SIP INVITE request as described in section 7.4.2 "*Receiving a CPM File Transfer Request*",

The CPM Client SHALL include a User-Agent header field to indicate the OMA CPM release version of the CPM Client as specified in Appendix D "*Release Version in User-agent and Server headers*".

7.1 Registering at the SIP/IP Core

The CPM Client's CPM service registration or re-registration to the SIP/IP core SHALL be made according to the rules and procedures of [RFC3261] and the SIP/IP core.

When registering or re-registering for the CPM service, the CPM Client:

1. SHALL generate a SIP REGISTER request according to the rules and procedures of [RFC3261];

2. SHALL include the CPM Feature Tags of the supported features in the Contact header field as described in Appendix H "*CPM Feature Tags*";

3. SHALL include a +sip.instance header field parameter in each contact included in the SIP REGISTER,with the instance identifier value (called instance ID in [RFC5627]) of the CPM Client in the Contact header field according to [RFC5626];

   NOTE 1: The procedures to set the instance identifier value are out of scope of this specification.

4. SHALL indicate CPM Client user agent capabilities in the Contact header field according to [RFC3840];

5. SHALL indicate the name of the CPM Client, as provided by the CPM User, in the display-name part of the Contact header field as provided by the CPM User;

6. MAY include a Supported header field with the option tag 'gruu' according to [RFC5627];

7. MAY include a Require header field with the option tag 'gruu' according to [RFC5627];

8. SHALL send the SIP REGISTER request towards the SIP/IP core according to the rules and procedures of the SIP/IP core.

To maintain the SIP registration for the CPM service active, the CPM Client SHALL use the re-registration procedure as specified in [RFC3261].

When the CPM service is no longer required, the CPM Client SHALL send a SIP REGISTER request without CPM Feature Tags of the supported features in the Contact header field as described in Appendix H "*CPM Feature Tags*"; according to the rules and procedures of [RFC3261] terminating the existing CPM registration. If the CPM Client also needs to deregister from the SIP/IP core, it SHALL send a SIP REGISTER request with an Expires header field set to 0, as defined in [RFC3261]

If device settings are to pull Deferred CPM Messages, the CPM Client SHALL subscribe to the "deferred-messages" event package as described in section 7.2.3.1 "*Subscribe to Deferred CPM Message* Info".

7.2 CPM Standalone Message Handling

CPM Clients MAY support different text and media types (including SMIL) as defined in [3GPP TS 26.141].

7.2.1 Sending CPM Standalone Messages

7.2.1.1 Sending a Pager Mode CPM Standalone Message

When the CPM Client wants to send a CPM Standalone Message and the CPM Standalone Message is small enough (i.e. less than or equal to 1300 bytes) to be sent as a Pager Mode CPM Standalone Message, the CPM Client SHALL generate a SIP MESSAGE request according to the rules and procedures of [RFC3428]. The CPM Client:

1. SHALL include an Accept-Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.cpm.msg' percent encoded in a g.3gpp.icsi-ref media feature tag according to [3GPP TS 24.229] section 7.2A.8.2 "*Coding of the ICSI*";

2. MAY include one of the registered CPM Addresses of the CPM User as described in section 6.1 "*Authenticated Originator's CPM Address*" as authenticated originator's CPM Address;

3. SHALL set the P-Preferred-Service header field with the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.msg';

4. SHALL include a Reply-To header field if the CPM User requests a different reply address from the address included in the From header field;

5. SHALL include a User-Agent header field to indicate the OMA CPM release version of the CPM Client as specified in Appendix D "*Release Version in User-agent and Server headers*";

6. If anonymity is requested, SHALL include value "id" in a Privacy header field according to the rules and procedures of [RFC3325];

7. If the CPM User or CPM Client wants to specify an expiry time for the CPM Standalone Message, SHALL include an Expires header field as defined in [RFC3261];

8. If the CPM Standalone Message is to be sent to one CPM user or to one non-CPM Principal, the CPM Client SHALL set the Request-URI of the SIP MESSAGE request as follows:

    a. In case of a new CPM Standalone Message to the address of the target CPM User or the target non-CPM Principal;

    b. In case of a reply and a Reply-To header field is included in the received CPM Standalone Message for which the CPM Standalone Message is a reply to, to the address in that Reply-To header field, unless a new address is provided by the CPM User;

    c. In case of a reply and no Reply-To header field is included in the received CPM Standalone Message for which the CPM Standalone Message is a reply to, to the address in the header field containing the authenticated originator's CPM Address, unless a new address is provided by the CPM User.

9. If the CPM Standalone Message is to be sent to a CPM Ad-hoc Group, then the CPM Client:

    a. SHALL set the Request-URI to the address of the CPM Controlling Function provisioned to the CPM Client;

    b. SHALL include a MIME resource-list body with the target addresses of the CPM Users and non-CPM Principals as specified in [RFC5365];

    c. In case of a reply and a Reply-To header field is included in the received CPM Standalone Message for which the CPM Standalone Message is a reply to, SHALL insert to the MIME resource-list body at least the address of that Reply-To header field, unless a new address is provided by the CPM User;

    d. In case of a reply and no Reply-To header field is included in the received CPM Standalone Message for which the CPM Standalone Message is a reply to, SHALL insert to the MIME resource-list body at least the address in the header field containing the authenticated originator's CPM Address, unless a new address is provided by the CPM User.

10. If the CPM Standalone Message is to be sent to a CPM Pre-defined Group, then the CPM Client SHALL set the Request-URI to the address of the target CPM Pre-defined Group;

11. If the CPM Standalone Message starts a new CPM Conversation, the CPM Client SHALL include a Conversation-ID header field set to a newly generated value as specified in Appendix C "*CPM-defined SIP Header* fields", Otherwise, the CPM Client SHALL include the Conversation-ID of the existing CPM Conversation;

12. The CPM Client SHALL include a Contribution-ID header field with a newly generated Contribution-ID value as specified in Appendix C "*CPM-defined SIP Header* fields";

13. If the CPM Standalone Message is in reply to a previously received CPM Standalone Message, CPM File Transfer or CPM Session Invitation, the CPM Client SHALL include the InReplyTo-Contribution-ID header field with the value of Contribution-ID in the previously received CPM Standalone Message, CPM File Transfer or CPM Session Invitation;

14. The CPM Client SHALL generate a CPIM message wrapper as defined in section 7.2.1.3 "*Generate a CPM Standalone Message*";

15. The CPM Client SHALL set the body of the SIP MESSAGE request to the generated CPIM message wrapper;

16. The CPM Client SHALL send the SIP MESSAGE request according to the rules and procedures of the SIP/IP core.

7.2.1.2 Sending a Large Message Mode CPM Standalone Message

When the CPM Client wants to send a CPM Standalone Message and the CPM Standalone Message is too large (i.e. larger than 1300 bytes) to be sent as a Pager Mode CPM Standalone Message, the CPM Client SHALL generate an initial SIP INVITE request according to the rules and procedures of [RFC3261]. The CPM Client:

1. SHALL include an Accept-Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.cpm.largemsg' percent encoded in a g.3gpp.icsi-ref media feature tag according to [3GPP TS 24.229] section 7.2A.8.2 *"Coding of the ICSI"*;

2. SHALL include the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.cpm.largemsg' percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 *"Coding of the ICSI"* in a g.3gpp.icsi-ref media feature tag of the Contact header field;

3. SHALL set the P-Preferred-Service header field with the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.largemsg';

4. MAY include one of the registered CPM Addresses of the CPM User as described in section 6.1 *"Authenticated Originator's CPM Address"* as authenticated originator's CPM Address;

5. SHALL include a Reply-To header field if the CPM User requests a different reply address;

6. SHALL include a User-Agent header field to indicate the OMA CPM release version of the CPM Client as specified in Appendix D *"Release Version in User-agent and Server headers"*;

7. If anonymity is requested, SHALL include value "id" in a Privacy header field according to the rules and procedures of [RFC3325];

8. If the CPM User or CPM Client wants to specify an expiry time for the CPM Standalone Message, SHALL include a Message-Expires header field as defined in Appendix C *"CPM-defined SIP Header fields"*;

9. If the Large Message Mode CPM Standalone Message is to be sent to one CPM user or to one non-CPM Principal, the CPM Client SHALL set the Request-URI of the SIP INVITE request as follows:

    a. In the case of a new CPM Standalone Message, to the address of the target CPM User or the target non-CPM Principal;

    b. In case of a reply and a Reply-To header field is included in the received CPM Standalone Message, CPM File Transfer or CPM Session Invitation for which the CPM Standalone Message is a reply to, to the address of that Reply-To header field, unless a new address is provided by the CPM User;

    c. In case of a reply and no Reply-To header field is included in the received CPM Standalone Message, CPM File Transfer or CPM Session Invitation for which the CPM Standalone Message is a reply to, to the address of the header field containing the authenticated originator's CPM Address, unless a new address is provided by the CPM User.

10. If the Large Message Mode CPM Standalone Message is to be sent to a CPM Ad-hoc Group, then the CPM Client:

    a. SHALL set the Request-URI to the address of the CPM Controlling Function provisioned to the CPM Client;

    b. SHALL include a MIME resource-list body with the target addresses of the CPM Users and non-CPM Principals as specified in [RFC5364];

    c. In case of a reply and a Reply-To header field is included in the received CPM Standalone Message for which the CPM Standalone Message is a reply to, SHALL insert to the MIME resource-list body at least the address of that Reply-To header field, unless a new address is provided by the CPM User;

    d. In case of a reply and no Reply-To header field is included in the received CPM Standalone Message, CPM File Transfer or CPM Session Invitation for which the CPM Standalone Message is a reply to, to the address in the header field containing the authenticated originator's CPM Address of the received CPM Standalone Message, unless a new address is provided by the CPM User.

11. If the Large Message Mode CPM Standalone Message is to be sent to a CPM Pre-defined Group, then the CPM Client SHALL set the Request-URI to the address of the target CPM Pre-defined Group;

12. SHALL include the option tag 'timer' in the Supported header field;

13. SHOULD include the Session-Expires header field with the refresher parameter set to "uac" according to the rules and procedures of [RFC4028];

14. If the Large Message Mode CPM Standalone Message starts a new CPM Conversation, the CPM Client SHALL include a Conversation-ID header field set to a newly generated value as specified in Appendix C "*CPM-defined SIP Header* fields". Otherwise, the CPM Client SHALL include the Conversation-ID of the existing CPM Conversation.

15. The CPM Client SHALL include a Contribution-ID header field with a newly generated Contribution-ID value as specified in Appendix C "*CPM-defined SIP Header* fields";

16. If the Large Message Mode CPM Standalone Message is in reply to a previously received CPM Standalone Message , CPM File Transfer or CPM Session Invitation, the CPM Client SHALL include the InReplyTo-Contribution-ID header field with the value of Contribution-ID in the previously received CPM Standalone Message, CPM File Transfer or CPM Session Invitation as specified in Appendix C "*CPM-defined SIP Header* fields";

17. SHALL include in the SIP INVITE request a MIME SDP body as a SDP offer according to the rules and procedures of [RFC3264], [RFC4566], [RFC4975], [RFC6135] and [draft-ietf-simple-msrp-sessmatch] with the following clarification:

    a. SHALL set the SDP directional media attribute to a=sendonly;

    b. SHALL set the content type as a=accept-types:message/cpim;

    c. SHALL set the sub-content type as a=accept-wrapped-types:*;

    d. SHALL set MSRP URI for the MSRP connection setup as a=path:MSRP URI;

    e. SHALL set the size as a=file-selector:size:actual message size;

    f. SHALL set the a=setup attribute as "active".

    NOTE: The value '*' is for example and implementations shall set this value to the MIME sub-media types of the CPIM.

18. The CPM Client SHALL send the SIP INVITE request according to the rules and procedures of the SIP/IP core.

When the CPM Client needs to cancel the message delivery and if the CPM Client has not yet received a final SIP response for the SIP INVITE request, the CPM Client SHALL send a SIP CANCEL request according to the rules and procedures of [RFC3261].

On receiving a SIP 200 "OK" response to the sent SIP INVITE request, the CPM Client:

1. SHALL start a SIP session timer using the value received in the Session-Expires header field according to the rules and procedures of [RFC4028];

2. SHALL generate and send a SIP ACK request as an acknowledgement of the final response according to the rules and procedures of [RFC3261];

3. SHALL act as an MSRP client according to [RFC6135];

4. SHALL act as an active endpoint to open the transport connection according to [RFC6135];

5. SHALL establish the MSRP connection according to the MSRP connection parameters in the SDP answer received in the SIP 200 "OK" response according to [RFC4975];

6. SHALL send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of [RFC4975] and [RFC6135];

7. SHALL generate a CPIM message wrapper as defined in section 7.2.1.3 "*Generate a CPM Standalone Message*".

8. SHALL generate one or more MSRP SEND requests (depending on whether chunking is used) according to the rules and procedures of [RFC4975] and the following additional clarifications. The CPM Client:

    a. SHALL set To-Path header field according to the MSRP URI(s) received in the answer SDP;

    b. SHALL set the content type as Content-Type = message/cpim as described in [RFC3862];

      c.   SHALL set the body of the MSRP SEND request(s) to the generated CPIM message wrapper.

   9.   SHALL send the MSRP SEND requests(s) on the established MSRP connection

Once the CPM Standalone Message has been successfully transferred via MSRP, the CPM Client:

   1.   SHALL generate a SIP BYE request according to the rules and procedures of [RFC3261];

   2.   SHALL send a SIP BYE request according to the rules and procedures of SIP/IP core.

7.2.1.3 Generate a CPM Standalone Message

In order to generate a CPM Standalone Message, a CPM Client SHALL generate a CPIM message as defined in [RFC3862], with the following clarifications:

   1.   SHALL set the From header field of the CPIM message to the address of the sending CPM User, as described in section 6.1.1. "*Identifying the sending device in SIP requests and responses*";

   2.   SHALL set the To header field of the CPIM message as follows:

      a.   If the CPM Standalone Message is to be sent to one CPM User or to one non-CPM Principal, the CPM Client SHALL set the To header field of the CPIM message to the address of the recipient;

      b.   If the CPM Standalone Message is to be sent to a CPM Ad-hoc Group, the CPM Client SHALL set the To header field of the CPIM message to the address of the CPM Controlling Function provisioned to the CPM Client;

      c.   If the CPM Standalone Message is to be sent to a CPM Pre-defined Group, the CPM Client SHALL set the To header field of the CPIM message to the address of the target CPM Pre-defined Group;

   3.   If the CPM user wishes to obtain the disposition-state of the CPM Standalone Message (e.g. whether the message is delivered to the recipients or not, whether the recipients read the message), the CPM Client SHALL set the disposition notification according to the rules and procedures described in section 5.4 "***Error! Reference source not found.****s*".

7.2.1.4 Forwarding/Including Stored Data without Downloading to the CPM Client

When a CPM Client generates a SIP MESSAGE or MSRP SEND request with references to stored data (e.g. Media Objects, CPM Standalone Messages, CPM Session Histories or CPM Conversation History) in the Message Storage Server, the CPM Client:

   1.   SHALL obtain the URL to the stored data from the Message Storage Client;

     NOTE: The Message Storage Client obtains the URL from the Message Storage Server.

   2.   SHALL include a Content-Type header field as specified in [RFC4483] (i.e. type set to "message/external-body", access-type set to "URL", and the URL obtained in step 1 in the URL parameter). When including a URL, the URL SHALL be modified to include the extension "?action=fetch";

     NOTE: If there are other Content-Type header fields within the SIP MESSAGE request, the CPM Client shall include the Content-Type header field "multipart/mixed" with the proper boundary value to distinguish the URL part and existing parts as described in [RFC2046].

   3.   If the size of the message is over 1300 bytes, the CPM Client SHALL perform the procedures specified in 7.2.1.2 "*Sending a Large* Message". Otherwise, the CPM Client SHALL perform the procedures specified in 7.2.1.1 "*Sending a Pager Mode CPM Standalone Message*".

7.2.2 Receiving CPM Standalone Messages

7.2.2.1 Receiving a Pager Mode CPM Standalone Message

Upon receiving a SIP MESSAGE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.cpm.msg' included in the Accept-Contact header field corresponding to Pager Mode CPM Standalone

Message or with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred' included in the Accept-Contact header field corresponding to a Deferred CPM Message, the CPM Client:

1. MAY reject the SIP MESSAGE request if it determines that there are not enough resources to handle the SIP MESSAGE request and return a SIP 480 "Temporarily Unavailable" response.

Otherwise, the CPM Client:

1. SHALL generate a SIP 200 "OK" response according to rules and procedures of [RFC3428];

2. SHALL include a Server header field to indicate the OMA CPM release version of the CPM Client as specified in Appendix D "*Release Version in User-agent and Server headers*".

3. MAY include one of the registered CPM Addresses of the CPM User as described in section 6.1 "*Authenticated Originator's CPM Address*" as authenticated recipient 's CPM Address;

4. SHALL include all of the Conversation-ID, Contribution-ID and InReplyTo-Contribution-ID header fields received in the SIP MESSAGE request;

5. SHALL send the SIP response according to rules and procedures of the SIP/IP core;

6. SHALL handle the received Pager Mode CPM Standalone Message as described in section 7.2.2.3 "*Handling of Received CPM Standalone Messages*".

7.2.2.2   Receiving a Large Message Mode CPM Standalone Message

Upon receiving a SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.cpm.largemsg' included in the Accept-Contact header field corresponding to Large Message Mode CPM Standalone Message, or upon receiving a SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred' included in the Accept-Contact header field corresponding to Deferred Large Message Mode CPM Standalone Message, the CPM Client MAY reject the SIP INVITE request if it determines that there are not enough resources to handle the SIP INVITE request and return a SIP 480 "Temporarily Unavailable" response;

Otherwise, the CPM Client:

1. SHALL check if the accept-type attribute of the SDP m line in the SIP INVITE request are acceptable to the CPM Client and if not, reject the request with a SIP 488 "Media Type Not Acceptable Here" response.

    Otherwise, continue with the rest of the steps;

2. SHALL generate a SIP 200 "OK" response to the received initial SIP INVITE request according to the rules and procedures of [RFC3261] with the following clarifications:

    a. The CPM Client SHALL include a Server header field to indicate the OMA CPM release version of the CPM Client as specified in Appendix D "*Release Version in User-agent and Server headers*"

    b. The CPM Client MAY include one of the registered CPM Addresses of the CPM User as described in section 6.1 "*Authenticated Originator's CPM Address*" as authenticated recipient 's CPM Address;

    c. The CPM Client SHALL include an answer SDP according to the rules and procedures of [RFC3264], [RFC4566], [RFC4975], [RFC6135] and [draft-ietf-simple-msrp-sessmatch] with the following clarifications:

        i. The CPM Client SHALL include media line proposing MSRP media parameters;

        ii. The CPM Client SHALL include its own MSRP URI for the MSRP connection setup as a=path:MSRP URI;

        iii. The CPM Client SHALL set the SDP directional media attribute to a=recvonly;

        iv. The CPM Client SHALL set the content type as a=accept-types:message/cpim;

        v. The CPM Client SHALL set the sub-content type as a=accept-wrapped-types:*;

        vi. The CPM Client SHALL set the a=setup attribute as "active".

NOTE: The value '*' for ' accept-wrapped-types ' attribute is for example and implementations may copy the value from the SDP offer or don't have to include this attribute in the SDP answer.

    d. The CPM Client SHALL include any of the Conversation-ID, Contribution-ID and InReplyTo-Contribution-ID header fields received in the SIP INVITE request.

3. SHALL send the SIP 200 "OK" response according to the rules and procedures of the SIP/IP core.

Upon receivinga SIP CANCEL request, the CPM Client SHALL act as UAS to handle the request according to the rules and procedures of [RFC3261].

Upon receivinga SIP ACK request, the CPM Client:

1. SHALL handle the SIP ACK request according to the rules and procedures of [RFC3261];

2. SHALL act as an MSRP client according to [RFC6135];

3. SHALL act as an active endpoint to open the transport connection according to [RFC6135];

4. SHALL establish the MSRP connection according to the MSRP connection parameters in the SDP offer received in the SIP INVITE request according to [RFC4975];

5. SHALL send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of [RFC4975] and [RFC6135].

When the CPM Client receives an MSRP request, the Client SHALL follow the rules and procedures defined in [RFC4975] and in [draft-ietf-simple-msrp-sessmatch]. If an MSRP SEND request indicates the use of chunking, the CPM Client SHALL wait until all further MSRP SEND requests for the remaining chunks have been received and SHALL reassemble the entire set of MSRP requests into the CPM Standalone Message.

Upon receiving a SIP BYE request, the CPM Client SHALL respond to the SIP BYE request as described in [RFC3261].

The CPM Client SHALL handle the received CPM Standalone Message as described in section 7.2.2.3 "*Handling of Received CPM Standalone Messages*".

7.2.2.3   Handling of Received CPM Standalone Messages

When a CPM Client has received a CPM Standalone Message, the CPM Client:

1. SHALL check the Content-Disposition header field of the CPIM message. If there is a value in the header field, the terminating CPM Client SHALL follow the value;

2. If the body includes references to content external to the message having the Content-Type: message/external-body; the CPM Client SHALL treat them according to rules and procedures in [RFC4483];

3. SHALL check whether the message contains the request for delivery notification. If true, the CPM Client SHALL send a disposition notification as described in section 5.4.1 "***Error! Reference source not found.***";

4. SHALL check whether the message contains the request for read report. If true, the CPM Client SHALL handle the request for read report as described in section 5.4.2 "***Error! Reference source not found.***";

5. If a Message-UID header field as defined in Appendix C "*CPM-defined SIP Header* fields" is included, SHALL store the UID value in conjunction with the message if storing the received CPM Standalone Message in the local storage.

7.2.3   Deferred CPM Message Handling

7.2.3.1   Subscribe to Deferred CPM Message Info

If device settings are set to pull Deferred CPM Standalone Messages, the CPM Client SHALL subscribe to the "deferred-messages" event package in order to receive information about Deferred CPM Standalone Messages. The CPM Client:

1. SHALL generate a SIP SUBSCRIBE request, according to the rules and procedures of [RFC3265] with the following clarifications:

a. SHALL set the Request-URI to the following address: CPMDeferredMsgMgmt@hostname as provisioned to the CPM Client;

b. SHALL include an Accept-Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred' percent encoded in a g.3gpp.icsi-ref media feature tag according to [3GPP TS 24.229] section 7.2A.8.2 *"Coding of the ICSI"*;

c. SHALL include a Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred' percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 *"Coding of the ICSI"* in a g.3gpp.icsi-ref media feature tag of the Contact header field;

d. MAY include one of the registered CPM Addresses of the CPM User as described in section 6.1"*Authenticated Originator's CPM Address*" as the authenticated originator's CPM Address;

e. SHALL set the P-Preferred-Service header field with the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred';

f. SHALL set the Event header field to "deferred-messages";

g. SHALL set the Expires header field to "0";

h. SHALL send the SUBSCRIBE request according to the rules and procedures of the SIP/IP core.

Upon receiving a SIP NOTIFY request with the information on the Deferred CPM Standalone Messages, the CPM Client SHALL display the list of Deferred CPM Standalone Messages to the CPM User and SHALL allow the CPM User to process the list as described in section 7.2.3.2.1 "*Handling Deferred CPM Message(s) before Having Received an Expiry Notification* " to execute the decisions of the CPM User.

7.2.3.2 Handling Deferred CPM Message(s)

7.2.3.2.1 Handling Deferred CPM Message(s) before Having Received an Expiry Notification

Handling of Deferred CPM Chat Messages is out of scope of the specification and it is left to implementations.

Handling of Deferred CPM Standalone Message(s) is performed by setting up a session with the CPM Participating Function. The message-URI-ID(s) of the Deferred CPM Standalone Message(s) to be retrieved, deleted, interworked or stored are listed in a URI list as defined in [RFC5366]. The absence of a URI-list in the session set up indicates that all messages are to be retrieved.

NOTE 1: The CPM Client may initiate this procedure at the instruction of the CPM User.

When handling Deferred CPM Standalone Message(s) before receiving a notification about expiry, the CPM Client:

1. SHALL generate an initial SIP INVITE request according to the rules and procedures of [RFC3261];

2. SHALL set the Request-URI of the SIP INVITE request to CPMDeferredMsgMgmtURI for the CPM service in the home CPM network of the CPM User;

3. SHALL include the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred' percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 *"Coding of the ICSI"* in a g.3gpp.icsi-ref media feature tag of the Contact header field;

4. SHALL include the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred' percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 *"Coding of the ICSI"* in a g.3gpp.icsi-ref media feature tag of the Accept-Contact header field;

5. SHALL set the P-Preferred-Service header field with the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred';

6. SHALL include in the SIP INVITE request a MIME SDP body as an SDP offer according to the rules and procedures of [RFC3264], [RFC4566] and [RFC4975] with the following additional clarifications. The CPM Client:

    a. SHALL set the SDP "accept-types" attribute to a=accept-types:message/cpim;

b. MAY list other formats or use '*' as defined in [RFC4975];

c. SHALL set the media direction attribute to a=recvonly.

7. If not all the Deferred CPM Standalone Messages are to be retrieved, the CPM Client

a. SHALL include a MIME resource-list body as specified in [RFC5366]. Each entry in the URI-list identifies a Deferred CPM Standalone Message and SHALL contain one of the following parameters:

i. "?cpm_action=deliver", if the Deferred CPM Standalone Message identified by the URI is to be retrieved;

ii. "?cpm_action=delete", if the Deferred CPM Standalone Message identified by the URI is to be deleted;

iii. "?cpm_action=interwork", if the Deferred CPM Standalone Message identified by the URI is to be interworked;

iv. "?cpm_action=store", if the Deferred CPM Standalone Message identified by the URI is to be delivered to the Message Storage Server.

NOTE 2: Any deferred message not mentioned in the MIME resource-list in the SIP INVITE request will stay deferred.

8. SHALL send the SIP INVITE request to the CPM Participating Function according to the rules and procedures of [RFC3261] and the SIP/IP core.

NOTE 3: The media plane of the above session is not needed and therefore is not being set up.

On receiving a SIP 488 "Not Acceptable Here" response with a Warning header field with the warning text set to "125 No messages" the CPM Client SHALL not pursue handling of the Deferred CPM Standalone Messages specified in above SIP INVITE request and SHALL process the SIP 488 "Not Acceptable Here" response according to the rules and procedures of [RFC3261].

Any other error response SHALL be processed according to the rules and procedures of [RFC3261].

On receiving a SIP 200 "OK" response to the SIP INVITE request, the CPM Client SHALL generate and send a SIP ACK request according to [RFC3261]. After having sent the SIP ACK request, the CPM Client SHALL send a SIP BYE request.

If there are any Deferred CPM Standalone Messages to be delivered, these will be sent by the CPM Participating Function and the CPM Client SHALL handle the received CPM Standalone Message as described in section 7.2.2 "*Receiving CPM Standalone Messages*".

7.2.3.2.2 Retrieving CPM Standalone Message(s) after Receiving a Notification for Expiry of Deferred CPM Message(s)

When retrieving CPM Standalone Message(s) after receiving a notification that Deferred CPM Standalone Message(s) were expired as in section 7.2.3.3 "*Receiving a notification for Expiry of Deferred CPM* Standalone Message*"*, the CPM Client SHALL perform the following procedures:

1. If the Deferred CPM Standalone Messages were discarded after expiry, the CPM Client SHALL inform the CPM User that the Deferred CPM Standalone Messages were already discarded because they were expired;

2. If the Deferred CPM Standalone Messages were stored in Message Storage Server after expiry, the CPM Client SHALL perform the following procedures:

a. MAY send a request to fetch the stored messages as described in section 6.3.2 "*Object Fetch Operation*" of [OMA-CPM_TS_MessageStorage]. The request SHALL use the UID which was obtained in section 7.2.3.3 "*Receiving a notification for Expiry of Deferred CPM* Standalone Message*"*; or, alternatively

b. MAY inform the CPM User that the Deferred CPM Standalone Messages were already stored in Message Storage Server because they were expired.

7.2.3.3 Receiving a notification for Expiry of Deferred CPM Standalone Message

When receiving a notification that includes information on the handling of deferred messages that expired (i.e. whether those messages discarded or stored), the CPM Client:

1. MAY inform theCPM User that the messages expired and were processed according to the user preferences;

2. SHALL store the UID(s) included in the notification, if any.

NOTE: The CPM Client can later fetch the corresponding messages from the Message Storage Server.

7.2.3.4 Notification Handling

7.2.3.4.1 Out-of-band Notifications

NOTE: The out-of-band notifications reach the CPM Client via the Push Client of the device.

Upon receiving an out-of-band notification from the CPM Participating Function to signal that there is a new unseen Deferred CPM Standalone Message available for the CPM Client, the CPM Client:

1. MAY display the received notification to the CPM User to verify whether the CPM User wants to connect to the CPM service;

NOTE: The CPM Client may also, e.g. based on device settings, take a decision on behalf of the CPM User, without interacting with the CPM User.

2. SHALL decide, possibly based on the CPM User's input, whether to connect to the CPM service. If yes, then the CPM Client SHALL register to the CPM service as described in section 7.1 "*Registering at the SIP/IP* Core*"*.

7.2.3.4.2 In-band Notifications

Upon receiving a SIP MESSAGE request containing the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.cpm.systemmsg' included in the Accept-Contact header field for in-band notification to signal that there are Deferred CPM Standalone Messages available for the CPM Client, the CPM Client MAY, depending on device settings, display the received notification to the CPM User to allow him to process the notification as described in section 7.2.3.2.1 "*Handling Deferred CPM Message(s) before Having Received an Expiry Notification* ".

7.3 CPM Session Handling

7.3.1 Initiating New CPM Sessions

7.3.1.1 Initiating a CPM 1-1 Session

The CPM Client SHALL generate an initial SIP INVITE request according to the rules and procedures of [RFC3261]. In this SIP INVITE request, the CPM Client:

1. SHALL include the address of a target CPM User or a non-CPM Principal in the Request-URI;

2. SHALL include an Accept-Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' , percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 *"Coding of the ICSI"* in a g.3gpp.icsi-ref media feature tag;;

3. SHALL set the P-Preferred-Service header field with the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session';

4. SHALL include a Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' , percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 *"Coding of the ICSI"* in a g.3gpp.icsi-ref media feature tag;

5. SHALL include the CPM Address of the CPM User as the authenticated originator's CPM Address;

6. SHALL include a User-Agent header field to indicate the OMA CPM release version of the CPM Client as specified in Appendix D "*Release Version in User-agent and Server headers*";

7. MAY include a temporary GRUU of the sending CPM Client in the Contact header field if anonymity is requested, and otherwise SHALL include either the public GRUU or the +sip.instance parameter in the Contact header field, whose value is set to an instance identifier that uniquely identifies the CPM User's device;.

8. If anonymity is requested, SHALL include value "id" in a Privacy header field according to the rules and procedures of [RFC3325];

9. MAY include a Supported header field with the option tag 'timer' and option tag 'gruu';

10. SHOULD include a Session-Expires header field with the refresher parameter set to "uac" according to the rules and procedures of [RFC4028];

11. If the CPM Session starts a new CPM Conversation, the CPM Client SHALL include a Conversation-ID header field set to a newly generated value as specified in Appendix C "*CPM-defined SIP Header* fields"; Otherwise include the Conversation-ID of the existing CPM Conversation;

12. The CPM Client SHALL include a Contribution-ID header field with a newly generated Contribution-ID value as specified in Appendix C "*CPM-defined SIP Header* fields";

13. If the CPM Session is in reply to a previously received CPM Standalone Message, CPM File Transfer or CPM Session Invitation, the CPM Client SHALL include the InReplyTo-Contribution-ID header field with the value of Contribution-ID in the previously received CPM Standalone Message, CPM File Transfer or CPM Session Invitation;

14. SHALL include a MIME SDP body as an SDP offer as described in section 5.2.1.1 "*SDP Contents when Initiating or Modifying a CPM Session*";

15. SHALL send the SIP INVITE request according to the rules and procedures of the SIP/IP core.

On receipt of the SIP 200 "OK" response to the initial SIP INVITE request the CPM Client SHALL handle the response according to the rules and procedures of [RFC3261], with the following clarifications:

1. The CPM Client SHALL start a SIP session timer using the value received in the Session-Expires header field according to the rules and procedures of [RFC4028].

2. The CPM Client SHALL generate and send a SIP ACK request as an acknowledgement of the final response according to the rules and procedures of [RFC3261].

3. The CPM Client SHALL initiate the Media Plane as described in section 7.3.9 "*Media Plane Handling for CPM Sessions*".

7.3.1.2   Initiating a CPM Group Session for a CPM Ad-hoc Group

The CPM Client SHALL generate an initial SIP INVITE request according to the rules and procedures of [RFC3261]. In this SIP INVITE request the CPM Client:

1. SHALL set the Request-URI of the SIP INVITE request to the CPM Controlling Function URI provisioned in the device;

2. SHALL include an Accept-Contact header field with the CPM feature-tag 'urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session', percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 "*Coding of the ICSI*" in a g.3gpp.icsi-ref media feature tag;

3. SHALL include a Contact header field with the CPM feature-tag 'urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session', percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 "*Coding of the ICSI*" in a g.3gpp.icsi-ref media feature tag;

4. SHALL set the P-Preferred-Service header field with the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session';

5. SHALL include a MIME resource-list body with the invited CPM Users as specified in [RFC5366];

6. SHALL check that the number of Invited CPM Users on the URI-list does not exceed the maximum number of Participants allowed in a CPM Group Session for a CPM Ad-hoc Group, as provisioned to the device. If exceeded, the CPM Client SHALL notify the CPM User.

   Otherwise, continue with the rest of the steps;

7. If anonymity is requested by the CPM User, SHALL include value "id" in the Privacy header field according to the rules and procedures of [RFC3325];

8. If the CPM Session starts a new CPM Conversation, the CPM Client SHALL include a Conversation-ID header field set to a newly generated value as specified in Appendix C "*CPM-defined SIP Header* fields"; Otherwise include the Conversation-ID of the existing CPM Conversation;

9. The CPM Client SHALL include a Contribution-ID header field with a newly generated Contribution-ID value as specified in Appendix C "*CPM-defined SIP Header* fields";

10. If the CPM Session is in reply to a previously received CPM Standalone Message, CPM File Transfer or CPM Session Invitation, the CPM Client SHALL include the InReplyTo-Contribution-ID header field with the value of Contribution-ID in the previously received CPM Standalone Message, CPM File Transfer or CPM Session Invitation;

11. SHALL include a MIME SDP body as a SDP offer as described in section 5.2.1.1 "*SDP Contents when Initiating or Modifying a CPM Session*";

12. If the CPM User requested the CPM Group Session to be a Closed CPM Group Session, then the CPM Client SHALL populate the SDP attribute *a=chatroom* defined in **Error! Reference source not found.** with the CPM reserved chat-token value of '*org.openmobilealliance.groupchat.closed*' to indicate the CPM Closed Group Session in the SIP INVITE. The SDP attribute value SHALL be: "*a=chatroom:org.openmobilealliance.groupchat.closed*";

13. SHALL send the SIP INVITE request according to the rules and procedures of the SIP/IP core.

On receiving a SIP 200 "OK" response to the SIP INVITE request, the CPM Client SHALL handle the response according to the rules and procedures of [RFC3261], with the following clarifications:

1. The CPM Client SHALL generate and send a SIP ACK request as an acknowledgement of the final response according to the rules and procedures of [RFC3261];

2. The CPM Client SHALL store the contents of the Contact header field as the CPM Group Session Identity, as described in [RFC4579];

3. The CPM Client SHALL initiate the Media Plane as in section 7.3.9 "*Media Plane Handling for CPM Sessions*".

The CPM Client SHALL subscribe to the conference state event package of the CPM Group Session Identity as specified in section 7.3.10 "*Participant Information*" and SHALL maintain the subscription throughout the CPM Client's participation in the CPM Group Session.

7.3.1.3   Initiating a CPM Group Session for a CPM Pre-defined Group

The CPM Client SHALL generate an initial SIP INVITE request according to the rules and procedures of [RFC3261]. In this SIP INVITE request the CPM Client:

1. SHALL set the Request-URI of the SIP INVITE request to the CPM Pre-Defined Group address;

2. SHALL include an Accept-Contact header field with the CPM feature-tag 'urn:urn-7:3gpp-service.ims.'urn:urn-7:3gpp-service.ims.icsi.cpm.session', percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 "*Coding of the ICSI*" in a g.3gpp.icsi-ref media feature tag;

3. SHALL set the P-Preferred-Service header field with the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session';

4. SHALL include a Contact header field with the CPM feature-tag 'urn:urn-7:3gpp-service.ims.'urn:urn-7:3gpp-service.ims.icsi.cpm.session', percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 "*Coding of the ICSI*" in a g.3gpp.icsi-ref media feature tag;

5. If anonymity is requested by the CPM User, the CPM Client SHALL include value "id" in the Privacy header field according to the rules and procedures of [RFC3325];

6. If the CPM Session starts a new CPM Conversation, the CPM Client SHALL include a Conversation-ID header field set to a newly generated value as specified in Appendix C "*CPM-defined SIP Header* fields"; Otherwise include the Conversation-ID of the existing CPM Conversation;

7. The CPM Client SHALL include a Contribution-ID header field with a newly generated Contribution-ID value as specified in Appendix C "*CPM-defined SIP Header* fields";

8. If the CPM Session is in reply to a previously received CPM Standalone Message, CPM File Transfer or CPM Session Invitation, the CPM Client SHALL include the InReplyTo-Contribution-ID header field with the value of Contribution-ID in the previously received CPM Standalone Message , CPM File Transfer or CPM Session Invitation;

9. SHALL include in the SIP INVITE request a MIME SDP body as a SDP offer as described in section 5.2.1.1 "*SDP Contents when Initiating or Modifying a CPM Session*";

10. SHALL send the SIP INVITE request according to the rules and procedures of the SIP/IP core.

On receiving a SIP 200 "OK" response to the SIP INVITE request, the CPM Client SHALL handle the response according to the rules and procedures of [RFC3261], with the following clarifications:

1. The CPM Client SHALL generate and send a SIP ACK request as an acknowledgement of the final response towards the CPM Controlling Function; and,

2. The CPM Client SHALL store the contents of the Contact header field as the CPM Group Session Identity, as described in [RFC4579]; and,

3. The CPM Client SHALL initiate the Media Plane as in section 7.3.9 "*Media Plane Handling for CPM Sessions*".

The CPM Client SHALL subscribe to the conference state event package of the CPM Group Session Identity as specified in section 7.3.10 "*Participant Information*" and SHALL maintain the subscription throughout the CPM Client's participation in the CPM Group Session.

7.3.1.4 Joining a CPM Group Session for a Join-in Group

The CPM Client SHALL generate a SIP INVITE request according to the rules and procedures of [RFC3261] . In this SIP INVITE request the CPM Client:

1. SHALL set the Request-URI to the address of the target CPM Pre-defined Group;

2. SHALL include an Accept-Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 "*Coding of the ICSI*" in a g.3gpp.icsi-ref media feature tag;

3. SHALL include a Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 "*Coding of the ICSI*" in a g.3gpp.icsi-ref media feature tag;

4. SHALL set the P-Preferred-Service header field with the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session';

5. SHALL include the CPM Address of the CPM User as the authenticated originator's CPM Address;

6. SHALL include a User-Agent header field to indicate the OMA CPM release version of the CPM Client as specified in Appendix D "*Release Version in User-agent and Server headers*"

7. If anonymity is requested, SHALL include value "id" in a Privacy header field according to the rules and procedures of [RFC3325].

NOTE: If anonymity is not allowed for the CPM Group indicated with the Request-URI of the SIP INVITE based on the rules specified in the [OMA-XDM-Group] the CPM Session Invitation will not be allowed by the CPM Controlling Function hosting the CPM Group.

8. SHALL include a Conversation-ID header field set to a newly generated value as specified in Appendix C "*CPM-defined SIP Header* fields";

9. SHALL include a Contribution-ID header field with a newly generated Contribution-ID value as specified in Appendix C "*CPM-defined SIP Header* fields";

10. SHALL include a MIME SDP body as a SDP offer as described in section 5.2.1.1 "*SDP Contents when Initiating or Modifying a CPM Session*".

11. SHALL send the SIP INVITE request according to the rules and procedures of the SIP/IP core.

On receiving a SIP 200 "OK" response to the SIP INVITE request the CPM Client SHALL handle the response according to the rules and procedures of [RFC3261], with the following clarifications:

1. The CPM Client SHALL generate and send a SIP ACK request as an acknowledgement of the final response towards the CPM Controlling Function;

2. The CPM Client SHALL store the contents of the Contact header field as the CPM Group Session Identity, as described in [RFC4579];

3. The CPM Client SHALL store the CPM Conversation Identity and CPM Contribution Identity, if received, and use them for CPM Conversation identification instead of the newly generated CPM Conversation Identity and CPM Contribution Identity included in the SIP INVITE request;

4. The CPM Client SHALL initiate the Media Plane as in section 7.3.9 "*Media Plane Handling for CPM Sessions*".

The CPM Client SHALL subscribe to the conference state event package of the CPM Group Session Identity as specified in section 7.3.10 "*Participant Information*" and SHALL maintain the subscription throughout the CPM Client's participation in the CPM Group Session.

7.3.1.5 Re-joining a CPM Long-lived Group Session

The CPM Client SHALL generate a SIP INVITE request according to the rules and procedures of [RFC3261] . In this SIP INVITE request the CPM Client:

1) SHALL set the Request-URI to the address of the target CPM Group Session of CPM Long-live Group Session;

2) SHALL include an Accept-Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 "*Coding of the ICSI*" in a g.3gpp.icsi-ref media feature tag;

3) SHALL include a Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 "*Coding of the ICSI*" in a g.3gpp.icsi-ref media feature tag;;

4) SHALL set the P-Preferred-Service header field with the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session';

5) SHALL include the CPM Address of the CPM User as the authenticated originator's CPM Address;

6) SHALL include a User-Agent header field to indicate the OMA CPM release version of the CPM Client as specified in Appendix D "*Release Version in User-agent and Server headers*"

7) If anonymity is requested, SHALL include value "id" in a Privacy header field according to the rules and procedures of [RFC3325].

   NOTE: If anonymity is not allowed for the CPM Group indicated with the Request-URI of the SIP INVITE based on the rules specified in the [OMA-XDM-Group] the CPM Session Invitation will not be allowed by the CPM Controlling Function hosting the CPM Group.

8) SHALL include the Conversation-ID header field of the requested CPM Group Session;

9) SHALL include the Contribution-ID header field of the requested CPM Group Session;

10) SHALL include the MIME SDP body of the requested CPM Group Session as a SDP offer as described in section 5.2.1.1 "*SDP Contents when Initiating or Modifying a CPM Session*".

11) SHALL send the SIP INVITE request according to the rules and procedures of the SIP/IP core.

On receiving a SIP 200 "OK" response to the SIP INVITE request the CPM Client SHALL handle the response according to the rules and procedures of [RFC3261], with the following clarifications:

1) The CPM Client SHALL generate and send a SIP ACK request as an acknowledgement of the final response towards the CPM Controlling Function;

2) The CPM Client SHALL store the contents of the Contact header field as the CPM Group Session Identity, as described in [RFC4579];

3) The CPM Client SHALL store the CPM Contribution-ID, if a different value was received from the CPM Controlling Function than the Contribution-ID included in the original SIP INVITE (e.g. if another Participant could have re-started the CPM Long-lived Group Session at the same time with a different Contribution-ID), and use it for CPM Group Session;

4) The CPM Client SHALL initiate the Media Plane as in section 7.3.9 "*Media Plane Handling for CPM Sessions*".

On receiving SIP 404 "Not Found" or SIP 403"Forbidden"error response to the SIP INVITE request, the CPM Client MAY generate and send a new SIP INVITE request as specified in section 7.3.1.2 "Initiating a CPM Group Session for a CPM Ad-hoc Group", with the following clarifications:

1) SHALL include a MIME resource-list body with the last Participant Information as specified in [RFC5366];

2) SHALL include the Conversation-ID header field of the requested CPM Group Session;

3) SHALL include the Contribution-ID header of the requested CPM Group Session

In the case of CPM Client receives a SIP INVITE of the same CPM Group Session during it own SIP INVITE of re-joint CPM Group Session, CPM Client SHALL use the received SIP INVITE request as specified in section 7.3.2 "Receiving a CPM Session Invitation", instead of it own initiated SIP INVITE request.

If the CPM Group Session was successfully established with the CPM Client, the CPM Client SHALL subscribe to the conference state event package of the CPM Group Session Identity as specified in section 7.3.10 "*Participant Information*" and SHALL maintain the subscription throughout the CPM Client's participation in the CPM Long-lived Group Session.

7.3.2   Receiving a CPM Session Invitation

Upon receiving an initial SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' included in the Accept-Contact header field, the CPM Client:

1. SHALL return:

    a. a SIP 480 "Temporarily Unavailable" response if there are not enough resources to handle the CPM Session, , or if the CPM User or CPM Client temporarily declines the CPM Group Session invitation (e.g. CPM User is roaming and does not want to take the CPM Group Session at that time) or

    b. a SIP 486 "Busy Here" response if the CPM User or CPM Client decides not to take the additional session (e.g. if audio session is requested when audio is already part of another session) or

    c. a SIP 302 "Moved Temporarily" response if redirecting the CPM Session Invitation is requested by a local device's setting or CPM User, or

    d. a SIP 603 "Declined" response if the CPM User has rejected the invitation.

    Otherwise, continue with the rest of steps;

2. If a Session-Replaces header (as defined in Appendix C "*CPM-defined SIP Header* fields") is included in the SIP INVITE request, it SHALL determine whether a corresponding CPM 1-1 Session exists. If there is no ongoing CPM

1-1 Session whose Contribution-ID is identical to the value indicated in the Session-Replaces header, the CPM Client SHALL return a SIP 481 "Call/Transaction Does Not Exist" response.

Otherwise, continue with rest of steps:

3. MAY render the CPM Session Invitation to the CPM User based on a local device setting s, with the following clarifications:

    a. The CPM Client MAY render the subject header field as part of the CPM Session Invitation, if present;

    b. If a Session-Replaces header field is received, the CPM Client MAY render an indication that the CPM Group Session is a replacement for a CPM 1-1 Session;

    c. The CPM Client MAY display to the invited CPM User the CPM Address of the inviting CPM User, if privacy rules allow it. The CPM Client SHALL NOT display the CPM address of the inviting CPM User if Privacy header field includes value 'id'.

4. If the CPM Session Invitation is for a CPM Group Session, SHALL subscribe to the conference state event package as specified in section 7.3.10 "*Participant Information*".

    Otherwise, continue with the rest of the steps;

5. Otherwise, SHALL accept the SIP INVITE request and then the CPM Client :

    a. SHALL store the contents of the Contact header field as the CPM Group Session Identity, as described in [RFC4579];

    b. If a Session-Replaces header field is received, it SHALL replace the existing 1-1 CPM Session with the new CPM Group Session;

6. SHALL generate a SIP 200 "OK" response to the SIP INVITE request according to the rules and procedures of [RFC3261], with the following clarifications:

    a. The CPM Client SHALL include an answer SDP as described in section 5.2.1.3 "*SDP Handling at Terminating Nodes*" ;

    b. The CPM Client MAY include a display name as specified in sub clause 6.3 "*Display Name*";

    c. The CPM Client SHALL include the Conversation-ID, Contribution-ID and InReplyTo-Contribution-ID header fields and values as received in the SIP INVITE request;

7. SHALL send the SIP 200 "OK" response according to the rules and procedures of the SIP/IP core;

Upon receiving a SIP ACK request, the CPM Client:

1. SHALL handle the SIP ACK request according to the rules and procedures of [RFC3261]; and

2. SHALL initiate the Media Plane as in section 7.3.9 "*Media Plane Handling for CPM Sessions*".

3. If a Session-Replaces header field is included in the SIP INVITE request, the CPM Client SHALL send a SIP BYE request to end the CPM 1-1 Session identified in the Session-Replaces header field.

7.3.3   Extending a CPM 1-1 Session to a CPM Group Session

When a Participant in a CPM 1-1 Session wants to add one or more users to the session, the CPM Client SHALL generate an initial SIP INVITE request according to the rules and procedures of [RFC3261]. In this SIP INVITE request the CPM Client:

1. SHALL set the Request-URI of the SIP INVITE request to the URI of the Controlling Function provisioned in the CPM Client;

2. SHALL include an Accept-Contact header field with the CPM feature-tag 'urn:urn-7:3gpp-service.ims.'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session', percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 "*Coding of the ICSI*" in a g.3gpp.icsi-ref media feature tag;

3. SHALL include the CPM feature-tag 'urn:urn-7:3gpp-service.ims.'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' in the Contact header field percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 "*Coding of the ICSI*" in a g.3gpp.icsi-ref media feature tag,;

4. SHALL set the P-Preferred-Service header field with the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session';

5. MAY include a temporary GRUU of the sending CPM Client in the Contact header field if anonymity is requested, and otherwise MAY include either the public GRUU or the +sip.instance parameter in the Contact header field, whose value is set to an instance identifier that uniquely identifies the device instance;

6. SHALL include the CPM release version in the User-Agent header field as specified in Appendix D "*Release Version in User-agent and Server headers*";

7. If anonymity is requested, SHALL include value "id" in a Privacy header field according to the rules and procedures of [RFC3325];

8. SHALL add the invited user(s) in a MIME resource-list body according to [RFC5366], including also the GRUU of the original invited user that was included in the Contact header field received from that CPM User in the CPM 1-1 Session establishment;

    a. SHALL for the originally invited user identity in the MIME resource list, include the Session-Replaces header field as defined in Appendix C "*CPM-defined SIP Header* fields" with the Contribution-ID corresponding to the original session.

9. SHALL check that the number of Invited CPM Users on the URI-list does not exceed the maximum number of Participants allowed in a CPM Group Session for a CPM Ad-hoc Group as provisioned for the CPM Client. If exceeded, the CPM Client SHALL notify the CPM User.

    Otherwise, continue with the rest of the steps;

10. SHALL insert in the SIP INVITE request a Content-Type header field with multipart/mixed as specified in [RFC2046];

11. SHALL include the Conversation-ID of the ongoing CPM Session and the InReplyTo-Contribution-ID header field used in the initial SIP INVITE request for the CPM 1-1 session and a newly generated Contribution-ID value;

12. SHALL include in the SIP INVITE request a MIME SDP body as a SDP offer as described in section 5.2.1.1 "*SDP Contents when Initiating or Modifying a CPM Session*". The Media Streams in the SDP offer SHALL be identical to those in the CPM 1-1 Session;

13. SHALL send the SIP INVITE request according to the rules and procedures of SIP/IP core.

On receiving a SIP 200 "OK" response to the SIP INVITE request, the CPM Client SHALL handle the response according to the rules and procedures of [RFC3261], with the following clarifications:

1. The CPM Client SHALL generate and send a SIP ACK request as an acknowledgement of the final response towards the CPM Controlling Function;

2. The CPM Client SHALL store the contents of the Contact header field as the CPM Group Session Identity, as described in [RFC4579];

3. The CPM Client SHALL start the SIP Session timer using the value received in the Session-Expires header field according to the rules and procedures of [RFC4028];

4. The CPM Client SHALL subscribe to the conference state event package as specified in section 7.3.10 "*Participant Information*" and SHALL maintain the subscription throughout the CPM Client's participation in the CPM Group Session;

5. The CPM Client SHALL reconnect the Media Plane to the CPM Controlling Function via the CPM Participating Function, instead of connecting directly to the peer CPM Client.

7.3.4 Closing a CPM Session

7.3.4.1 Closing a CPM 1-1 Session

To close a CPM 1-1 Session, the CPM Client:

1. SHALL generate a SIP BYE request according to the rules and procedures of [RFC3261], with the Reason Header field as defined in [RFC3326] has a protocol-value set to SIP and a protocol cause=200;

2. SHALL send the SIP BYE request according to the rules and procedures of the SIP/IP core;

3. SHALL release all Media Plane resources corresponding to the CPM Session being closed.

7.3.4.2 Leaving a CPM Group Session

When a Participant wants to leave a CPM Group Session the CPM Client:

1. SHALL generate a SIP BYE request according to the rules and procedures of [RFC3261], with the Reason Header field as defined in [RFC3326] has a protocol-value set to SIP and a protocol cause=200;

2. SHALL set the Request-URI to the CPM Group Session Identity of the CPM Group Session to leave;

3. If anonymity is requested, SHALL include value "id" in the Privacy header field according to the rules and procedures of [RFC3325];

4. SHALL send the SIP BYE request according to the rules and procedures of SIP/IP core;

5. MAY store the CPM Group Session Identity, Conversation-ID, Contribution-ID and InreplyTo-Contribution-ID for a short period of time to be able to re-join the session. This time period is implementation dependent;

6. SHALL release all Media Plane resources corresponding to the CPM Group Session being closed.

7.3.4.3 Receiving a CPM Session Closing Request

Upon receiving a SIP BYE request, the CPM Client:

1. SHALL generate a SIP 200 "OK" response according to the rules and procedures of [RFC3261];

2. SHALL send the SIP 200 "OK" response according to the rules and procedures of the SIP/IP core;

3. SHALL release all Media Plane resources corresponding to the CPM Session being closed;

4. If the received SIP BYE request includes a Reason Header field with the protocol set to SIP and the protocol-cause set to 200 along with an optional protocol-text (e.g. *SIP;cause=200;text="*Call completed elsewhere") as described in [RFC3326], the CPM Client SHALL act according to device settings.

7.3.4.4 Receiving a CPM Session Cancellation

Upon receiving a SIP CANCEL request, the CPM Client SHALL follow the actions according to the rules and procedures of [RFC3261];

If the received SIP CANCEL request includes a Reason Header field with protocol set to SIP and protocol cause set to 200 and a reason text set to e.g. 'Call completed elsewhere' as described in [RFC3326], the CPM Client SHALL act according to device settings.

7.3.5 Invite other Principals to existing CPM Group Session

To add one or more Principals to an ongoing CPM Group Session, the CPM Client SHALL generate a SIP REFER request according to the rules and procedures of [RFC3515]. In this SIP REFER request, the CPM Client:

1. SHALL set the Request-URI of the SIP REFER request to the CPM Group Session Identity of an ongoing CPM Session;

2. SHALL ensure this SIP REFER request is sent within the scope of the dialog created with the SIP INVITE request for the ongoing CPM Group Session as per [RFC3515];

3. SHALL include an Accept-Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session', field percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 *"Coding of the ICSI"* in a g.3gpp.icsi-ref media feature tag;

4.   SHALL set the P-Preferred-Service header field with the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session';

5.   SHALL include a Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' field percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 *"Coding of the ICSI"* in a g.3gpp.icsi-ref media feature tag;];

6.   SHALL include a User-Agent header field to indicate the CPM release version as specified in Appendix D *"Release Version in User-agent and Server headers"*;

7.   If anonymity is requested, SHALL include value "id" in a Privacy header field according to the rules and procedures of [RFC3325];

   NOTE: If anonymity is not allowed for the CPM Group indicated with the Request-URI of the SIP REFER request based on rules specified in the [OMA-XDM-Group] the CPM Session will not be allowed by the CPM Controlling Function hosting the CPM Group.

8.   If only one Principal is invited SHALL set the Refer-To header field of the SIP REFER request to the address of the Principal to be added according to the rules and procedures of [RFC3515];

9.   If more, then one Principal is invited:

   a.   SHALL include a Refer-To header field with a pointer to an URI-list in a body part containing the MIME resource-list body according to the rules and procedures of [RFC5368];

   b.   SHALL include a MIME resource-lists body with the list addresses of the Principalsto be added according to the rules and procedures of [RFC5368];

   c.   SHALL include the "multiple-refer" option tag in the Require header field of the SIP REFER request according to the rules and procedures of [RFC4488] and [RFC5368].

10. SHALL set the "method" parameter of the Refer-To header field to "INVITE" according to the rules and procedures of [RFC3515];

11. SHALL set the Refer-Sub header field to "false" according to the rules and procedures of [RFC4488] and [RFC5368];

12. SHALL include the "norefersub" option tag in the Require header field of the SIP REFER request according to the rules and procedures of [RFC4488];

13. If the CPM Client knows the number of Participants in the CPM Group Session via a subscription to Participant Information, it SHALL check that the number added Principals plus the number ofthe Principals already participating to the CPM Group Session does not exceed the maximum number of Participants allowed in an CPM Group Session for a CPM Ad-hoc Group, as provisioned to the device. If exceeded, the CPM Client SHALL notify the CPM User.

   Otherwise, continue with the rest of the steps;

14. SHALL include the Conversation-ID, Contribution-ID and InReplyTo-Contribution-ID header fields set to the values of the ongoing CPM Session;

15. SHALL send the SIP REFER request according to the rules and procedures of the SIP/IP core.

The response to the SIP REFER request SHALL be handled according to the rules and procedures of [RFC3515] and the rules and procedures of the SIP/IP core.

If the CPM Client is aware that the CPM Group Session is a Closed CPM Group Session, then it SHALL not allow the addition of any new participants to the Closed CPM Group Session by the CPM User.

7.3.6   Remove Participants from a CPM Group Session

To remove one or more Participants from an ongoing CPM Group Session, the CPM Client SHALL generate a SIP REFER request according to the rules and procedures of [RFC3515]. In this SIP REFER request, the CPM Client:

1.   SHALL set the Request-URI of the SIP REFER request to the CPM Group Session Identity of an ongoing CPM Session;

2. SHALL ensure this SIP REFER request is sent within the scope of the dialog created with the SIP INVITE request for the on-going CPM Group Session as per [RFC3515];

3. SHALL include an Accept-Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session', percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 "Coding of the ICSI" in a g.3gpp.icsi-ref media feature tag;;

4. SHALL set the P-Preferred-Service header field with the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session';

5. SHALL include a Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session', percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 "Coding of the ICSI" in a g.3gpp.icsi-ref media feature tag;

6. SHALL include a User-Agent header field to indicate the CPM release version as specified in Appendix D "*Release Version in User-agent and Server headers*";

7. If anonymity is requested, SHALL include value "id" in a Privacy header field according to the rules and procedures of [RFC3325];

8. If only one Participant is removed:

   a. If the Participant to be removed is not an anonymous one, set the Refer-To header field of the SIP REFER request to the CPM Address of the removed Participant according to the rules and procedures of [RFC3515].;

   b. Otherwise, if the Participant to be removed is anonymous, set the Refer-To header field of the SIP REFER request to the Anonymous CPM Address of the removed Participant.

9. If more than one Participant is removed:

   a. SHALL include a Refer-To header field with a pointer to an URI-list in a body part containing the MIME resource-list body according to the rules and procedures of [RFC5368];

   b. SHALL include a MIME resource-lists body with the list of the CPM Users to be removed according to the rules and procedures of [RFC5368] if a Participant to be removed is anonymous then the anonymous CPM Address SHALL be used in the MIME resource-lists;

   c. SHALL include the "multiple-refer" option tag to the Require header field according to the rules and procedures of [RFC4488] and [RFC5368].

10. SHALL set the "method" parameter of the Refer-To header field to "BYE" according to the rules and procedures of [RFC3515];

11. SHALL set the Refer-Sub header field to "false" according to the rules and procedures of [RFC4488];

12. SHALL include the "norefersub" option-tag in the Require header field of the REFER according to the rules and procedures of [RFC4488];

13. SHALL include the Conversation-ID, Contribution-ID and InReplyTo-Contribution-ID header fields set to the values of the ongoing CPM Session;

14. SHALL send the SIP REFER request according to the rules and procedures of the SIP/IP core.

The response to the SIP REFER request SHALL be handled according to the rules and procedures of [RFC3515] and the rules and procedures of the SIP/IP core.

7.3.7   Modifying a CPM Session

The CPM Client SHALL generate a SIP re-INVITE request according to section 7.3.1 "*Initiating New CPM Sessions*" with the following additional clarifications:

1. The CPM Client SHALL set the Request-URI to the address in Contact header field of SIP INVITE request or SIP 200 "OK" response received during the session establishment;

2. The CPM Client SHALL set each of To header field, From header field and Call-ID header field to the same value as used at the session establishment;

3. The CPM Client SHALL include a modified MIME SDP body as a SDP offer as described in section 5.2.1.1 "*SDP Contents when Initiating or Modifying a CPM Session*";

4. The CPM Client SHALL send the SIP INVITE request according to the rules and procedures of the SIP/IP core.

On receipt of the SIP 200 "OK" response to the SIP re-INVITE request the CPM Client SHALL handle the response according to the rules and procedures of [RFC3261], with the following clarifications:

1. The CPM Client SHALL generate and send a SIP ACK request according to the rules and procedures of [RFC3261] and the SIP/IP core;

2. The CPM Client SHALL modify the Media Plane according to the re-negotiated SDP.

7.3.8 Handling a Received CPM Session Modification Request

Upon receiving a SIP re-INVITE request with a MIME SDP body including a new SDP offer, the CPM Client:

1. SHALL check whether the session to be modified by the received SIP re-INVITE exists. If the session does not exist the CPM Client SHALL reject the request with a SIP 481 "Call/Transaction Does Not Exist" response and SHALL include a Warning header field with the warning text set to "123 Session does not exist" in the response according to the rules and procedures of [RFC3261].

    Otherwise, continue with the rest of the steps;

2. SHALL validate the media parameters and content types listed in the "accept-types" SDP attribute. If none of the media parameters are acceptable, the CPM Client SHALL reject the request with a SIP 488 "Not Acceptable Here" response and exit this procedure.

    Otherwise, the CPM Client SHALL select a subset of the acceptable received media parameters and content types, to replace the original SDP parameters, and continue with the rest of steps;

3. SHALL generate a SIP 200 "OK" response according to the rules and procedures of [RFC3261];

4. SHALL include a Session-Expires header field in the SIP 200 "OK" response to the SIP re-INVITE request with the refresher parameter set to 'uas' and SHALL re-start the SIP Session timer according to the rules and procedures specified in [RFC4028];

5. SHALL include the option tag 'timer' in the Supported header field;

6. SHALL include a MIME SDP body as the SDP answer as described in section 5.2.1.3 "*SDP Handling at Terminating Nodes*";

7. SHALL include the Conversation-ID, Contribution-ID and InReplyTo-Contribution-ID header fields and values received in the SIP INVITE request;

8. SHALL send the SIP 200 "OK" response according to the rules and procedures of the SIP/IP core.

Upon receiving a SIP ACK request, the CPM Client:

1. SHALL handle the SIP ACK request according to the rules and procedures of [RFC3261];

2. SHALL change media parameters as specified in [RFC4975] for MSRP based media streams and, respectively, [RFC3550] for RTP/RTCP-based Media Streams.

7.3.9 Media Plane Handling for CPM Sessions

CPM Clients MAY support different text and media types (including SMIL) as defined in [3GPP TS 26.141].

When inviting, being invited or joining a CPM Session, a CPM Client SHALL negotiate the media parameters with the invited CPM Client or the CPM Participating and Controlling Function by using SDP within SIP communication.

7.3.9.1 MSRP-based Media Streams

For MSRP-based Media Streams, the Client SHALL follow the rules and procedures defined in [RFC4975] and in [draft-ietf-simple-msrp-sessmatch] for the establishment of sessions and the exchange of CPM Chat Messages, with the following clarification:

1. When sending a CPM Chat Message, the CPM Client SHALL set the "To" header field of the CPIM message as follows.

    a. If the CPM Chat Message is to be sent to one CPM user or to one non-CPM Principal, the CPM Client SHALL set the "To" header field of the CPIM message to the address of the recipient;

    b. If the CPM Chat Message is to be sent to a CPM Ad-hoc Group, the CPM Client SHALL set the "To" header field of the CPIM message to the address of the CPM Controlling Function of the on-going CPM Group Session;

    c. If the CPM Chat Message is to be sent to a CPM Pre-defined Group, the CPM Client SHALL set the "To" header field of the CPIM message to the address of the target CPM Pre-defined Group.

    d. The CPM Client SHALL request delivery reports and MAY request read reports for all CPM Chat Messages using IMDN as described in sect. 5.4. "*Disposition Notifications*".

7.3.9.2 RTP/RTCP-based Media Streams

For RTP/RTCP-based Media Streams, the CPM Client SHALL follow the rules and procedures defined in [RFC3550] for the establishment of sessions and the exchange of Media.

The CPM Client SHALL establish a RTP session according to the rules and procedures of [RFC3550]. If multiple media are used, then each of them is transmitted as a separate RTP session. That is, separate RTP and RTCP packets are transmitted for each medium using two different UDP port pairs and/or multicast addresses.

When the SIP/IP core corresponds with 3GPP/3GPP2 IMS, the procedures described in [3GPP TS 24.229] / [3GPP2 X.S0013.004] and described in [GSMA IR.92] apply for handling RTP/RTCP sessions.

7.3.10 Participant Information

7.3.10.1 Subscribe to Receiving CPM Group Session Participant Information

When a CPM Client needs to subscribe to CPM Group Session Participant Information, the CPM Client:

1. SHALL generate a SIP SUBSCRIBE request, according to the rules and procedures of [RFC3265] and [RFC4575];

2. SHALL set the Request-URI of the SIP SUBSCRIBE request to the CPM Group Session Identity;

3. SHALL include an Accept-Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 *"Coding of the ICSI"* in a g.3gpp.icsi-ref media feature tag;

4. SHALL set the P-Preferred-Service header field with the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session';

5. SHALL include a Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 *"Coding of the ICSI"* in a g.3gpp.icsi-ref media feature tag;

6. SHALL send the SIP SUBSCRIBE request according to the rules and procedures of the SIP/IP core.

The response to the SIP SUBSCRIBE request SHALL be handled according to the rules and procedures of [RFC3265] and [RFC4575], and rules and procedures of the SIP/IP core.

When needed the CPM Client SHALL terminate the subscription according to the rules and procedures of [RFC3265].

7.3.10.2   Receive Participant Information Notification

Upon receiving an incoming SIP NOTIFY request that is part of the same SIP dialog as a previously sent SIP SUBSCRIBE request for subscribing to participation information, the CPM Client:

1. SHALL handle the request according to the rules and procedures of [RFC3265] and [RFC4575], supporting the <status> element values and <disconnection-method> element values described in sect. 9.2.14.2. "*Sending Participant Information Notifications* ";

2. MAY display the Participants of the CPM Group Session by that are included in the chat Blacklist URI-list stored in [OMA-XDM-List].

7.3.11   Handling Deferred CPM Group Session Message Delivery

CPM Client SHALL support deferred message delivery of CPM Group Session.   The deferred message delivery of the CPM Group Session occurs in the following cases:

1) Receiving SIP INVITE from CPM Participating Function while CPM Group Session is inactive

   a. Upon receiving an initial SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred' included in the Accept-Contact header field, the CPM Client SHALL handle this SIP INVITE request as described in section 7.3.2 "Receiving a CPM Session Invitation", with the following clarifications:

      i. If the SIP INVITE SDP directional media attribute is set to "a=sendonly", CPM Client SHALL use the CPM Group Session established between Participating Function and CPM Client to receive deferred delivery CPM Messages (chat messages).

      ii. If the CPM Client was requested to send back delivery notification for any one of the deferred delivery chat messages, the CPM Client SHALL send the disposition notifications back over SIP MESSAGE as described in section 5.4 "Disposition Notifications".

      iii. The CPM Client SHALL use the value received in the SDP directional media attribute and CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred' as an indication of the CPM Group Session state (i.e. inactive in this case).

      iv. CPM Client SHALL respond with a 200 OK. Following the receipt of SIP ACK, the CPM Client SHALL proceed with establishing the MSRP session. Otherwise, CPM Client:

         1. SHALL return a 480 "Temporarily not available", if CPM User wishes not to receive deferred CPM Message.

      v. CPM Client SHALL NOT subscribe to the CPM Session conference state event package as described in step 4 of section 7.3.2 "Receiving a CPM Session Invitation".

      vi. It SHALL update the Participant Information data, if the Group State Object was received in the MSRP SEND messages. The Group State Object is identified by its Content Type "application/group-state-object+xml" as defined in in sect. 5.2.8 "*Group State Object*" of [OMA-CPM_TS_MessageStorage].

      vii. If CPM User replies with a new message, then CPM Client SHALL initiate a new CPM Session after completion of the deferred delivery CPM Session, as described in section 7.3.1.5 "Re-joining a CPM Long-live Group Session"

2) Receiving SIP INVITE from CPM Participating Function while CPM Group Session is active.

   a. Upon receiving an initial SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' included in the Accept-Contact header field, the CPM Client SHALL handle this SIP INVITE request as described in section 7.3.2 "Receiving a CPM Session Invitation" with the following clarifications::

      i. If the SIP INVITE SDP directional media attribute is set to "a= sendrecv", the CPM Client SHALL use this CPM Group Session;

1. to receive deferred delivery message,

2. to send back delivery notification, and

3. to send any new group chat messages.

The CPM Client SHALL use the value received in the SDP directional media attribute as an indication of the CPM Group Session state (i.e. active in this case);

ii. If Conversation-ID and Contribution-ID are included in the SIP INVITE request, CPM Client SHALL determine whether corresponding CPM Group Session is known to the CPM Client. If the CPM Client has no knowledge of a CPM Group Session with a Conversation-ID and a Contribution-ID identical to the received values in the SIP INVITE, the CPM Client SHALL return a SIP 481 "Call/Transaction Does Not Exist" response;

b. The CPM Client SHALL subscribe to the conference state event package of the CPM Group Session Identity as specified in section 7.3.10 "*Participant Information*" and SHALL maintain the subscription throughout the CPM Client's participation in the CPM Group Session.

3) CPM Client wishes to re-join CPM Group Session, after coming back online and registering in IMS, the CPM Client MAY send a SIP INVITE to re-join or re-start the CPM Group Session, following procedures described in section 3.7.1.5 "CPM Client re-join request to CPM Group Session".

The CPM Participating Function will attempt inviting the CPM Client either to deliver any deferred CPM Chat Messages for the CPM Group Session, or to re-connect the CPM Client into the CPM Group Session if it is still active. The CPM Client SHOULD NOT attempt re-joining the previously CPM Group Session, unless CPM User has CPM Message to send.

7.3.12 Handling Deferred CPM 1-1 Session Message Delivery

If any CPM Chat Message(s) is pending deferred delivery to the CPM Client, the SIP INVITE request is received from the CPM Participating Function as described in section 8.3.2.9.1.1 "*1-1 CPM Session delivery*".

When the CPM Client receives an initial SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' included in the Accept-Contact header field, the CPM Client SHALL follow the procedures described in section 7.3.2 "Receiving a CPM Session Invitation" with the following clarifications:

1) If the SIP INVITE SDP directional media attribute is set to "a=sendrecv", CPM Client SHALL use the CPM Session established between Participating Function and CPM Client to receive deferred delivery CPM Messages (chat messages) and to send any IMDN notifications back, the CPM Client's local settings allow sending disposition notification.

2) If the CPM Client was requested to send back disposition notifications for any one of the deferred delivery chat messages and

   a. the deferred delivery session was setup as unidirectional (i.e. "a=sendonly") , or

   b. the CPM User actions triggered sending of IMDN notifications (e.g. read reports) after the deferred delivery session ended,

the CPM Client's local settings allow sending disposition notification, the CPM Client SHALL send each disposition notifications using a SIP MESSAGE as described in section 5.4 "Disposition Notifications".

3) CPM Client SHALL use Conversation-ID to determine whether corresponding CPM 1-1 Session is known to the CPM Client. CPM Client SHALL respond with a 200 OK to accept the delivery. Following the receipt of SIP ACK, the CPM Client SHALL proceed with establishing the MSRP session. The CPM Client SHALL use error code 480 "Temporarily not available" to indicate that the CPM User does not wish to receive deferred CPM Message from the sender at this time.

NOTE: If CPM User replies with a new message to any of the newly delivered deferred messages, then CPM Client SHALL initiate a new CPM 1-1 Session as described in section 7.3.1.1 "Initiating a CPM 1-1 Session".

7.4 CPM File Transfer

7.4.1 CPM File Transfer Session Initiation

When a CPM Client needs to send or receive one or more files, the CPM Client:

1. SHALL follow the procedures defined in 7.3.1.1 "*Initiating a CPM 1-1 Session*" if the CPM File Transfer is to one recipient or in 7.3.1.2 "*Initiating a CPM Group Session for a CPM Ad-hoc Group*" if the CPM File Transfer is to a list of recipients, or in 7.3.1.3 "*Initiating a CPM Group Session for a CPM Pre-defined Group*" if the CPM File Transfer is to a pre-defined group and SHALL follow the rules and procedures of [RFC5547] with the following clarifications:

   a. SHALL include an Accept-Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.filetransfer' percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 "*Coding of the ICSI*" in a g.3gpp.icsi-ref media feature tag, instead of the 3gpp-service.ims.icsi.oma.cpm.session' used in the above referenced CPM procedures;

   b. SHALL include a Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.filetransfer' percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 "*Coding of the ICSI*" in a g.3gpp.icsi-ref media feature tag instead of the 3gpp-service.ims.icsi.oma.cpm.session' used in the above referenced CPM procedures;

   c. SHALL set the P-Preferred-Service header field with the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session';

   d. SHALL add the relevant media attributes to the SDP as specified in [RFC5547], with the following additional considerations:

      i. If the request is to send (push) a file, the "name", "size" and "type" sub-attributes of the "file-selector" attribute SHALL be included;

      ii. If the request is to receive (pull) a file, as many of the "file-selector" sub-attributes as are known SHALL be included;

   e. In the case of a CPM File Transfer to a single recipient and more than one file is to be sent, each set of file descriptors SHALL be sent in separate m-lines as described in [RFC5547];

   f. If the request is to send one or more files, the CPM Client SHALL validate that the size of a file being sent does not exceed the provisioned Max File Transfer Size value before continuing with the above procedures.

   g. If the recipient's capability indicates thumbnail support and the sending CPM Client supports it as well, , the sending CPM Client SHALL include a thumbnail in the SDP of the SIP INVITE request by using the file-icon attribute as defined in [RFC5547].

   h. When requesting a disposition notification, the CPM Client SHALL set the disposition notification according to the rules and procedures as described in section 5.4 "Disposition Notification".

   NOTE: the method to determine the thumbnail capability by the CPM Clients is out of scope of this specification

   NOTE: If there is more than one recipient, to transfer multiple files is not supported.

2. When the MSRP 200 "OK" response for the last MSRP SEND is received, or when an MSRP REPORT is received when a success report was requested:

   a. The CPM Client MAY check if there are other files to be transferred to the same destination;

   b. If there are additional files to be transferred and the CPM Client wants to reuse m-lines for transferring them as described in [RFC5547], the CPM Client SHALL send re-INVITE with the following clarifications:

      i. The CPM Client SHALL reuse the needed m lines by creating new relevant attributes for the new files according to procedures of [RFC5547];

      ii. if more m lines were used and are no longer needed, the CPM Client SHALL set the port in the m-line to zero (i.e. m=0) to close the MSRP session for the particular files that has been transferred according to procedures of [RFC5547];

    c. Otherwise, the CPM Client SHALL follow the procedures defined in 7.4.3 "*CPM File Transfer Session Release*";

3. If an MSRP error response or an MSRP REPORT with a failure report is received, the CPM Client SHALL indicate to the CPM User that the CPM File Transfer has failed.

7.4.1.1 CPM File Transfer Session Initiation in CPM Session

When a CPM Client needs to send files to the CPM Participant in an active CPM Session, the CPM Client SHALL follow the procedures in 7.4.1 "CPM File Transfer Session Initiation" with the following clarifications:

1. If within a CPM Session, the CPM Client SHALL use the Conversation-ID and Contribution-ID of the associated CPM session

2. If within an active CPM Group Session, the CPM Client:

    a. SHALL set the Requested-URI address to the CPM Group Session Identity of the associated CPM Group Session;

    b. SHALL not include the recipient-list;

    c. If the delivery notification is requested from each CPM Participant for the CPM File Transfer, then the CPM Client SHALL include the IMDN CPIM wrapper, and it SHALL indicate support also for IMDN content-type by adding the value "*message/imdn+xml*" in the SDP a=accept-wrapped-types attribute.

3. If the CPM Group Session is inactive, the CPM Client SHALL restart the CPM Group Session as described in 7.3.1.5 " Re-joining CPM Long-lived Group Session". Then the CPM Client will initiate the CPM File Transfer in an active CPM Group Session as described in Step 2 above.

7.4.2 Receiving a CPM File Transfer Request

Upon receiving a SIP INVITE request containing a CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.filetransfer' included in the Accept-Contact header field, the CPM Client:

1. SHOULD render to the CPM User the file description parameters received as well as the identity of the original sender of the request if available;

2. SHALL accept from the CPM User input regarding the file(s):

    a. which he is willing to accept in case of a push request, or,

    b. which he is willing to send, in the case of a pull request;

3. SHALL inspect the SDP attributes relating to the file(s) to be transferred, and if the request is for receiving one or more files, the CPM Client shall validate whether the "file-selector:size" attribute exceeds the provisioned value for this CPM Client.

4. If the CPM User accepts at least one file, SHALL return a SIP 200 "OK" response with an SDP answer containing the file identities of the files as described in [RFC5547], and otherwise SHALL return a 603 "Decline" response.

5. SHALL execute the Media Plane procedures as described in section 7.3.9.1 "*MSRP-based Media Streams*" to receive the files.

6. After completing the MSRP procedures for each transferred file, the CPM Client SHALL check whether the CPM File Transfer Request contains the request for delivery notification. If true, the CPM Client SHALL send the appropriate delivery notification as described in Section 5.4.1 "Generate Delivery Notification".

7.4.3 CPM File Transfer Session Release

When a CPM File Transfer session is complete, the sending CPM Client SHALL send a SIP BYE to close the session as described in section 7.3.4.1 "*Closing a CPM 1-1 Session*".

If the file sender or the file receiver wishes to abort the file transfer during the CPM File Transfer, the CPM Client SHALL follow the procedures in [RFC5547].

7.4.4 Fetching a Deferred CPM File Transfer file(s)

When the CPM Client failed to respond to the SIP INVITE within the session expiry timer, the CPM Participating Function cancels the SIP INVITE request towards the receiver by sending a SIP CANCEL, as described in Section 8.3.3.3 "Handling Deferred CPM File Transfer File(s)"..

Upon receiving SIP CANCEL from CPM Participating Function, corresponding to the existing CPM File Transfer request, with reason header field, Reason: SIP;cause=408 ;text="User not responding", the terminating CPM Client SHALL keep metadata of CPM File Transfer request, such as the device identifier of the File Transfer originator, the file-transfer-id and the file-name SDP attributes.

When fetching a deferred CPM File Transfer file(s), the terminating CPM Client SHALL use the previously stored file-transfer-id and file-name SDP attributes to construct a new CPM File Transfer request as defined in 7.4.5.1 "Requesting Side" to initiate a new File Transfer.

Upon receiving a 200 OK response, the terminating CPM Client SHALL set up the Media Plane according to [RFC5547].

7.4.5 Resuming an interrupted CPM File Transfer

During the CPM File Transfer session, the CPM Clients SHALL track how much of the data has been sent or received (as applicable). If the File Transfer session is interrupted, the affected CPM Client MAY request to resume the interrupted file transfer from the point of interruption, without having to transfer the entire file again.

7.4.5.1 Requesting Side

The CPM Client which requests to resume a CPM Filer Transfer (the requestor) SHALL follow the procedures defined in 7.4.1 "CPM File Transfer Session Initiation" to initiate a new File Transfer, with the following clarification:

1. If the device identifier of the File Transfer originator was included in the initial SIP INVITE received, the requestor CPM Client SHALL include the same device identifier in the new SIP INVITE.

2. SHALL include in the SDP appropriate attributes and values according to [RFC5547] to indicate the file(s) for which the CPM File Transfer session activity is to resume.

3. The SIP INVITE SDP MUST contain the following direction attribute:

   a. "a=recvonly" if the resume requestor is the original receiver;

   b. "a=sendonly" if the resume requestor is the original sender.

4. Upon receiving a 200 OK response, the requestor CPM Client SHALL set up the Media Plane, with the appropriate Byte Range header field values in MSRP request, according to [RFC5547].

7.4.5.2 Responding Side

When receiving a new SIP INVITE for a CPM File Transfer request, the CPM Client respond to a resume request (the responder), SHALL proceed as follows:

1. If the respond CPM Client is the original sender, and still has the requested file(s), it SHALL send back a 200 OK response with the SDP containing the requested file name(s).

2. If the respond CPM Client is the original recipient, it SHALL follow the procedure defined in 7.4.2 "Receiving a CPM File Transfer Request", with the appropriate Byte-Range header field values in the MSRP request.

If the respond CPM Client does not support resumption, the CPM Client SHALL return a 603 "Decline" response.

7.5 CPM Notifications

7.5.1 Multidevice handling

In multi-device scenarios, the CPM Notifications are sent to the CPM Client on the user's device that has requested it.

When a CPM Standalone Message or a CPM Chat Message, containing a disposition notification request is targeted at multiple recipients (i.e. pre-defined/ad-hoc group) or multiple different types of disposition notifications are requested for the same CPM Standalone Message or the same CPM Chat Message, the originating user MAY receive aggregated disposition notifications.If the originator CPM User's device that has initiated the CPM Message is not available at the time of delivery of disposition notification, the CPM Participating Function SHALL defer the disposition notification. In such case, the CPM Participating Function SHALL follow the same procedures as for CPM Standalone Message deferral, described in sect. 8.3.1.6 "*Defer CPM Standalone Messages*".

The device identification is performed as described in section 6.1.3. "Identifying the sending device in SIP requests and reponses" and in section 6.1.2 "Identifying the recipient device in SIP requests and reponses".

8. Procedures at CPM Participating Function

8.1 Registration

In order for the CPM Participating Function to obtain registration information of a CPM Client the CPM Participating Function receives from and/or subscribes to the SIP/IP core as described in this subclause.

The SIP/IP core sends to the CPM Participating Function all SIP REGISTER requests where at least one of the contacts in the SIP REGISTER request includes one of the CPM Feature Identifiers defined in Appendix H.3 "*Proposed Formats for CPM Feature Identifiers*".

8.1.1 Receive SIP REGISTER Notification

The CPM Participating Function SHALL support receiving 3rd party REGISTER from the SIP/IP core according to [3GPP TS 24.229] clause 5.4.1.7.

Upon receiving a SIP REGISTER request the CPM Participating Function:

1. SHALL generate a SIP 200 "OK" response according to the rules and procedures of [RFC3261]; and,

2. SHALL send the SIP 200 "OK" response according to the rules and procedures of SIP/IP core.

If the CPM Participating Function is not already subscribed to the "reg" event package as specified in [RFC3680] for the CPM User Address received in the SIP REGISTER request, the CPM Participating Function:

1. SHALL generate a SIP SUBSCRIBE request according to the rules and procedures of [RFC3265] and [RFC3680];

2. SHALL set the Request-URI of the SIP SUBSCRIBE request to the CPM User Address received in the SIP REGISTER request;

3. MAY set an expiration timer in Expires header with a value according to the rules and procedures of [RFC3903], in the same range as the registration timer recommendations for the SIP/IP core;

4. SHALL send the SUBSCRIBE request according to the rules and procedures of the SIP/IP core.

The responses to the SIP SUBSCRIBE request SHALL be handled according to the rules and procedures of [RFC3265] and [RFC3680], and rules and procedures of the SIP/IP core.

8.1.2 Receive Registration Event Information Notifications

Upon receiving a SIP NOTIFY request as the result of the "reg" event subscription, containing the Registration Event Information as specified in [RFC3680] and [RFC5628], the CPM Participating Function:

1. SHALL generate a SIP 200 "OK" response according to the rules and procedures of [RFC3265] and [RFC3680];

2. SHALL send the SIP 200 "OK" response according to the rules and procedures of SIP/IP core;

3. SHALL store the Registration Event Information, if there is no Registration Event Information already associated with the CPM User address. Otherwise, the CPM Participating Function SHALL replace the old Registration Event Information with the Registration Event Information received in the SIP NOTIFY request.

8.1.3 Terminating the Subscription to Registration Event Information

The CPM Participating Function MAY terminate the subscription at any time, according to the rules and procedures of [RFC3265] and [RFC3680].

8.1.4 Using the Registration Event Information

The Registration Event Information received and stored in the procedure described in section 8.1.2 "*Receive Registration Event Information Notifications*" allows the CPM Participating Function to determine:

1. The registration state of a CPM User; and

2. The registered devices of the CPM User that can be used to deliver the CPM requests and trigger deferred delivery to, and either the GRUU's associated with each of these devices, or the +sip.instance containing an unique instance identifier associated with each of these devices.

3. The device capabilities according to [RFC3840] of each of the devices in Step 2.

Whenever the CPM Participating Function needs to know the registration state or the registered devices of a CPM User, it SHALL use the stored Registration Event Information associated with the CPM address of a CPM User.

NOTE: Only the terminating CPM Participating Function will use this Registration Event Information to decide the handling of incoming CPM Standalone Messages, CPM File Transfers and CPM Session Invitations.

8.2 Procedures in the Originating Network

A CPM Participating Function in an originating network handles incoming CPM communications in the following manners:

- Upon receiving a SIP MESSAGE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.msg' defined in Appendix H included in the Accept-Contact header, the CPM Participating Function SHALL handle this SIP MESSAGE request as described in section 8.2.1.1 "*Handle a Pager Mode*".

- Upon receiving a SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.largemsg' defined in Appendix H included in the Accept-Contact header, the CPM Participating Function SHALL handle this SIP INVITE request as described in section 8.2.1.2 "*Handle a Large Message Mode*",

- Upon receiving a SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' defined in Appendix H included in the Accept-Contact header, the CPM Participating Function SHALL handle this SIP INVITE request as described in section 8.2.2.1 "*Handle a CPM Session Invitation*",

- Upon receiving a SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.filetransfer' defined in Appendix H included in the Accept-Contact header, the CPM Participating Function SHALL handle this SIP INVITE request as described in section 8.2.3.1 "*Handle a CPM File Transfer*",

8.2.1 CPM Standalone Message Handling

8.2.1.1 Handle a Pager Mode CPM Standalone Message

Upon receiving a SIP MESSAGE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.msg' included in the Accept-Contact header corresponding to Pager Mode CPM Standalone Message,

1. The CPM Participating Function SHALL check whether the authenticated originator's CPM Address is allowed to send the request and if not, the CPM Participating Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "127 Service not authorised" in the response according to the rules and procedures of [RFC3261];

    Otherwise, continue with rest of the steps;

2. If the CPM Participating Function requires a specific User Agent version to be supported, the CPM Participating Function SHALL check the "User Agent" header field to determine if the CPM Participating Function supports the User Agent version and if not, the CPM Participating Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "132 Version no supported" in the response according to the rules and procedures of [RFC3261].

    Otherwise, continue with rest of the steps;

3. If the CPM Participating Function does not allow anonymity and anonymity is requested, the CPM Participating Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text according set to "119 Anonymity not allowed" in the response according to the rules and procedures of [RFC3261]

Otherwise, continue with the rest of the steps;

4. If the "Expires" header is included, the CPM Participating Function SHALL check if the message is still valid. If the message is no longer valid, the message is handled as specified in [RFC3428].

   Otherwise continue with the rest of the steps;

5. The CPM Participating Function SHALL check if there are external contents in the MIME body of the message, for each Content-Type header set to the value "message/external-body" and whose access-type is set to the value "URL" and whose URL contains the parameter "action=fetch", the CPM Participating Function

   a. SHALL fetch the Media Object, CPM Standalone Message, CPM File Transfer History, CPM Session History or CPM Conversation History indicated by the URL from the Message Storage Server as described in [OMA-CPM_TS_MessageStorage].

   b. SHALL replace the value "message/external-body" in the Content-Type of CPIM body header with an appropriate value depending on the fetched data type.

   NOTE: The value in Content-Type header of CPIM body can be obtained from the stored data's Content-Type value.(e.g. if stored data is a text file whose Content-Type is "text/plain", the "text/plain" can be copied to the Content-Type header in CPM Standalone Message.)

   c. SHALL include the fetched data in the message/cpim body.

6. The CPM Participating Function SHALL check in the originator's user preferences retrieved from XDMS as described in 8.4.1 "*Retrieving User Preferences*" if there is a rule in [OMA-XDM-Policy] in which the "enabler" attribute of the '<service>' sub-element inside the '<service-list>' element of the conditions part of the rule is set to "CPM" and the '<action>' element of the rule contains an '<allow-offline-storage>' sub-element set to "true". If such a rule exists , it SHALL execute the processing described in 8.5 "*Record CPM Conversation History*";

7. The CPM Participating Function:

   i. SHALL check if:

      1. the P-Preferred-Service header field is present and carries the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.msg'. In this case, the CPM Participating Function SHALL remove the P-Preferred-Service header field and add P-Asserted-Service header field set to 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.msg'; or

      2. if P-Asserted-Service header field is present and does not contain a value of the CPM Feature Tag of 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.msg', it MAY respond with a 403 'Forbidden' SIP response;

8. The CPM Participating Function SHALL check the message size. If the maximum size of the message (after insertion of external content in step 5 is not larger than 1300 bytes, the CPM Participating Function:

   a. If the destination address is neither SIP URI address nor TEL URI address, the CPM Participating Function SHALL forward the SIP MESSAGE directly to the ISF as described in section 6.5 "*Communicating with the ISF*".

      i. Otherwise, the CPM Participating Function SHALL forward the SIP MESSAGE request to the SIP/IP core.

      ii. Upon receiving an error response to the SIP MESSAGE request, e.g. SIP 404 "Not Found", SIP 488 "Not Acceptable Here" or SIP 606 "Not Acceptable", the CPM Participating Function:

         1. SHALL check if service provider policy allows to initiate interworking;

         2. If interworking is allowed, it SHALL send the SIP MESSAGE request directly to the ISF as described in section 6.5 "*Communicating with the ISF*".

         Otherwise, continue with the rest of the steps.

   b. Upon receiving a SIP final response, the CPM Participating Function SHALL use this SIP final response as the final response for the delivery of the CPM Standalone Message.

9. Otherwise, when the message size is larger than 1300 bytes the CPM Participating Function:

a. SHALL generate an initial SIP INVITE request according to the rules and procedures of [RFC3261], with the following clarifications:

   i. SHALL copy the Accept-Contact header included in the incoming SIP MESSAGE request to the outgoing SIP INVITE request, and replace the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.msg' value in the g.3gpp.icsi-ref media feature tag by 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.largemsg' percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 *"Coding of the ICSI"*;

   ii. SHALL check if:

      1. the P-Preferred-Service, header field is present and carries the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.msg'. In this case, the CPM Participating Function SHALL remove the P-Preferred-Service header field and add P-Asserted-Service header field set to 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.largemsg'; or

      2. if P-Asserted-Service header field is present and carries the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.msg', it SHALL replace the value in P-Asserted-Service with 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.largemsg';;

   iii. SHALL copy the authenticated originator's CPM Address to the outgoing SIP INVITE request if it was included in the incoming SIP MESSAGE request;

   iv. SHALL copy the Reply-To header to the outgoing SIP INVITE request if it was included in the incoming SIP MESSAGE request.

   v. SHALL include a User-Agent header to indicate the CPM release version as specified in Appendix D *"Release Version in User-agent and Server headers"*;

   vi. SHALL copy the Privacy header to the outgoing SIP INVITE request if it was included in the incoming SIP MESSAGE request;

   vii. SHALL include the option tag 'timer' in the Supported header;

   viii. SHALL include the "Message-Expires" header in the outgoing SIP INVITE request as defined in Appendix C *"CPM-defined SIP Header* fields" using the value from the incoming Expires header if it was included in the incoming SIP MESSAGE request.

   ix. SHOULD include the Session-Expires header with the refresher parameter set to "uac" according to the rules and procedures of [RFC4028];

   x. SHALL copy the Request-URI to the outgoing SIP INVITE request from the incoming SIP MESSAGE request;

   xi. SHALL copy the MIME resource-list body to the outgoing SIP INVITE request if it was included in the incoming SIP MESSAGE request;

   xii. SHALL copy the Conversation-ID to the outgoing SIP INVITE request from the incoming SIP MESSAGE request;

   xiii. SHALL copy the Contribution-ID to the outgoing SIP INVITE request from the incoming SIP MESSAGE request;

   xiv. SHALL, if present, copy the InReplyTo-Contribution-ID to the outgoing SIP INVITE request from the incoming SIP MESSAGE request;

   xv. SHALL include in the SIP INVITE request a MIME SDP body as an SDP offer according to the rules and procedures of [RFC3264], [RFC4566], [RFC4975] and [RFC6135] with the following clarifications:

      1. SHALL set the SDP directional media attribute to a=sendonly;

      2. SHALL set the content type as a=accept-types:message/cpim;

      3. SHALL set MSRP URI for the MSRP connection setup as a=path:MSRP URI;

      4. SHALL set the size as a=file-selector:size:actual message size;

5. SHALL set the a=setup attribute as "active";

b. If the destination address is neither SIP URI address nor TEL URI address, the CPM Participating Function SHALL send the SIP INVITE request directly to the ISF as described in section 6.5 "*Communicating with the ISF*".

Otherwise, the CPM Participating Function SHALL send the SIP INVITE request according to the rules and procedures of the SIP/IP core.

c. Upon receiving a SIP 200 "OK" response to the SIP INVITE request, the CPM Participating Function:

   i. SHALL start the SIP session timer using the value received in the Session-Expires header according to the rules and procedures of [RFC4028];

   ii. SHALL act as MSRP client according to [RFC6135];

   iii. SHALL act as an "active" endpoint to open the transport connection according to[RFC6135] ;

   iv. SHALL establish the MSRP connection according to the MSRP connection parameters in the SDP answer received in the SIP 200 "OK" response according to [RFC6135];

   v. SHALL generate and send a SIP ACK request as an acknowledgement of the final response according to the rules and procedures of [RFC3261];

   vi. SHALL generate one or more MSRP SEND requests (depending on whether chunking is required) according to the rules and procedure of [RFC4975] with the following clarification:

     a. SHALL set To-Path header according to the MSRP URI(s) received in the answer SDP;

     b. SHALL set the content type as Content-Type = message/cpim;

     c. If the original SIP MESSAGE request requested for a disposition notification, it SHALL set the disposition notification request in the MSRP SEND request as an extension header as described in section **Error! Reference source not found.** "*Error! Reference source not found.*";

     d. SHALL send the MSRP SEND request(s) on the established MSRP connection.

   vii. When the last MSRP SEND request (representing the last chunk) has been sent and acknowledged, the CPM Participating Function:

     a. SHALL generate a SIP BYE request according to the rules and procedures of [RFC3261];

     b. SHALL send the SIP BYE request according to the rules and procedures of SIP/IP core;

     c. SHALL use the status of the MSRP send request(s) as the final response for the delivery of the CPM Standalone Message.

     d. Upon receiving an error response from the SIP/IP core, e.g. SIP 404 "Not Found", SIP 488 "Not Acceptable Here" or SIP 606 "Not Acceptable", or upon receiving an error response to an MSRP SEND request sent in step c, the CPM Participating Function SHALL, if interworking has not yet been attempted, and if allowed according to service provider policy, send the SIP INVITE request directly to the ISF as described in section 6.5 "*Communicating with the ISF*".

10. Upon receiving the final response for the delivery of the CPM Standalone Message to the terminating network, the CPM Participating Function:

a. If the SIP final response is a SIP 200 OK response, the CPM Participating Function SHALL:

   i. If the user preference for recording was set to record the CPM Conversation History,

     a. SHALL store the CPM Standalone Message to the Message Storage Server according to procedures specified in section 6.3.1 "*Object Store Operation*" of [OMA-CPM_TS_MessageStorage] and retrieve an UID from the Message Storage Server;

     b. If recording was successful, SHALL include in the SIP final response the Message-UID header set to the retrieved UID information as specified in Appendix C.1.6 "*Message-UID*";

       ii. SHALL send a SIP 200 "OK" final response for the received SIP MESSAGE request in accordance with [RFC3428].

   b. Otherwise, the CPM Participating Function SHALL send an appropriate SIP error response for the received SIP MESSAGE request in accordance with [RFC3428].

8.2.1.2 Handle a Large Message Mode CPM Standalone Message

Upon receiving an initial SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.largemsg' included in the Accept-Contact header corresponding to Large Message Mode CPM Standalone Message, the CPM Participating Function:

1. SHALL check whether the authenticated originator's CPM Address is of a CPM User that is allowed to send the request and if not, the CPM Participating Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "127 Service not authorised" in the response according to the rules and procedures of [RFC3261];

   Otherwise, continue with rest of the steps;

2. If the CPM Participating Function requires a specific User Agent version to be supported, the CPM Participating Function SHALL check the "User Agent" header field to determine if the CPM Participating Function supports the User Agent version and if not, the CPM Participating Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "132 Version not supported" in the response according to the rules and procedures of [RFC3261].

   Otherwise, continue with rest of the steps;

3. If the CPM Participating Function does not allow anonymity and anonymity is requested, the CPM Participating Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "119 Anonymity not allowed" in the response according to the rules and procedures of [RFC3261].

   Otherwise, continue with the rest of the steps;

4. If the "Message-Expires" header as defined in Appendix C "*CPM-defined SIP Header* fields" is included, the CPM Participating Function SHALL check if the message is still valid. If the message is no longer valid, the message is handled in the same way as for an "Expires" header in a SIP MESSAGE as defined in [RFC3428];

   Otherwise continue with the rest of the steps;

5. If the "Session-Expires" header is included, the CPM Participating Function SHOULD handle the header according to procedures of [RFC4028];

6. SHALL behave as a B2BUA according to the rules and procedures of [RFC3261] for the duration of the SIP session;

7. SHALL generate a SIP INVITE request according to the rules and procedures of [RFC3261] with the following clarifications:

   a. The CPM Participating Function SHALL include the Request-URI received in the SIP INVITE request;

   b. The CPM Participating Function SHALL copy the Accept-Contact header included in the incoming SIP INVITE request to the outgoing SIP INVITE request percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 *"Coding of the ICSI"*;

   c. The CPM Participating Function SHALL check if in the received SIP INVITE:

       i. the P-Preferred-Service header field is present and carries the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.largemsg'. In this case, the CPM Participating Function SHALL remove the P-Preferred-Service header field and add P-Asserted-Service header field and set it to 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.largemsg'; orif P-Asserted-Service header field is present and carries the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.largemsg'. If another value is found, the CPM Participating Function MAY reject the SIP INVITE with a SIP 403 "Forbidden" response.

   d. The CPM Participating Function SHALL copy the Contact header of the incoming SIP INVITE request to the outgoing SIP INVITE request;

      e.   The CPM Participating Function SHALL insert a URI identifying its own address in the Contact header;

      f.   The CPM Participating Function SHALL include a MIME SDP body received in the SIP INVITE request as an SDP offer according to the rules and procedures of [RFC3264], [RFC4566], [RFC4975], [RFC6135] and [draft-ietf-simple-msrp-sessmatch] with the following clarification. The CPM Participating Function:

          i.   SHALL include a media line proposing MSRP media parameters;

         ii.   SHALL prepend its own MSRP URI for the MSRP connection setup as a=path:MSRP URI;

        iii.   SHALL set the SDP directional media attribute to a=sendonly;

        iv.   SHALL set the size as a=file-selector:size:actual message size;

         v.   SHALL set the a=setup attribute as "active".

8.   SHALL, if the destination address is neither a SIP URI address nor a TEL URI address, send the SIP INVITE request directly to the ISF as described in section 6.5 "*Communicating with the ISF*". Otherwise, the CPM Participating Function SHALL send the SIP INVITE request according to the rules and procedures of the SIP/IP core.

Upon receiving a SIP 200 "OK" response to the SIP INVITE request sent in step 8 above, the CPM Participating Function:

1.   SHALL generate a SIP 200 "OK" response according to the rules and procedures of [RFC3261];

2.   SHALL include a URI identifying its own address in the Contact header;

3.   SHALL include a Server header to indicate the CPM release version as specified in Appendix D "*Release Version in User-agent and Server headers*";

4.   SHALL include the SDP received in the response to the SIP INVITE request as answer SDP according to the rules and procedures of [RFC3264], [RFC4566], [RFC4975], [RFC6135] and [draft-ietf-simple-msrp-sessmatch] with the following clarifications:

      a.   The CPM Participating Function SHALL include a media line proposing MSRP media parameters;

      b.   The CPM Participating Function SHALL prepend its own MSRP URI for the MSRP connection setup as a=path:MSRP URI;

      c.   The CPM Participating Function SHALL set the SDP directional media attribute to a=recvonly.;

      d.   The CPM Participating Function SHALL set the a=setup attribute as "passive".

5.   SHALL send the SIP 200 "OK" response according to the rules and procedures of SIP/IP core;

6.   SHALL check in the originator's user preferences retrieved from XDMS as described in 8.4.1 "*Retrieving User Preferences*" if there is a rule in [OMA-XDM-Policy] in which the "enabler" attribute of the '<service>' sub-element inside the '<service-list>' element of the conditions part of the rule is set to "CPM" and the '<action>' element of the rule contains an '<allow-offline-storage>' sub-element set to "true". If such a rule exists, it SHALL execute the processing described in 8.5 "*Record CPM Conversation History*".

Upon receiving an error response from the SIP/IP core, e.g. SIP 404 "Not Found" or SIP 488 "Not Acceptable Here" or SIP 606 "Not Acceptable", the CPM Participating Function SHALL, if allowed according to service provider policy, send the SIP INVITE request generated in step 7 above directly to the ISF as described in section 6.5 "*Communicating with the ISF*".

Upon receiving a SIP CANCEL request, the CPM Participating Function:

1.   SHALL act as UAS to handle the SIP CANCEL request according to the rules and procedures of [RFC3261]; and,

2.   SHALL act as UAC to cancel the sent SIP INVITE request according to the rules and procedures of [RFC3261].

Upon receiving a SIP ACK request, the CPM Participating Function SHALL forward the SIP ACK request to SIP/IP core according to the rules and procedures of the SIP/IP core.

Upon receiving an MSRP SEND request, the CPM Participating Function:

1.   If the MSRP SEND request indicates the use of chunking, SHALL wait until all further MSRP SEND requests for the remaining chunks have been received and SHALL reassemble the entire set of MSRP requests into the CPM Standalone Message,

2. SHALL check if there are external contents in the MIME body of the message, and for each Content-Type header set to the value "message/external-body" and whose access-type is set to the value "URL" and whose URL contains the parameter "action=fetch", the CPM Participating Function:

   a. SHALL fetch the Media Object, CPM Standalone Message, CPM File Transfer History, CPM Session History or CPM Conversation History indicated by the URL from the Message Storage Server.

   b. SHALL replace the value "message/external-body" in the Content-Type of CPIM body header with an appropriate value depending on the fetched data type.

   NOTE: The value for the Content-Type header of the CPIM body can be obtained from the stored data's Content-Type value (e.g. if stored data is a text file whose Content-Type is "text/plain", the "text/plain" can be copied to the Content-Type header in the CPM Standalone Message).

   c. SHALL include the fetched data in the message/cpim body.

3. SHALL select an existing MSRP connection if available according to the rules and procedures of [RFC4975]; or

4. SHALL act as an "active" endpoint to open the transport connection according to [RFC6135]; and

5. SHALL establish the MSRP connection according to the MSRP connection parameters in the SDP answer received in the SIP 200 "OK" response according to [RFC4975];

6. SHALL forward the MSRP SEND request towards the adjacent MSRP node via the established MSRP connection according to the rules and procedures of [RFC4975].

Upon receiving an MSRP 200 "OK" response, the CPM Participating Function SHALL forward the MSRP 200 "OK" response according to the rules and procedures of [RFC4975].

Upon receiving an error MSRP response to the MSRP SEND request, if interworking has not yet been attempted and if allowed according to service provider policy, the CPM Participating Function SHALL send the SIP INVITE request generated in step 7 above directly to the ISF as described in section 6.5 "*Communicating with the ISF*" and once a SIP session is established with an IWF, the CPM Participating Function SHALL transfer the Large Message Mode CPM Standalone Message using MSRP. If still an error MSRP response is received, the CPM Participating Function SHALL return the error response to the sender.

Upon receiving a SIP BYE request from the originating CPM User, the CPM Participating Function:

1. If MSRP message delivery was successful and if the user preference was set to record the CPM Conversation History, SHALL store the CPM Standalone Message to the Message Storage Server according to procedures specified in section 6.3.1 "*Object Store Operation*" of [OMA-CPM_TS_MessageStorage] and retrieve an UID from the Message Storage Server;

2. SHALL respond to the SIP BYE request as described in [RFC3261] and if the message was recorded, SHALL include in the 200 "OK" response the Message-UID header set to the retrieved UID information as specified in Appendix C.1.6 "Message-UID";

3. SHALL forward the SIP BYE request to the SIP/IP core *according to rules and procedures of the SIP/IP core*.

8.2.2 CPM Session Handling

A CPM Participating Function in the originating network may or may not stay in the media path depending on service provider's policies. The policies may be static such that the CPM Participating Function always stays or always does not stay in the media path, or the policies may depend on parameters such as:

1. If a CPM User has a subscription to the Message Storage Server and a user preference is set to record CPM Conversation History when he sends a CPM Session Invitation;

2. If the CPM Participating Function needs to do charging.

3. If the CPM Session is a CPM Group Session, to be able to support deferred delivery if needed.

When a CPM Participating Function stays in the media path acting as a back-to-back user agent (B2BUA), the following applies:

1. The CPM Participating Function acts as a user agent for both SIP sessions it connects. The B2BUA behaves as a user agent server for the incoming side and as a user agent client for the outgoing side(s).

2. The CPM Participating Function correlates both sides of the SIP session, by mapping the corresponding SIP session identities of the SIP sessions, and it maintains session state for all SIP sessions it handles, thus enabling end-to-end communication.

8.2.2.1　Handle a CPM Session Invitation

Upon receiving a SIP INVITE request for a CPM 1-1 Session or a CPM Group Session:

1. The CPM Participating Function SHALL check whether the authenticated originator's CPM Address is of a CPM User that is allowed to send the request and if not, the CPM Participating Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "127 Service not authorised" in the response according to the rules and procedures of [RFC3261].

   Otherwise, continue with rest of the steps;

2. If the CPM Participating Function requires a specific User Agent version to be supported, the CPM Participating Function SHALL check the "User Agent" header field to determine if the CPM Participating Function supports the User Agent version as defined in Appendix D "*Release Version in User-agent and Server headers*" and if not, the CPM Participating Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "132 Version not supported" in the response according to the rules and procedures of [RFC3261].

   Otherwise, continue with rest of the steps;

3. If the CPM Participating Function does not allow anonymity and anonymity is requested, the CPM Participating Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "119 Anonymity not allowed" in the response according to the rules and procedures of [RFC3261]

   Otherwise, continue with the rest of the steps;

4. If the CPM Participating Function stays in the media path, the CPM Participating Function:

   a. SHALL copy the received Request-URI;

   b. SHALL behave as a B2BUA according to the rules and procedures of [RFC3261] for the duration of the CPM Session;

   c. SHALL generate a SIP INVITE request according to the rules and procedures of [RFC3261];

   d. SHALL include a User-Agent header to indicate the OMA CPM release version of the CPM Participating Function as specified in Appendix D "*Release Version in User-agent and Server headers*";

   e. SHALL copy the Contact header and the Accept-Contact header of the incoming SIP INVITE request to the outgoing SIP INVITE request;

   f. SHALL check if in the received SIP INVITE:

      i. the P-Preferred-Service header field is present and carries the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session'. In this case, the CPM Participating Function SHALL remove the P-Preferred-Service header field and add P-Asserted-Service header field and set it to 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session'; or

      ii. if P-Asserted-Service header field is present and carries the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session'. If another value is found, the CPM Participating Function MAY reject the SIP INVITE with a SIP 403 "Forbidden" response;

   g. SHALL insert a URI identifying its own address in the Contact header of the SIP INVITE request;

   h. SHALL include an SDP body as an SDP offer in the SIP INVITE request based on the received SDP from the originating client, as described in section 5.2.1.2 "*SDP Handling at Intermediate Nodes*";

   i. If the destination address is neither SIP URI address nor TEL URI address, the CPM Participating Function SHALL send the SIP INVITE request directly to the ISF as described in section 6.5 "*Communicating with*

the ISF". Otherwise the CPM Participating Function SHALL send the SIP INVITE request according to the rules and procedures of the SIP/IP core.

5. If the CPM Participating Function does not stay in the media path, the CPM Participating Function:

   a. SHALL act as a SIP proxy according to the rules and procedures of [RFC3261] for the duration of the CPM Session;

   b. SHALL include a Record-Route header containing a URI identifying its own address; and,

   c. If the destination address is neither SIP URI address nor TEL URI address, the CPM Participating Function SHALL forward the SIP INVITE request directly to the ISF as described in section 6.5 "*Communicating with the ISF"*. Otherwise, the CPM Participating Function SHALL forward the SIP INVITE request according to the rules and procedures of [RFC3261] and the SIP/IP core.

Upon receiving a SIP 200 "OK" response, if the CPM Participating Function is acting as a B2BUA, the CPM Participating Function:

1. If the SIP 200 "OK response was received from the ISF, the CPM Participating Function SHALL check whether the all offered Media Streams have been accepted. If not, the CPM Participating Function MAY attempt to establish a new session for the rejected Media Streams. To establish the new session the CPM Participating Function:

   a. SHALL check if service provider policy allows to establish a new session for the new Media Stream;

   b. If allowed, SHALL generate a SIP INVITE request with the following details;

      i. SHALL perform the above step 4 with the exception of step 4-f and step 4-g;

      ii. SHALL include SDP parameters about the rejected Media Streams in the SDP body, as described in section 5.2.1.2 "*SDP Handling at Intermediate Nodes*" ;

      iii. SHALL send the SIP INVITE request directly to the ISF.

   Otherwise, continue with the rest of steps;

2. SHALL generate a SIP 200 "OK" response;

3. SHALL include a Server header to indicate the OMA CPM release version of the CPM Participating Function as specified in Appendix D "*Release Version in User-agent and Server headers*";

4. SHALL include the received SDP body as an SDP answer based on the SDP answer received in the SIP 200 "OK" response as described in section 5.2.1.2 "*SDP Handling at Intermediate Nodes*;

5. SHALL include a SIP URI in the Contact header that can resolve back to the original SIP URI in the received Contact header:

6. SHALL send the SIP 200 "OK" response to the CPM Client according to the rules and procedures of SIP/IP core; and,

7. SHALL check the <actions> element <allow-offline-storage> retrieved from XDMS as described in 8.4.1 "*Retrieving User Preferences*", and if set to "true", it SHALL execute the processing described in 8.5 "*Record CPM Conversation History*".

   a. In the case where the CPM Participating Function uses a Session History Folder for the CPM Session, the CPM Participating Function SHALL verify if a Session History Folder whose name matches the Contribution-ID exists, and:

      i. If one does exist, SHALL skip the creation of the session info object;

      ii. If one does NOT exist, SHALL first create a Session History Folder with the folder name set to the Contribution-ID value and then create a session info object for this session in this folder and then retrieve a UID from the Message Storage for the newly created session info object.

Upon receiving a SIP 200 "OK" response, and when the CPM Participating Function is acting as a SIP proxy, the CPM Participating Function:

1. SHALL forward the SIP 200 "OK" response toward the initiating CPM Client according to the rules and procedures of [RFC3261] and the SIP/IP core; and,

2. SHALL continue to act as a SIP proxy for the duration of the CPM Session.

Upon receiving an error response, e.g. SIP 404"Not Found" or SIP 488 "Not Acceptable Here" or SIP 606 "Not Acceptable", based on service provider policies, the CPM Participating Function:

1. SHALL check if service provider policy allows to initiate interworking;

2. If interworking is allowed, it SHALL send the SIP INVITE request directly to the ISF as described in section 6.5 "*Communicating with the ISF*";

3. Otherwise, it SHALL forward the SIP INVITE error response towards the originating CPM Client.

Upon receiving a SIP ACK request, the CPM Participating Function SHALL forward the SIP ACK request to the SIP/IP core according to the rules and procedures of the SIP/IP core.

8.2.2.2 Handle a Cancel Request

Upon receiving a SIP CANCEL request, the CPM Participating Function performing as a B2BUA:

1. SHALL act as UAS according to the rules and procedures of [RFC3261];

2. SHALL cancel the SIP INVITE request towards the SIP/IP core according to the rules and procedures of [RFC3261].

When acting as a SIP proxy, rules and procedures as specified in [RFC3261] SHALL be applied.

8.2.2.3 Handle a SIP BYE Request

Upon receiving a SIP BYE request associated with an existing CPM Session, a CPM Participating Function that acts as a SIP proxy SHALL forward the received SIP BYE request along the Signalling Path and upon receiving the SIP 200 "OK" response associated with the SIP BYE request, the CPM Participating Function SHALL forward the SIP 200 "OK" response along the same Signalling Path as the SIP BYE request according to the rules and procedures of [RFC3261].

Upon receiving a SIP BYE request associated with an existing CPM Session, a CPM Participating Function SHALL check if a Reason header field is present.

If a Reason header field is not present (e.g. the served CPM Client is a CPM v1.0 Client), then the CPM Participating Function SHALL continue with step A) below.

If present, the CPM Participating Function SHALL check the values in the Reason header field to determine if the SIP BYE was generated by the CPM Client, or another entity, as follows:

- If the Reason Header field (as defined in [RFC3326]) has a value set to SIP;cause=200;and MAY have a text parameter containing an explanatory String (e.g. "Call completed", or other), then the SIP BYE was generated by the CPM Client as result to CPM User's explicit leave of the CPM Session, or by the CPM IWF entity acting on behalf of the CPM User that has left; In this case, the CPM Participating Function SHALL continue with the step 1 below.

- If the Reason Header field (as defined in [RFC3326]) has a value set to SIP;cause=410; and MAY have a text parameter containing an explanatory String (e.g. "Gone", or other), then the SIP BYE was generated by the CPM Controlling Function as result of terminating the CPM Group Session (without the possibility to be re-started as CPM Long-lived Group Session);

- If the Reason Header field (as defined in [RFC3326]) has a value set to SIP;cause=480; and MAY have a text parameter containing an explanatory String (e.g. "Bearer unavailable", or other), then the SIP BYE was generated by the CPM Controlling Function as result of expiry of inactivity timer of the CPM Group Session (which can further be re-started as CPM Long-lived Group Session);

- If the Reason Header field has any other values, such as *Reason: SIP;cause=503;text="Service Unavailable"* as defined in [3GPP TS24.229], then the SIP BYE was generated by a node of the SIP/IP Core and may indicate a connection loss with the served CPM Client.

If the CPM Participating Function acts as a B2BUA then:

1. If the SIP BYE request was sent by the CPM Client served by the CPM Participating Function, the CPM Participating Function:

      a. SHALL release the Media Plane resources associated with the CPM session;

      b. If the affected CPM Session is being interworked, the CPM Participating Function:

            i. SHALL generate SIP BYE requests for each of the associated IWFs according to the rules and procedures of [RFC3261];

            ii. SHALL send these SIP BYE requests to the IWFs according to the rules and procedures of [RFC3261].

      c. Otherwise, when the affected CPM Session is not being interworked, the CPM Participating Function:

            i. SHALL generate a SIP BYE request for the other CPM entity of the affected CPM Session according to the rules and procedures of [RFC3261];

            ii. SHALL send the SIP BYE request according to the rules and procedures of [RFC3261].

      d. Upon receiving a SIP 200 "OK" response from the IWFs or the other CPM entity associated with the SIP BYE request, the CPM Participating Function:

            i. SHALL generate a SIP 200 "OK" response according to the rules and procedures of [RFC3261];

            ii. If the action element <allow-offline-storage> is set to true and is using a CPM Session History Folder, the CPM Participating Function:

                1. SHALL create and store the Group State Object.;

                2. SHALL include in the SIP 200 "OK" response a Message-UID header set to the retrieved UID information as defined in the session info object of the CPM Session.

            iii. SHALL send the SIP 200 "OK" response according to the rules and procedures of [RFC3261].

2. If the SIP BYE request was sent by the other CPM entity (e.g. by the CPM Controlling Function terminating the CPM Group Session, or in a 1-1 CPM Session by the other CPM User's Participating Function), the CPM Participating Function:

      a. SHALL release the Media Plane resources associated with the CPM session;

      b. SHALL generate a SIP BYE request for the CPM Client that it serves according to the rules and procedures of [RFC3261];

      c. If the action element <allow-offline-storage> is set to true, the CPM Participating Function:

            i. SHALL store the CPM Session to the Message Storage Server according to procedures specified in section 8.5.2 "*Record CPM Session*" and retrieve a UID from the Message Storage Server;

            ii. SHALL include in the SIP BYE request a Message-UID header set to the retrieved UID information as defined in Appendix C "*CPM-defined SIP Header* fields".

      d. SHALL send the SIP BYE request according to the rules and procedures of [RFC3261].

      e. Upon receiving a SIP 200 "OK" response from the CPM Client associated with the SIP BYE request, the CPM Participating Function SHALL generate and send a SIP 200 "OK" response towards the other CPM entity according to the rules and procedures of [RFC3261] and the SIP/IP core.

3. If the SIP BYE request was sent by one of the IWFs involved in the interworking of the CPM Session, the CPM Participating Function:

      a. SHALL release the Media Plane resources associated with the CPM session;

      b. If the CPM Session is interworked towards multiple IWFs and the service provider policies indicate that only the Media Streams associated with the IWF that sent the SIP BYE request are to be closed, the CPM Participating Function SHALL send a SIP re-INVITE request for deleting the Media Streams associated with the IWF that sent the SIP BYE request to the CPM Client, according to the rules and procedures of [RFC3261] and the SIP/IP core.

      c. Otherwise, if the CPM Session is interworked towards multiple IWFs and the service provider policies indicate closure of the entire CPM Session, or the CPM Session is interworked to a single IWF, the CPM Participating Function:

        i. SHALL generate a SIP BYE request for the CPM Client that it serves according to the rules and procedures of [RFC3261];

        ii. If the action element <allow-offline-storage> is set to true, the CPM Participating Function:

            1. SHALL store the CPM Session to the Message Storage Server according to procedures specified in section 8.5.2 "*Record CPM Session*" and retrieve a UID from the Message Storage Server;

            2. SHALL include in the SIP BYE request a Message-UID header set to the retrieved UID information as defined in Appendix C "*CPM-defined SIP Header* fields".

        iii. SHALL send the SIP BYE request according to the rules and procedures of [RFC3261].

        iv. Upon receiving a SIP 200 "OK" response from the CPM Client associated with the SIP BYE request, the CPM Participating Function SHALL generate and send a SIP 200 "OK" response towards the IWF according to the rules and procedures of [RFC3261].

4. If the SIP BYE request was sent by another entity (e.g. a SIP/IP Core node upon connection loss with the served CPM Client), the CPM Participating Function SHALL check relevant settings for the CPM User:

    a. if the action element includes an <allow-offline-storage> sub-element from user preferences is set to true for the CPM User, or

    b. if the action element includes an '<allow-store>' sub-element set to "true", or

    c. if the action element includes an '<allow-defer>' sub-element set to "true", or

    d. if the service provider policies allow the CPM User to re-start CPM Long-lived Group Sessions,

If any one of a, b, c, d is true then the CPM Participating Function SHALL remain in the media path of the active CPM Group Session, after a connection loss with the served CPM Client, and it:

        i. SHALL release the Media Plane resources towards the served CPM Client for this CPM session; and SHALL send a SIP SUBSCRIBE to the CPM Controlling Function of that CPM Group Session, as described in sect. 8.2.2.6 "*Handling of Participants Information*".

        ii. This will allow the CPM Participating Function to provide (or record, depending on the user preferences), the last list of participants to the CPM Group Session, and

        iii. If the user preferences are set in any one of cases a, b, c above then the CPM Participating Function SHALL intercept all messages and disposition notifications exchanged throughout the duration of the CPM Group Session, for a later delivery to the CPM Client, or for recording in the CPM Message Storage of the CPM User.

Otherwise if the CPM Participating Function does not need to remain in the media path, then it will proceed with releasing all Media Plane resources associated with this CPM Group Session and SHALL propagate the SIP BYE request according to the rules and procedures of [RFC3261].

8.2.2.4 SIP Session Timer Expiry

On expiry of the SIP session timer and if the CPM Participating Function is behaving as a B2BUA for the affected CPM Session, the CPM Participating Function:

1. SHALL generate a SIP BYE request for the CPM Client that the CPM Participating Function serves according to the rules and procedures of [RFC3261];

2. If the action element <allow-offline-storage> is set to true, the CPM Participating Function:

    a. If a CPM Session History Folder is used, it SHALL create and store Group State Object in the CPM Session History Folder.

    b. SHALL include in the SIP BYE request the Message-UID header set to the retrieved UID information as defined in Appendix C "*CPM-defined SIP Header* fields".

3. SHALL send the SIP BYE request according to the rules and procedures of [RFC3261];

4. If the affected CPM Session is being interworked, the CPM Participating Function:

   a. SHALL generate SIP BYE requests for each of the associated IWFs according to the rules and procedures of [RFC3261];

   b. SHALL send these SIP BYE requests according to the rules and procedures of [RFC3261].

5. Otherwise, when the affected CPM Session is not being interworked, the CPM Participating Function:

   a. SHALL generate a SIP BYE request for the other CPM entity of the affected CPM Session according to the rules and procedures of [RFC3261];

   b. SHALL send the SIP BYE request according to the rules and procedures of [RFC3261].

6. SHALL release all Media Plane resources associated with the CPM Session according to the rules and procedures of [RFC3261] and [RFC4028].

If the CPM Participating Function behaves as a SIP proxy, it SHALL act as specified in [RFC4028].

8.2.2.5 Handle a CPM Session Modification Request

Upon receiving a SIP re-INVITE request the CPM Participating Function:

1. SHALL act as specified in section 8.2.2.1 "*Handle a CPM Session Invitation*" except for step 4;

2. If the CPM Participating Function is a B2BUA:

   a. SHALL generate a SIP re-INVITE request according to the rules and procedures of [RFC3261]

   b. SHALL include the same URI identifying its own address that was used in the initial SIP INVITE request in the Contact header of the SIP re-INVITE request;

3. If the CPM Participating Function is acting as a SIP proxy, SHALL remove its own address from the Route header in the received SIP re-INVITE request according to the rules and procedures of [RFC3261];

4. If the CPM Session to be modified was established with IWF(s), it SHALL perform the following procedures:

   a. If the SIP re-INVITE request is removing existing Media Streams or changing characteristics of existing Media Streams, it SHALL send the SIP re-INVITE request to the IWF involved in that Media Stream;

   b. If the SIP re-INVITE request is adding a new Media Stream, it SHALL sequentially fork the SIP re-INVITE request to IWF(s) involved in the CPM Session until one of the IWFs responds with a SIP 200 "OK" response or all IWFs have been tried.

5. Otherwise, it SHALL send the SIP re-INVITE request according to the rules and procedures of the SIP/IP core.

Upon receiving a SIP final response, the CPM Participating Function SHALL act as specified in section 8.2.2.1 "*Handle a CPM Session Invitation*".

Upon receiving a SIP 488 "Not Acceptable Here" response from all IWFs that the SIP re-INVITE request for adding a new Media Stream was sent to, the CPM Participating Function responsible for making interworking decision MAY, if service provider policy allows this, establish a new session towards an IWF for the new Media Stream; otherwise, the CPM Participating Function SHALL forward the SIP 488 "Not Acceptable Here" response according to the rules and procedures of the SIP/IP core.

In order to establish a new session towards an IWF for the new Media Stream, the CPM Participating Function SHALL generate a SIP INVITE request according to the rules and procedures of [RFC3261] with the following clarifications:

1. SHALL include a MIME SDP body for the new Media Stream as an SDP offer in the SIP INVITE request.

2. SHALL send the SIP INVITE to the ISF as described in section 6.5 "*Communicating with the ISF*".

Upon receiving a SIP ACK request, the CPM Participating Function SHALL forward the SIP ACK request to the SIP/IP core according to the rules and procedures of the SIP/IP core for delivery to the entity that accepted the session modification.

8.2.2.6 Handling of Participants Information

When a CPM Participating Function needs to obtain the Participants Information of a CPM Group Session, it subscribes to the CPM Controlling Function hosting the focus, using the conference event package described in [RFC4575].

The CPM Participating Function:

1. SHALL generate a SIP SUBSCRIBE request, according to the rules and procedures of [RFC3265] and [RFC4575];

2. SHALL set the Request-URI of the SIP SUBSCRIBE request to the CPM Group Session Identity;

3. SHALL include an Accept-Contact header with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 *"Coding of the ICSI"* in a g.3gpp.icsi-ref media feature tag;

4. SHALL set the P-Preferred-Service header field with the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session';

5. SHALL include a Contact header with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 *"Coding of the ICSI"* in a g.3gpp.icsi-ref media feature tag;

6. SHALL populate the From header field with CPM Participating Function's own SIP URI such as the CPMDeferredMsgMgmtURI;

7. SHALL set the P-Asserted-Identity header field to the SIP URI of the CPM User's SIP URI;

8. SHALL send the SIP SUBSCRIBE request according to the rules and procedures of the SIP/IP core.

The response to the SIP SUBSCRIBE request SHALL be handled according to the rules and procedures of [RFC3265] and [RFC4575], and rules and procedures of the SIP/IP core.

When the CPM Participating Function needs to terminate the subscription, it SHALL proceed according to the rules and procedures of [RFC3265].

Note: The CPM Participating Function should keep locally the latest Participants Information received in the SIP NOTIFY to be delivered to CPM Client as part of the deferred delivery of the CPM Group Session to the CPM Client.

8.2.2.6.1 Receive Participant Information Notification

Upon receiving an incoming SIP NOTIFY request that is part of the same SIP dialog as a previously sent SIP SUBSCRIBE request for subscribing to participation information, the CPM Participating Function:

1. SHALL handle the request according to the rules and procedures of [RFC3265] and [RFC4575];

2. when receiving Subscription-State header to "terminated; reason=noresource" indicating that the CPM groups Sessions is now terminated or inactive, then:

    - if the action element includes an '<allow-store>' sub-element set to "true", or

    - a sub-element <allow-offline-storage> set to true,

then CPM Participating Function SHALL store the Participant Information into the Group State Object in the CPM Message Store Server under the CPM Session folder.

8.2.2.7 CPM Group Session Re-join Requests

8.2.2.7.1 General Re-join Handling

The CPM Participating Function SHALL determine that a re-join request was sent by a CPM Client when the received SIP INVITE has the following header fields as described in [RFC4579]:

- Contains a Request-URI set to a CPM Group Session Identity,

- The body does not include a partipants list (as opposed to a regular new CPM Group Session request which would contains the participants list),

- The Contact header is set to the CPM Group Session Identity, as described in [RFC4579].

If the CPM Participating Function has service provider policies that determine whether the CPM Long-lived Group Session is supported or not, then the CPM Participating Function SHALL further handle it as described in sect. 8.2.2.7.2. "CPM Long-lived Groups Session". Otherwise, the CPM Participating Function SHALL always forward the SIP request to the CPM Controlling Function.

8.2.2.7.2 CPM Long-lived Group Session

Upon receiving a re-join SIP INVITE request from a CPM Client to a CPM Long-lived Group Session, the CPM Participating Function process the request as follows:

If the CPM Group Session is inactive:

1) If the CPM Client is allowed to re-start the CPM Long-lived Group Session which is now inactive, the CPM Participating Function SHALL act as specified in section 8.2.2.1 *"Handle a CPM Session Invitation"* and sect. 8.2.2.7.1. *"Re-join handling"*, with the exception of the Request-URI header field which MAY be set to a different CPM Controlling Function than the one that has handled the original CPM Group Session, subject to service provider policies;

2) If the CPM Client is not allowed to re-start the CPM Long-lived Group Session, the CPM Participating Function SHALL reject the re-INVITE with a SIP 403 "Forbidden" error code (e.g. if the CPM Controlling Function used by the CPM Client in the request is not allowed for re-starting CPM Long-lived Group Sessions, etc).

If the CPM Group Session is active, then:

1) If the CPM Participating Function remained in the media path and is already connected in the active CPM Group Session on behalf of the CPM User, then the CPM Participating Function SHALL re-connect the CPM Client into the on-going session and continue to have the role of a B2BUA. If the deferring of the missed CPM Group Session messages and disposition notifications is enabled for the CPM User, then the CPM Participating Function SHALL perform the deferred delivery of the CPM Group Session within this session, as described inSection 8.3.2.9 "Deferred CPM Group Session Handling".

2) If the CPM Participating Function did not remain in the media path of the CPM Group Session, then it SHALL handle the request as described in sect. 8.2.2.1 *"Handle a CPM Session Invitation"*.

8.2.2.8 Handling of Failed Deferred Delivery of Chat Messages

The CPM Participating Function in the originating network MAY retry delivery of failed CPM Chat Messages to the recipient(s), subject to service provider policies.

8.2.3 CPM File Transfer Handling

8.2.3.1 Handle a CPM File Transfer

The CPM Participating Function SHALL handle a CPM File Transfer initiation request (i.e. a SIP INVITE request that includes the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.filetransfer' in the Accept-Contact header field) in exactly the same manner as described for CPM Session Invitations in section 8.2.2.1 *"Handle a CPM Session Invitation"* , with the following additional procedures before the CPM Participating Function decides to stay in the media path:

- The CPM Participating Function SHALL check if there is a rule in [OMA-XDM-Policy] in which the "enabler" attribute of the '<service>' sub-element inside the '<service-list>' element of the conditions part of the rule is set to "CPM" and the '<action>' element of the rule contains a '<max-file-transfer-size>' sub-element.

- If the <max-file-transfer-size> does not exist, or exists but has a value of zero, proceed with the remaining steps in section 8.2.2.1 *"Handle a CPM Session Invitation*;

- Otherwise, if the <max-file-transfer-size> exists, and is non-zero, and the "file-selector:size" attribute in the SDP exceeds that value, the CPM Participating function SHALL enforce the policy by returning a SIP 403 "Forbidden" response and SHALL include a Warning header field with the warning text set to "133 Size exceeded" in the response according to the rules and procedures of [RFC3261].

The CPM Participating Function SHALL handle the request with the following differences from the procedures in section 8.2.2.1 "*Handle a CPM Session Invitation*":

a. SHALL copy the Contact header and the Accept-Contact header field of the incoming SIP INVITE request to the outgoing SIP INVITE request, percent encoded as per [3GPP TS 24.229] section 7.2A.8.2 "*Coding of the ICSI*";

b. SHALL check if in the received SIP INVITE:

i. the P-Preferred-Service header field is present and carries the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm. filetransfer'. In this case, the CPM Participating Function SHALL remove the P-Preferred-Service header field and add P-Asserted-Service header field and set it to 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm. filetransfer'; or

ii. the P-Asserted-Service header field is present and carries the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm. filetransfer'. If another value is found, the CPM Participating Function MAY reject the SIP INVITE with a SIP 403 "Forbidden" response;

With respect to the SDP contents of outgoing SIP INVITE requests, the CPM Participating Function SHALL follow the rules and procedures of [RFC5547].

8.2.3.2 Handle a CPM File Transfer Closing Request

The CPM Participating Function SHALL handle the closing of a CPM File Transfer session in exactly the same manner as defined for CPM Sessions in section 8.2.2.3 "*Handle a SIP BYE Request*" with the following clarifications.

1. if the action element <allow-offline-storage> is set to true for the originating CPM User:

a. If the CPM File Transfer is not initiated in a CPM Session, the CPM Participating Function SHALL store the File Transfer history object as specified in section 8.5.3 "Recording CPM File Transfer"

b. If the CPM File Transfer is initiated in a CPM Session, the CPM Participating Function SHALL store the File Transfer History Object in the CPM Session history folder associated with the CPM Session as specified in section 8.5.3 "Recording CPM File Transfer", if a corresponding CPM Session history folder exists. If not, the CPM Participating Function SHALL create one with a new session info object in the CPM Session history folder.

c. SHALL include in the SIP 200 "OK" response a Message-UID header field set to the UID of the session info object of the associated CPM Session, to the served CPM Client.

2. Otherwise, it SHALL return SIP 200 "OK" response without a Message-UID header field.

8.2.3.3 Handling of Failed Deferred Delivery of File Transfers

The CPM Participating Function in the originating network MAY retry delivery of failed CPM File Transfer files to a recipient, subject to service provider policies.

8.2.4 Receiving a Disposition Notification

When receiving a SIP MESSAGE request containing a delivery notification or a read report, the CPM Participating Function MAY either forward the SIP MESSAGE directly to the original sender of the CPM Message, according to the rules and procedures of the SIP/IP core, or it MAY continue with the storing procedures, subject to Service Provider policy.

If the received disposition notification needs to be forwarded to the CPM Client, the CPM Participating Function:

1. SHALL extract the <message-id> and disposition type from the IMDN in the SIP MESSAGE request;

2. If there are cached message-ids, it SHALL check whether the extracted message-id is the same as one of the cached message-ids:

      a. If the value is the same, the CPM Participating Function SHALL check whether the extracted disposition type is the same as the cached disposition type:

          i. If a disposition of the same type was already sent, the CPM Participating Function SHALL NOT forward the SIP MESSAGE request towards the original sender of the CPM Message;

          ii. Otherwise, the CPM Participating Function SHALL cache the message-id and the disposition type and SHALL forward SIP MESSAGE request to the original sender of the CPM Message according to the rules and procedures of the SIP/IP core.

      b. Otherwise, the CPM Participating Function SHALL cache the extracted message-id and the disposition type and SHALL forward the SIP MESSAGE request to the original sender of the CPM Message according to the rules and procedures of the SIP/IP core;

NOTE: How long message-ids are cached is dependent on service provider policy.

3. If there are no cached message-ids, the CPM Participating Function SHALL cache the extracted message-id and the disposition type and SHALL forward SIP MESSAGE request to the original sender of the CPM Message according to the rules and procedures of the SIP/IP core.

If the receiving CPM Client is not available, the CPM Participating Function SHALL proceed with deferring the disposition notification, following procedures described in sect. 8.3.1.6 "Defer Standalone CPM Messages".

If the received disposition notification needs to be stored, the CPM Participating Function SHALL store the disposition notification in the appropriate Conversation History, based on the Conversation-ID.

8.2.5 Sending a Disposition Notification

A CPM Participating Function on the originating network side SHALL send IMDN notifications following the procedures described in Section 8.3.4 "Sending a Disposition Notification", when requested by the sender as described in [RFC5438].

8.3 Procedures in the Terminating Network

A CPM Participating Function in a terminating network handles incoming CPM communications in the following manners:

- Upon receiving a SIP MESSAGE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.msg' defined in Appendix H included in the Accept-Contact header, the CPM Participating Function SHALL handle this SIP MESSAGE request as described in section 8.3.1.1 "*Handle a Pager Mode CPM Standalone Message*".

- Upon receiving a SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.largemsg' defined in Appendix H included in the Accept-Contact header, the CPM Participating Function SHALL handle this SIP INVITE request as described in section 8.3.1.2 " *Handle a Large Message Mode* ",

- Upon receiving a SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred' defined in Appendix H included in the Accept-Contact header, the CPM Participating Function SHALL handle this SIP INVITE request as described in section 8.3.1.5.3 "*Sending Notifications and Awaiting CPM Client Action*",

- Upon receiving a SIP SUBSCRIBE request with the Event header set to 'deferred-messages', the CPM Participating Function SHALL handle this SIP SUBSCRIBE request as described in section 8 "*When receiving a SIP ACK request, the CPM* Participating Function SHALL ignore this request.

   1. When receiving a SIP BYE request, the CPM Participating Function SHALL process this according to the rules and procedures of [RFC3261].

      NOTE 2: such a SIP ACK or SIP BYE request can arrive at any time after step 2, but must not affect execution of the following steps.

   2. If the CPM Participating Function receives another SIP INVITE request from a different client of the same CPM User addressed to the same CPMDeferredMsgMgmtURI and with the same feature tag as indicated above, the CPM Participating Function SHALL handle such overlapping SIP INVITE requests in a first come first served manner.

- Delivering Deferred CPM Messages to the Message Storage Server",

- Upon receiving a SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' defined in Appendix H included in the Accept-Contact header, the CPM Participating Function SHALL handle this SIP INVITE request as described in section 8.3.2.1 "*Handle a CPM Session Invitation*",

- Upon receiving a SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.filetransfer' defined in Appendix H included in the Accept-Contact header, the CPM Participating Function SHALL handle this SIP INVITE request as described in section 8.3.3.1 "*Handle a CPM File Transfer Initiation*",

8.3.1   CPM Message Handling

8.3.1.1   Handle a Pager Mode CPM Standalone Message

Upon receiving a SIP MESSAGE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.msg' included in the Accept-Contact header, the CPM Participating Function SHALL execute the following:

1. If the CPM Participating Function requires a specific User Agent version to be supported, the CPM Participating Function SHALL check the "User Agent" header field to determine if the CPM Participating Function supports the User Agent version and if not, the CPM Participating Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "132 Version not supported" in the response according to the rules and procedures of [RFC3261].

   Otherwise, continue with rest of the steps;

2. If the CPM Participating Function does not allow anonymity and anonymity is requested, the CPM Participating Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "119 Anonymity not allowed" in the response according to the rules and procedures of [RFC3261].

   Otherwise, continue with the rest of the steps;

3. Check if the Authenticated Originator CPM Address of the SIP MESSAGE request is included in the standalone messages Blacklist URI-list stored in [OMA-XDM-List]. If it is, then the CPM Participating Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "122 Function not allowed" according to the rules and procedures of [RFC3261].

   Otherwise, continue with the rest of the steps;

4. Check in the recipient's user preferences retrieved from XDMS as described in 8.4.1 "*Retrieving User Preferences*" and if there is a rule in [OMA-XDM-Policy in which the "enabler" attribute of the '<service>' sub-element inside the '<service-list>' element of the conditions part of the rule is set to "CPM" and the '<media-list>' element of the conditions part of the rule contains the '<standalone-message>' element. If such a rule exists then the CPM Participating Function SHALL handle the value of the '<action>' element as follows:

   a. If the action element includes an '<allow-reject-invite>' sub-element set to "true", the CPM Participating Function SHALL return a SIP 403 "Forbidden" response to the CPM Client. Also the CPM Participating Function SHALL include a Warning header with the warning text set to "122 Function not allowed" according to the rules and procedures of [RFC3261].

      Otherwise, continue with the rest of the steps;

   b. If the action element includes an '<allow-interwork>' sub-element set to "true" or if the action element includes an '<allow-delivery-and-interwork>' sub-element set to "true", the CPM Participating Function SHALL send the SIP MESSAGE directly to the ISF without as described in section 6.5 "*Communicating with the ISF*".

   c. If the action element includes an '<allow-store>' sub-element set to "true", the CPM Participating Function:

      i. SHALL remove the Disposition-Notification header field in CPIM header of the received CPM Standalone Message as defined in [RFC5438];
         NOTE: If present, the request for read report is not removed by the CPM Participating Function.

ii. SHALL store the message in the user's message store in the Message Storage Server according to procedures specified in section 6.3.1 "*Object Store Operation*" of [OMA-CPM_TS_MessageStorage].

iii. If the originator of the CPM Standalone Message requested a "positive-delivery" disposition notification as defined in [RFC5438], SHALL generate a "positive-delivery" notification as described in section **Error! Reference source not found.** "*Error! Reference source not found.*";

iv. SHALL return a SIP 200 "OK" response.

Otherwise, continue with the rest of the steps;

d. If the action element includes an '<allow-forward>' sub-element set to "true", the CPM Participating Function SHALL change the address of the recipient to the one provided in the user preferences and send the CPM Standalone Message to that address through the SIP/IP core.

Otherwise, continue with the rest of the steps;

e. If the action element includes an '<allow-defer>' sub-element set to "true", the CPM Participating Function SHALL defer the message as specified in section 8.3.1.5 "*Defer CPM Standalone* Messages" and SHALL return a SIP 202 "Accepted" response;

Otherwise, continue with the rest of the steps;

5. If in step 4 no rule matched or if the action element of the matching rule included an '<allow-deliver-and-interwork>' sub-element set to "true", the CPM Participating Function SHALL check if there is a rule in [OMA-XDM-Policy] in which the "enabler" attribute of the '<service>' sub-element inside the '<service-list>' element of the conditions part of the rule is set to "CPM" and the '<action>' element of the rule contains an '<allow-do-not-disturb>' sub-element set to "true". If such a rule exists then the CPM Participating Function SHALL defer the message as specified in section 8.3.1.5 "*Defer CPM Standalone Messages*" and SHALL return a SIP 202 "Accepted" response.

6. If in step 4 no rule matched or if the action element of the matching rule included an '<allow-deliver-and-interwork>' sub-element set to "true" or an '<allow-interworking>' sub-element set to "true", the CPM Participating Function SHALL if there is a rule in [OMA-XDM-Policy] in which the "enabler" attribute of the '<service>' sub-element inside the '<service-list>' element of the conditions part of the rule is set to "CPM" and the '<action>' element of the rule contains an '<allow-offline-storage>' sub-element set to "true". If such a rule exists, it SHALL execute the processing described in section 8.5 "*Record CPM Conversation History*".

7. If in step 4 no rule matched or if the action element of the matching rule included the '<allow-deliver-and-interwork>' sub-element, the CPM Participating Function SHALL:

a. Determine which of the registered CPM Clients are expected to receive the CPM Standalone Message as follows:

i. SHALL check for rules in [OMA-XDM-Policy] satisfying the following criteria:

- The <service-list> element inside the <conditions> element contains a <service> element with the attribute "enabler" set to "CPM".

- The <upp-list> element inside the <conditions> element contains the active User Preference Profile name of one of the registered CPM Clients of the recipient CPM User.

- Other elements inside the <conditions> element evaluate to true for the CPM Standalone Message.

- The <action> element contains a <allow-reject-invite> element, as defined in [OMA-XDM-Policy], and with its value set to "true".

ii. SHALL exclude each registered CPM Client whose active User Preference Profile is mentioned in one of the rules found as a result of step i from the list of registered CPM Clients that will receive the CPM Standalone Message;

iii. MAY evaluate other information sources to determine device connectivity and, if evaluated, SHALL exclude those registered CPM Clients whose connectivity does not allow to receive the CPM Standalone Message.

iv.   SHALL further exclude those registered CPM Clients whose capabilities (learnt via the registration NOTIFY request as specified in section 8.1.4 "*Using the Registration Event Information*", or via other information sources) do not allow to receive the CPM Standalone Message.

v.   SHALL further exclude those registered CPM Clients that should not receive the CPM Standalone Message according to service provider policies.

NOTE: steps ii, iii, iv, and v implement the notion of a CPM Client being "suitable" (or not) for a request as described in Section 5.2.2.1.3 of [OMA-CPM-SD]. This notion of "suitable" applies equally to other requests, i.e. Large Mode CPM Standalone Message request, CPM Session Invitation request and CPM File Transfer request, see affected sections.

b.   MAY replace each Media Object attached to the CPM Standalone Message with a reference, as described in section 8.3.1.3 "*Replacing Media with a Reference*"

c.   SHALL generate a SIP MESSAGE request for each registered CPM Client selected in step a according to the rules and procedures of [RFC3428];

d.   SHALL copy the Accept-Contact header(s) of the incoming SIP MESSAGE request to the outgoing SIP MESSAGE request (including the Accept-Contact header with the sip.instance tag and value for the device identifier, if one was provided);

e.   SHALL check if in the received SIP MESSAGE:

i.   the P-Preferred-Service header field is present and carries the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.msg'. In this case, the CPM Participating Function SHALL remove the P-Preferred-Service header field and add P-Asserted-Service header field and set it to 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.msg'; or

ii.   if P-Asserted-Service header field is present and carries the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.msg'. If another value is found, the CPM Participating Function MAY reject the SIP INVITE with a SIP 403 "Forbidden" response;

f.   SHALL include a Request-URI and set its value to the suitable CPM Client's identity, which is one of the public GRUU if one was provided, or recipient CPM User's Address obtained in the registration NOTIFY request as specified in the subsection 8.1.2 "*Receive Registration Event Information Notifications*";

g.   SHALL include the CPM release version in the User-Agent header field as specified in Appendix D "Release Version in User-agent and Server headers";

h.   If the CPM Standalone Message was recorded in step 6, the CPM Participating Function SHALL include the UID information retrieved in section 8.5 "Record CPM Conversation History" in the Message-UID header as specified in Appendix C.1.6 "Message-UID";

i.   SHALL send the request via the SIP/IP core towards each user's selected CPM Client.

If in step 7 no suitable registered CPM Clients are found to receive the request, then the CPM Participating Function SHALL defer the message as specified in section 8.3.1.5 "*Defer CPM Standalone Messages*" and SHALL return a SIP 202 "Accepted" response.

With the exception of message forwarded case upon receiving the first SIP 2xx final response from one of the selected CPM Clients, the CPM Participating Function SHALL send the SIP final response along the signalling path towards the originating CPM Client according to the rules and procedures of [RFC3261];

If none of the suitable CPM Clients, nor, if applicable, the ISF return a SIP 200 "OK" response, the CPM Participating Function SHALL check the service provider policy about handling undelivered messages. If the service provider policy is:

1.   To defer the message then the CPM Participating Function SHALL defer the message as specified in section 8.3.1.5 "*Defer CPM Standalone Messages*" and SHALL return a SIP 202 "Accepted" response;

2.   To deliver the message using a Non-CPM Communication Service, the CPM Participating Function SHALL send the SIP MESSAGE directly to the ISF as described in section 6.5 "*Communicating with the ISF*.

If the CPM Standalone Message was recorded but could not be delivered to any CPM Client nor could be interworked, the CPM Participating Function SHALL delete that CPM Standalone Message as described in section 6.3.5 "*Object Remove Operation*" in [OMA-CPM_TS_MessageStorage].

8.3.1.2   Handle a Large Message Mode CPM Standalone Message

Upon receiving a SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.largemsg' included in the Accept-Contact header corresponding to Large Message Mode CPM Standalone Message, the CPM Participating Function SHALL execute the following:

1. If the CPM Participating Function requires a specific User Agent version to be supported, the CPM Participating Function SHALL check the "User Agent" header field to determine if the CPM Participating Function supports the User Agent version and if not, the CPM Participating Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "132 Version not supported" in the response according to the rules and procedures of [RFC3261].

    Otherwise, continue with rest of the steps;

2. If the CPM Participating Function does not allow anonymity and anonymity is requested, the CPM Participating Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "119 Anonymity not allowed" in the response according to the rules and procedures of [RFC3261].

    Otherwise, continue with the rest of the steps;

3. If the "Session-Expires" header is included, the CPM Participating Function SHOULD handle the header according to procedures of [RFC4028].

4. SHALL behave as a B2BUA according to the rules and procedures of [RFC3261] for the duration of the session;

5. Check if the Authenticated Originator CPM Address of the SIP INVITE request is included in the standalone message Blacklist URI-list stored in [OMA-XDM-List]. If it is, then the CPM Participating Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "122 Function not allowed" according to the rules and procedures of [RFC3261].

    Otherwise, continue with the rest of the steps;

6. Check in the recipient's user preferences retrieved from XDMS as described in 8.4.1 "*Retrieving User Preferences*" and if there is a rule in [OMA-XDM-Policy] in which the "enabler" attribute of the '<service>' sub-element inside the '<service-list>' element of the conditions part of the rule is set to "CPM" and the '<media-list>' element of the conditions part of the rule contains the '<standalone-message>' element. If such a rule exists then the CPM Participating Function SHALL handle the value of the '<action>' element as follows:

    a. If the action element includes an '<allow-reject-invite>' sub-element set to "true", the CPM Participating Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "122 Function not allowed" in the response according to the rules and procedures of [RFC3261].

        Otherwise, continue with the rest of the steps;

    b. If the action element includes an '<allow-interwork>' sub-element set to "true" or if the action element includes an '<allow-deliver-and-interwork>' sub-element set to "true", the CPM Participating Function:

        i.   SHALL generate a SIP INVITE request for the ISF according to the rules and procedures of [RFC3261];

        ii. SHALL copy the Contact header and Accept-Contact header of the incoming SIP INVITE request to the outgoing SIP INVITE request;

        iii. SHALL check if in the received SIP INVITE:

            1. the P-Preferred-Service header field is present and carries the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.largemsg', or

            2. if P-Asserted-Service header field is present and carries the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.largemsg'.

If another value is found in either of the two header fields, the CPM Participating Function MAY reject the SIP INVITE with a SIP 403 "Forbidden" response;

    iv.   SHALL insert a URI identifying its own address in the Contact header;

    v.   SHALL include a User-Agent header to indicate the OMA CPM release version of the Participating Function as specified in Appendix D "*Release Version in User-agent and Server headers*";

    vi.   SHALL include the MIME SDP body received in the SIP INVITE request as a SDP offer according to the rules and procedures of [RFC3264], [RFC4566], [RFC4975], [RFC6135] and [draft-ietf-simple-msrp-sessmatch] with the following clarification, the CPM Participating Function:

        1.   SHALL include media line proposing MSRP media parameters;

        2.   SHALL prepend its own MSRP URI for the MSRP connection setup as a=path:MSRP URI.

        3.   SHALL set the SDP directional media attribute to a=sendonly;

        4.   SHALL set the size as a=file-selector:size:actual message size;

        5.   SHALL set the a=setup attribute as "active" since interworking with a Non-CPM Communication Service has been chosen.

    vii.   SHALL send the SIP INVITE request directly to the ISF as described in section 6.5 "*Communicating with the ISF*".

  c.   If the action element includes an '<allow-store>' sub-element set to "true", the CPM Participating Function:

    i.   SHALL establish an MSRP session to receive the message as described in 8.3.1.4 "*Establish MSRP Session for Receiving Large Message* Mode ";

    ii.   SHALL remove the Disposition-Notification Header Field in CPIM header of the received CPM Standalone Message as defined in [RFC5438];

       NOTE: If present, the request for read report is not removed by the CPM Participating Function.

    iii.   SHALL store the message in the Message Storage Server according to procedures specified in section 6.3.1 "*Object Store Operation*" of [OMA-CPM_TS_MessageStorage] and obtain an UID from the Message Storage Server.

    iv.   If the originator of the CPM Standalone Message requested a "positive-delivery" disposition notification as defined in [RFC5438], SHALL generate a "positive-delivery" notification as described in section **Error! Reference source not found.** "*Error! Reference source not found.*".

Otherwise, continue with the rest of the steps;

  d.   If the action element includes an '<allow-forward>' sub-element set to "true", the CPM Participating Function SHALL change the address of the recipient to the one provided in the user preferences and send the INVITE to that address through the SIP/IP core.

Otherwise, continue with the rest of the steps;

  e.   If the action element includes an '<allow-defer>' sub-element set to "true", the CPM Participating Function:

    i.   SHALL establish an MSRP session to receive the message as described in section 8.3.1.4 "*Establish MSRP Session for Receiving Large Message* Mode ";

    ii.   SHALL defer the message as described in section 8.3.1.5 "*Defer CPM Standalone* Messages".

Otherwise, continue with the rest of the steps;

7.   If in step 6 no rule matched or if the action element of the matching rule included an '<allow-deliver-and-interwork>' sub-element set to "true", the CPM Participating Function SHALL check if there is a rule in [OMA-

XDM-Policy] in which the "enabler" attribute of the '<service>' sub-element inside the '<service-list>' element of the conditions part of the rule is set to "CPM" and the '<action>' element of the rule contains an '<allow-do-not-disturb>' sub-element set to "true". If such a rule exists then the CPM Participating Function SHALL establish an MSRP session to receive the message as described in section 8.3.1.4 "*Establish MSRP Session for Receiving Large Message Mode* " and SHALL defer the message as specified in section 8.3.1.5 "*Defer CPM Standalone Messages*".

Otherwise, continue with the rest of the steps;

8. If in step 6 no rule matched or if the action element of the matching rule included an '<allow-deliver-and-interwork>' sub-element set to "true", the CPM Participating Function SHALL:

    a. Determine which of the registered CPM Clients are expected to receive the CPM Standalone Message by evaluating which CPM Clients are suitable, as described in the note of step 7 of section 8.3.1.1 "*Handle a Pager Mode CPM Standalone Message*"

    b. SHALL generate a SIP INVITE request for each selected CPM Client according to the rules and procedures of [RFC3261];

    c. SHALL copy the Contact header and Accept-Contact header of the incoming SIP INVITE request to the outgoing SIP INVITE request;

    d. SHALL insert a URI identifying its own address in the Contact header;

    e. SHALL include a Request-URI header and set its value to the suitable CPM Client's identity, which is one of, public GRUU or the recipient CPM User's Address obtained in the registration NOTIFY request as specified in the subsection 8.1.2 "*Receive Registration Event Information Notifications*"; or

    f. SHALL include the CPM release version in the User-Agent header as specified in Appendix D "*Release Version in User-agent and Server headers*";

    g. SHALL include the MIME SDP body received in the SIP INVITE request as a SDP offer according to the rules and procedures of [RFC3264], [RFC4566], [RFC4975], [RFC6135] and [draft-ietf-simple-msrp-sessmatch] with the following clarification, the CPM Participating Function:

        i.   SHALL include media line proposing MSRP media parameters;

        ii. SHALL prepend its own MSRP URI for the MSRP connection setup as a=path:MSRP URI.

        iii. SHALL set the SDP directional media attribute to a=sendonly.

        iv. SHALL set the size as a=file-selector:size:actual message size;

        v.   SHALL set the a=setup attribute as "passive".

    h. SHALL send the request via the SIP/IP core towards each selected CPM Client.

If no suitable registered CPM Clients are found to receive the request, then the CPM Participating Function SHALL establish an MSRP Session to receive the message as described in 8.3.1.4 "*Establish MSRP Session for Receiving Large Message Mode* " and SHALL defer the message as specified in section 8.3.1.5 "*Defer CPM Standalone Messages*" and stop with this procedure.

Upon receiving the first SIP 200 "OK" response returned from the SIP INVITE requests delivered to the CPM Clients and/or ISF, the CPM Participating Function SHALL establish an MSRP session to receive the message as described in 8.3.1.4 "*Establish MSRP Session for Receiving Large Message Mode CPM Standalone Message*".

If the recipient's user preferences retrieved from XDMS as described in section 8.4.1 "*Retrieving User Preferences*" contain a rule in [OMA-XDM-Policy] in which the "enabler" attribute of the '<service>' sub-element inside the '<service-list>' element of the conditions part of the rule is set to "CPM" and the '<action>' element of the rule contains an '<allow-offline-storage>' sub-element set to "true", the CPM Participating Function SHALL execute the processing described in section 8.5 "*Record CPM Conversation History*".

Upon receiving a SIP 200 "OK" response from a CPM Client or from the ISF, the CPM Participating Function:

1. SHALL send a SIP ACK request to the sender of the SIP 200 "OK" response according to the rules and procedures of the [RFC3261].

2. SHALL follow the actions according to the rules and procedures of [RFC3261], [RFC4975], [RFC6135] and [draft-ietf-simple-msrp-sessmatch] to set up an MSRP session with the sender of the SIP 200 "OK" response;

3. SHALL send one or more MSRP SEND request(s) according to rules and procedures of [RFC4975] to transfer the Large Message Mode CPM Standalone Message;

4. SHALL generate a SIP BYE request and, if user preference was set to store the CPM Conversation History, the CPM Participating Function SHALL include the Message-UID header set to the retrieved UID information as defined in Appendix C "*CPM-defined SIP Header* fields".

5. SHALL send a SIP BYE request towards the sender of the SIP 200 "OK" response according to the rules and procedures of the[RFC3261];

6. SHALL release the resources related to the recipient after the delivery.

NOTE: These steps will be performed for each SIP 200 "OK" received by the CPM Participating Function.

If none of the CPM Clients, nor, if applicable, the ISF return a SIP 200 "OK" response, or if an MSRP SEND error response is received from all selected CPM Clients and, if applicable, from the ISF (i.e. if the message was not delivered anywhere), the CPM Participating Function SHALL check the service provider policy about handling undelivered messages. If the service provider policy is:

1. To defer the message, the CPM Participating Function:

    a. SHALL, if not already done, establish an MSRP session to receive the message as described in 8.3.1.4 "*Establish MSRP Session for Receiving Large Message Mode* ";

    b. SHALL defer the message as described in 8.3.1.5 "*Defer CPM Standalone Messages*";

    c. If the CPM Standalone Message was recorded, the CPM Participating Function SHALL delete the stored CPM Standalone Message by UID as described in section 6.3.5 "*Object Remove Operation*" in [OMA-CPM_TS_MessageStorage].

2. To deliver the message using a Non-CPM Communication Service, if <allow-interwork> or <allow-deliver-and-interwork> had not already been selected, the CPM Participating Function:

    a. SHALL generate a SIP INVITE request for the ISF according to the rules and procedures of [RFC3261];

    b. SHALL copy the Contact header and Accept-Contact header of the incoming SIP INVITE request to the outgoing SIP INVITE request;

    c. SHALL insert a URI identifying its own address in the Contact header;

    d. SHALL include a User-Agent header to indicate the OMA CPM release version of the Participating Function as specified in Appendix D "*Release Version in User-agent and Server headers*";

    e. SHALL include the MIME SDP body received in the SIP INVITE request as a SDP offer according to the rules and procedures of [RFC3264], [RFC4566], [RFC4975], [RFC6135] and [draft-ietf-simple-msrp-sessmatch] with the following clarification, the CPM Participating Function:

        i. SHALL include media line proposing MSRP media parameters;

        ii. SHALL prepend its own MSRP URI for the MSRP connection setup as a=path:MSRP URI;

        iii. SHALL set the SDP directional media attribute to a=sendonly;

        iv. SHALL set the size as a=file-selector:size:actual message size;

        v. SHALL set the a=setup attribute as "active" since interworking with a Non-CPM Communication Service has been chosen;

    f. SHALL send the SIP INVITE request directly to the ISF as described in section 6.5 "*Communicating with the ISF*".

3. To send back the error response if deferring is not an option and interworking had already been selected but returned an error response, then the CPM Participating Function SHALL send back the SIP error response or MSRP SEND error response to the sender of the CPM Standalone Message.

8.3.1.3 Replacing Media with a Reference

The CPM Participating Function SHALL replace all Media Objects attached to a CPM Standalone Message with a reference if there exists a rule in [OMA-XDM-Policy] satisfying the following criteria:

1. The <service-list> element inside the <conditions> element contains a <service> element with the attribute "enabler" set to "CPM";

2. The <action> element contains a <allow-deliver-reference-media> element, as defined in [OMA-XDM-Policy], and with its value set to "true".

If such a rule is found, the CPM Participating Function:

1. SHALL store the CPM Standalone Message to the Message Storage Server according to procedures specified in section 6.3.1 "*Object Store Operation*" of [OMA-CPM_TS_MessageStorage] and obtain an UID from the Message Storage Server;

2. SHALL fetch the body structure for the stored CPM Standalone Message corresponding to the UID from the Message Storage Server according to procedures of [RFC3501];

3. SHALL generate IMAP URL for each Media Object decided to be replaced according to procedures of [RFC5092];

Once references to each Media Object are obtained, the CPM Participating Function

1. SHALL remove the Media Objects to be replaced from the received CPM Standalone Message as indicated in the active User Preference Profile;

2. SHALL include the IMAP URL in the body of the CPM Standalone Message corresponding to each Media Object to be replaced according to procedures of [RFC4483].

NOTE: If there are other Content-Type headers within the CPM Standalone Message, the CPM Participating Function keeps the Content-Type header "multipart/mixed" with the proper boundary value to distinguish the URL part and existing parts as described in [RFC2046].

8.3.1.4 Establish MSRP Session for Receiving Large Message Mode CPM Standalone Message

To establish an MSRP session, the CPM Participating Function:

1. SHALL generate a SIP 200 "OK" response according to the rules and procedures of [RFC3261];

2. SHALL include the SDP received in the response of SIP INVITE request as answer SDP according to the rules and procedures of [RFC3264], [RFC4566], [RFC4975], [RFC6135] and [draft-ietf-simple-msrp-sessmatch] with the following clarification, CPM Participating Function:

    a. SHALL include media line proposing MSRP media parameters;

    b. SHALL include its own MSRP URI for the MSRP connection setup as a=path:MSRP URI;

    c. SHALL set the SDP directional media attribute to a=recvonly;

    d. SHALL set the a=setup attribute as "passive".

3. SHALL include a Server header to indicate the OMA CPM release version of the CPM Participating Function as specified in Appendix D "*Release Version in User-agent and Server headers*";

4. SHALL include a URI identifying its own address in the Contact header;

5. SHALL send the SIP 200 "OK" response according to procedures of SIP/IP core;

Upon receiving a SIP CANCEL request, the CPM Participating Function SHALL act as a UAS to handle the SIP CANCEL request according to the rules and procedures of [RFC3261].

Upon receiving a SIP ACK request, the CPM Participating Function SHALL act as a "passive" endpoint according to [RFC6135] to establish an MSRP connection according to [RFC4975].

Upon receiving an MSRP SEND request, the CPM Participating Function:

1. SHALL wait until all chunks of the message have been received via subsequent MSRP SEND requests and SHALL reassemble the message from these chunks;

2. SHALL generate and send one or more MSRP 200 "OK" responses, one per MSRP SEND request received according to the rules and procedures of [RFC4975].

Upon receiving a SIP BYE request from the originating CPM User, CPM Participating Function SHALL respond to the SIP BYE request as described in [RFC3261].

8.3.1.5 Defer CPM Standalone Messages

Each time the CPM Participating Function receives a message that is to be deferred on behalf of the served CPM User, the CPM Participating Function SHALL check if there is a rule in [OMA-XDM-Policy] in which the "enabler" attribute of the '<service>' sub-element inside the '<service-list>' element of the conditions part of the rule is set to "CPM" and the '<media-list>' element of the conditions part of the rule contains an '<deferred-messages>' element. If such a rule exists then the CPM Participating Function SHALL check the value of the '<action>' element of that rule as follows:

1. If the '<action>' element includes an '<allow-push>' sub-element set to "true", the CPM Participating Function SHALL store the Deferred CPM Message in the Deferred CPM Message queue as described in section 8.3.1.5.1 "*Storing a Deferred CPM Message in the Deferred CPM Message Queue*" and SHALL handle the Deferred CPM Messages as described in section 8.3.1.5.2 "*Pushing Deferred CPM Messages*".

2. If the '<action>' element includes an '<allow-pull>' sub-element set to "true", the CPM Participating Function store the Deferred CPM Message in the Deferred CPM Message queue as described in section 8.3.1.5.1 "*Storing a Deferred CPM Message in the Deferred CPM Message Queue*" and SHALL handle the Deferred CPM Messages as described in section 8.3.1.5.3 "*Sending Notifications and Awaiting CPM Client Action*".

3. If the '<action>'element includes an '<allow-store>' sub-element set to "true", the CPM Participating Function SHALL handle the Deferred CPM Messages as described in section 10 "*When receiving a SIP ACK request, the CPM Participating Function SHALL ignore this request.*

3. When receiving a SIP BYE request, the CPM Participating Function SHALL process this according to the rules and procedures of [RFC3261].

   NOTE 2: such a SIP ACK or SIP BYE request can arrive at any time after step 2, but must not affect execution of the following steps.

4. If the CPM Participating Function receives another SIP INVITE request from a different client of the same CPM User addressed to the same CPMDeferredMsgMgmtURI and with the same feature tag as indicated above, the CPM Participating Function SHALL handle such overlapping SIP INVITE requests in a first come first served manner.

4. Delivering Deferred CPM Messages to the Message Storage Server".

NOTE: The behaviour of the CPM Participating Function when none of the three options above have been enabled is implementation specific.

8.3.1.5.1 Storing a Deferred CPM Message in the Deferred CPM Message Queue

For each CPM Standalone Message that needs to be stored in the Deferred CPM Message queue, the CPM Participating Function:

1. SHALL, in case of a Pager Mode CPM Standalone Message, store the following information:

   a. The SIP MESSAGE request start-line, as well the following headers of SIP MESSAGE request:

      - From

      - To

      - P-Asserted-Identity, if there is and only if the sending User did not request anonymity

      - Subject (if present)

      - Date (added with current date and time if not present)

- Accept-Contact

- P-Asserted-Service or P-Preferred-Service, whichever is received

- Content-Type (set to Content-Type of the SIP MESSAGE request message body, or to multipart/mixed if there is a recipient-uri-list as well as SIP MESSAGE request message body)

- Content-Length:<messagesize>

- Conversation-ID

- Contribution-ID

- InReplyTo-Contribution-ID (if present)

   NOTE: Some of the header fields shall not be stored, in particular header fields related to charging that are expected to be removed by the network.

   b.   All CPIM headers relevant for IMDN

   c.   body part consisting of all the recipients carried in recipient-uri-list body of the SIP MESSAGE request if present

   d.   The complete message body or bodies of the SIP MESSAGE request;

2.   SHALL, in the case of Large Message Mode CPM Standalone Message, store the following information:

   a.   The SIP INVITE request start-line, as well as the following headers of SIP INVITE request of the Deferred CPM Message:

- From

- To

- P-Asserted-Identity, if there is and only if the sending User did not request anonymity

- Subject (if present)

- Date (added with current date and time if not present)

- Accept-Contact

- Contact

- P-Asserted-Service or P-Preferred-Service, whichever is rceived

- Referred-By if present

- Content-Type (set to Content-Type of the MSRP SEND, or to multipart/mixed if there is a recipient-uri-list as well as an MSRP SEND message)

- Content-Length

- Conversation-ID

- Contribution-ID

- InReplyTo-Contribution-ID (if present)

   b.   body part consisting of all the recipients carried in recipient-uri-list body of the SIP INVITE request if present

   c.   The MSRP request start-line, as well as the relevant headers of the MSRP SEND request:

- Message-ID,

- Success-Report and Failure-Report if present, and

- Content-Type

- Byte-Range: 1-*/<messagesize>.

- Content-Disposition

- The complete message body. If the message arrives in more than one MSRP SEND request since it had been sent in chunks as defined in [RFC4975], then the CPM Participating Function shall assemble the message and store it as one message.

3. SHALL assign a unique message-URI-ID for each Deferred CPM Message whose general format is messageURI-ID ="sip:String@hostname" with the following clarification:

   a. The CPM Participating Function generates the unique string by itself

4. SHALL store the Deferred CPM Message in the Deferred CPM Message queue;

5. SHALL associate an expiry time value with the Deferred CPM Message:

   a. In case of a Pager Mode CPM Standalone Message,

      - If the SIP MESSAGE request contains an Expires header as defined in Appendix C "*CPM-defined SIP Header* fields" [RFC3428], and the value is below the maximum expiry time value per service provider policy, the CPM Participating Function SHALL set the expiry time value to the value contained in the SIP MESSAGE request Expires header field; otherwise the CPM Participating Function SHALL set the expiry time value to the maximum expiry time value per service provider policy.

   b. In case of a Large Message Mode CPM Standalone Message,

      - If the SIP INVITE request contains a Message-Expires header as defined in Appendix C "*CPM-defined SIP Header* fields" and the value is below the maximum expiry time value per service provider policy, the CPM Participating Function SHALL set the expiry time value to the value contained in the SIP INVITE request Message-Expires header field; otherwise the CPM Participating Function SHALL set the expiry time value to the maximum expiry time value per service provider policy.

When a Deferred CPM Message reaches its associated expiry time value, the CPM Participating Function SHALL handle that Deferred CPM Message as described in section 8.3.1.5.8 "*Handling Deferred CPM Messages on Expiry Time*".

8.3.1.5.2 Pushing Deferred CPM Messages

The CPM Participating Function SHALL check if there is a rule in [OMA-XDM-Policy] in which the "enabler" attribute of the '<service>' sub-element inside the '<service-list>' element of the conditions part of the rule is set to "CPM" and the '<action>' element of the rule contains a '<allow-do-not-disturb>' sub-element set to "true".

If no such rule exists, then the CPM Participating Function MAY send an out-of-band notification as described in Appendix I.1.1 "*Out-of-band Deferred CPM Message Notification Format*".

Otherwise, if such a rule does exist, then the CPM Participating Function SHALL wait for the rule to be no longer present, and MAY then send an out-of-band notification as described in Appendix I.1.1 "*Out-of-band Deferred CPM Message Notification Format*".

NOTE: If more than one Deferred CPM Message awaits delivery, the above mentioned out-of-band notifications may only include summary information, as per Appendix I.1.1 "*Out-of-band Deferred CPM Message Notification Format*" and Appendix J.1 "*Deferred Messages Metadata*".

The CPM Participating Function SHALL wait until at least one CPM Client of the CPM User registers. When that happens, and the do-not-disturb flag in the user preferences is not set (determined as per above check in [OMA-XDM-Policy]), the CPM Participating Function SHALL handle each Deferred CPM Message as follows:

1. If the Deferred CPM Message is a Pager Mode CPM Standalone Message, the CPM Participating Function SHALL evaluate which of the registered CPM Clients are suitable to receive the Deferred Pager Mode CPM Standalone Message (see the note in step 7 of section 8.3.1.1 "*Handle a Pager Mode CPM Standalone Message*" for a description of what it means for a CPM client to be suitable) and delivers the message to those CPM Clients as described in section 8.3.1.6.6 "*Sending a Pager Mode Deferred CPM Message*", and removes the message from the

Deferred CPM Message queue. If no CPM Client is suitable, the CPM Participating Function keeps the message in the Deferred CPM Message queue.

2. If the Deferred CPM Message is a Large Message Mode CPM Standalone Message, the CPM Participating Function SHALL evaluate which of the registered CPM Clients are suitable to receive the Deferred Large Message Mode CPM Standalone Message (see the note in step 7 of section 8.3.1.1 "*Handle a Pager Mode CPM Standalone Message*" for a description of what it means for a CPM client to be suitable) and delivers the message to those CPM Clients as described in section 8.3.1.5.7 "*Sending a Large Message Mode Deferred CPM* Message". If no CPM Client is suitable, the CPM Participating Function keeps the message in the Deferred CPM Message queue.

8.3.1.5.3 Sending Notifications and Awaiting CPM Client Action

The CPM Participating Function SHALL check if there is a rule in [OMA-XDM-Policy] in which the "enabler" attribute of the '<service>' sub-element inside the '<service-list>' element of the conditions part of the rule is set to "CPM" and the '<action>' element of the rule contains an '<allow-do-not-disturb>' sub-element set to "true".

If such a rule does exist, then the CPM Participating Function SHALL wait for the rule to be no longer present, and SHALL then send a notification as described below.

When the rule on do-not-disturb does not exist (anymore), the CPM Participating Function SHALL determine which notification method to use based on the status of the CPM Clients of the recipient as follows by executing the following steps for each registered CPM Client:

1. If the user's registered CPM Client is suitable to receiveat least one of the Deferred CPM Messages present in the Deferred CPM Message queue (see the note in step 7 of section 8.3.1.1 "*Handle a Pager Mode CPM Standalone Message*" for a description of what it means for a CPM client to be suitable, the CPM Participating Function :
    a. SHALL generate a SIP MESSAGE request according to the rules and procedures of [RFC3428];
    b. SHALL include an Accept-Contact header field with the feature-tag set to 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.systemmsg' to indicate that the SIP MESSAGE request is a system message;
    c. SHALL include a P-Asserted-Service header field with the 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.systemmsg';
    d. SHALL set the Request-URI(s) to the address of this CPM Client;
    e. SHALL include the CPMDeferredMsgMgmtURI as the authenticated originator's CPM Address;
    f. SHALL include the User Agent header to indicate the CPM release version as specified in Appendix D "*Release Version in User-agent and Server headers*";
    g. SHALL include information about all Deferred CPM Message(s) in the message body, including the unique message-URI-ID assigned to the message when it was deferred;
    h. SHALL include metadata about the Deferred CPM Message(s) as described in Appendix I.1.2 "*In-band Deferred CPM Message Notification Format*";
    i. SHALL send the SIP MESSAGE request towards this CPM Client along the signalling path.

If none of the registered CPM Clients is suitable for at least one of the Deferred CPM Messages and if service provider policies allow retrieval of deferred messages (e.g. retrieval might be paused in roaming scenarios), the CPM Participating Function SHALL send an out-of-band notification as described in Appendix I.1.1 "*Out-of-band Deferred CPM Message Notification Format*" to all or selected known devices of the recipient.

NOTE 1: If more than one Deferred CPM Message awaits delivery, the above mentioned out-of-band notifications may only include summary information, as per Appendix I.1.1 "Out-of-band Deferred CPM Message Notification Format" and Appendix J.1 "Deferred Messages Metadata" , i.e. restrict itself to only send the "number" attribute indicating the number of Deferred Messages currently stored in the CPM Participating Function. For in-band notifications, it may happen that not all metadata about waiting messages will fit into one SIP MESSAGE request. In this case, the CPM Participating Function will send multiple SIP MESSAGE requests..

The CPM Participating Function SHALL take no further action with regards to these Deferred CPM Messages (except for handling them when they reach their associated expiry time value as described in section 8.3.1.5.8 "*Handling Deferred CPM Messages on Expiry Time*") until one CPM Client takes the initiative to decide what to do with the Deferred CPM Messages.

Upon receiving a SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred' included in the Accept-Contact header targeted to Request-URI CPMDeferredMsgMgmtURI:

5. If the CPM Participating Function determines that there are no Deferred CPM Messages to be managed, it SHALL send a SIP 488 "Not Acceptable Here" response and SHALL include a Warning header with the warning text set to "125 No messages" in the response according to the rules and procedures of [RFC3261].

   Otherwise continue with the rest of the steps;

6. The CPM Participating Function SHALL send a SIP 200 "OK" response, accepting the SDP received;

7. For each Deferred CPM Message identified in the URI list of the SIP INVITE request with the "cpm_action" parameter set to "delete", the CPM Participating Function SHALL delete the Deferred CPM Message from the Deferred CPM Message queue and SHALL send a delivery notification message as described in section **Error! Reference source not found.** "**Error! Reference source not found.**" to inform the sender of the CPM Message that the message was not delivered if a negative delivery notification was requested by the sender.

8. For each Deferred CPM Message identified in the URI list of the SIP INVITE request with the "cpm_action" parameter set to "interwork", the CPM Participating Function SHALL send the Deferred CPM Message towards the ISF as described in section 6.5 "*Communicating with the ISF"*.

9. For each Deferred CPM Message identified in the URI-list of the SIP INVITE request with the "cpm_action" parameter set to "store", the CPM Participating Function SHALL store the message in the CPM User's message store as described in [OMA-CPM_TS_MessageStorage] and SHALL send a delivery notification message as described in section **Error! Reference source not found.** "*Error! Reference source not found.*" to inform the sender of the CPM Message that the message was delivered if a positive delivery notification was requested by the sender.

10. For each Deferred CPM Message identified in the URI list of the SIP INVITE request with the "cpm_action" parameter set to "deliver", or for all Deferred CPM Messages if there is no URI list in the SIP INVITE request at all:

    a. If the deferred message is a Pager Mode CPM Standalone Message, the CPM Participating Function SHALL send the Deferred CPM Message to the CPM Client as described in section 8.3.1.5.6 "*Sending a Pager Mode Deferred CPM Message*".

    b. If the deferred message is a Large Message Mode CPM Standalone Message, the CPM Participating Function SHALL send the Deferred CPM Message to the CPM Client as described in section 8.3.1.5.7 "*Sending a Large Message Mode Deferred CPM* Message".

11. Any Deferred CPM Message not identified in the URI list of the SIP INVITE request is left deferred, and will be added to the next Deferred CPM Message notification to the CPM User. Conversely, handling instructions for any Deferred CPM Message identified in the URI list, but not present in the Deferred CPM Message queue anymore, SHALL be ignored.

12. When receiving a SIP ACK request, the CPM Participating Function SHALL ignore this request.

13. When receiving a SIP BYE request, the CPM Participating Function SHALL process this according to the rules and procedures of [RFC3261].

    NOTE 2: such a SIP ACK or SIP BYE request can arrive at any time after step 2, but must not affect execution of the following steps.

14. If the CPM Participating Function receives another SIP INVITE request from a different client of the same CPM User addressed to the same CPMDeferredMsgMgmtURI and with the same feature tag as indicated above, the CPM Participating Function SHALL handle such overlapping SIP INVITE requests in a first come first served manner.

8.3.1.5.4   Delivering Deferred CPM Messages to the Message Storage Server

The CPM Participating Function SHALL:

1. In case of a Pager Mode CPM Standalone Message,

a. SHALL remove the Disposition-Notification Header Field in CPIM header of the received CPM Standalone Message as defined in [RFC5438];

NOTE: If present, the request for read report is not removed by the CPM Participating Function.

b. If the SIP MESSAGE request contains an Expires header as defined in Appendix C "CPM-defined SIP Header fields" [RFC3428], and the value is below the maximum expiry time value per service provider policy, the CPM Participating Function SHALL set the Expires header to the value contained in the SIP MESSAGE request Expires header field; otherwise the CPM Participating Function SHALL set the Expires header to the maximum expiry time value per service provider policy.

2. In case of Large Message Mode CPM Standalone Message,

a. SHALL remove the Disposition-Notification Header Field in CPIM header of the received CPM Standalone Message as defined in [RFC5438];

NOTE: If present, the request for read report is not removed by the CPM Participating Function.

b. If the SIP INVITE request contains a Message-Expires header as defined in Appendix C "CPM-defined SIP Header fields" and the value is below the maximum expiry time value per service provider policy, the CPM Participating Function SHALL set the Expires header to the value contained in the SIP INVITE request Message-Expires header field; otherwise the CPM Participating Function SHALL set the Expires header to the maximum expiry time value per service provider policy.

3. SHALL hand over the message to the Message Storage Server according to procedures specified in section 6.3.1 "*Object Store Operation*" of [OMA-CPM_TS_MessageStorage];

4. If the originator of the CPM Standalone Message requested a "positive-delivery" disposition notification as defined in [RFC5438], SHALL generate a "positive-delivery" notification as described in section **Error! Reference source not found.** "*Error! Reference source not found.*".

NOTE: If Deferred CPM Messages are handed over to the Message Storage Server as described in this section, advanced functionality of the CPM Participating Function on Deferred CPM Messages (e.g. do-not-disturb or selective notifications with or without delivery to CPM Clients) will not be available.

8.3.1.5.5 Handle a Deferred CPM Message Information Request

NOTE: The Deferred CPM Message information request is handled as an originating network service.

Upon receiving a SIP SUBSCRIBE request with the Event header set to 'deferred-messages', the CPM Participating Function:

1. SHALL perform the actions to verify the authenticated originator's CPM Address and authorize the request and if it is not authorized the CPM Participating Function SHALL return a SIP 403 "Forbidden" response and SHALL include an Warning header with the warning text set to "127 Service not authorised" in the response according to the rules and procedures of [RFC3261];

Otherwise, continue with the rest of the steps;

2. SHALL generate a SIP 200 "OK" response to the SIP SUBSCRIBE request according to the rules and procedures of [RFC3265];

3. SHALL set the Contact header of the SIP response to the address of the CPM Participating Function;

4. SHALL send the SIP response towards the CPM Client according to the rules and procedures of the SIP/IP core;

5. SHALL generate an initial SIP NOTIFY request according to the rules and procedures of [RFC3265] with the clarifications in this section;

The CPM Participating Function SHALL include a MIME msginfo+xml body as follows:

a. SHALL include a <message-list> element;

b. SHALL include a <message> element for each of the deferred messages:

i. SHALL include the <message> attribute containing the elements defined in Appendix J "*Deferred Messages event package definition*".

6. SHALL send the NOTIFY request according to the rules and procedures of the SIP/IP core.

7. SHALL terminate the subscription for this event.

8.3.1.5.6 Sending a Pager Mode Deferred CPM Message

When the CPM Participating Function wants to send a Pager Mode Deferred CPM Message, the CPM Participating Function SHALL generate a SIP MESSAGE request according to the rules and procedures of [RFC3428]. The CPM Participating Function:

1. SHALL include an Accept-Contact header with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred' percent encoded in a g.3gpp.icsi-ref media feature tag according to [3GPP TS 24.229] section 7.2A.8.2 *"Coding of the ICSI"*;

2. SHALL include a Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred' percent encoded in a g.3gpp.icsi-ref media feature tag as per [3GPP TS 24.229] section 7.2A.8.2 *"Coding of the ICSI"*;

3. SHALL set the P-Asserted-Service header field with the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred';

4. SHALL include the authenticated originator's CPM Address in the original SIP MESSAGE request as the authenticated originator's CPM Address of the Pager Mode Deferred CPM Message;

5. SHALL include the Request-URI with the recipient CPM Address;

6. SHALL include a User-Agent header to indicate the OMA CPM release version of the Participating Function as specified in the Appendix D *"Release Version in User-agent and Server headers"*;

7. SHALL include the stored information of the Deferred CPM Message as defined in section 8.3.1.5 *"Defer CPM Standalone Messages"* in the SIP MESSAGE request.

8. SHALL check if the CPM User preferences for history recording <allow-offline-storage> is set to true and if so, it SHALL execute the processing described in 8.5 *"Record CPM Conversation History"*;

9. MAY replace each Media Object attached to the CPM Standalone Message with a reference, as described in section 8.3.1.3 *"Replacing Media with a Reference"*;

10. If recording is successful, SHALL include the UID information retrieved in section 8.5 *"Record CPM Conversation History"* in the Message-UID header of the SIP MESSAGE request;

11. SHALL send the SIP MESSAGE request according to the rules and procedures of the SIP/IP core.

Upon receiving a SIP 200 "OK" response to the sent SIP MESSAGE request, the CPM Participating Function SHALL remove the Deferred CPM Message from the Deferred CPM Message queue.

If an error response is received during the delivery of the Deferred CPM Message and the Deferred CPM Message was recorded to the Message Storage Server in step 6 above, the CPM Participating Function SHALL remove the message from the CPM User's Message Store as described in [OMA-CPM_TS_MessageStorage] and SHALL keep the message in the Deferred CPM Message queue.

8.3.1.5.7 Sending a Large Message Mode Deferred CPM Message

When the CPM Participating Function wants to send a Deferred Large Message Mode CPM Message, the CPM Participating Function SHALL generate an initial SIP INVITE request according to the rules and procedures of [RFC3261]. The CPM Participating Function:

1. SHALL include an Accept-Contact header with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred' percent encoded in a g.3gpp.icsi-ref media feature tag according to [3GPP TS 24.229] section 7.2A.8.2 *"Coding of the ICSI"*;

2. SHALL include a Contact header with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred' percent encoded in a g.3gpp.icsi-ref media feature tag according to [3GPP TS 24.229] section 7.2A.8.2 *"Coding of the ICSI"*;

3. SHALL set the P-Asserted-Service header field with the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred';

4. SHALL include the authenticated originator's CPM Address in the original SIP INVITE request as the authenticated originator's CPM Address of the Deferred Large Message Mode CPM Message;

5. SHALL include the Request-URI with the recipient CPM Address;

6. SHALL include a User-Agent header to indicate the OMA CPM release version of the Participating Function as specified in the Appendix D "*Release Version in User-agent and Server headers*";

7. SHALL include the option tag 'timer' in the Supported header;

8. SHALL include the Session-Expires header with the refresher parameter set to "uac" according to the rules and procedures of [RFC4028];

9. SHALL include in the SIP INVITE request a MIME SDP body as a SDP offer according to the rules and procedures of [RFC3264], [RFC4566],[RFC4975] , [RFC6135] and [draft-ietf-simple-msrp-sessmatch] with the following clarification:

   a. SHALL set the SDP directional media attribute to a=sendonly;

   b. SHALL set the content type as a=accept-types:message/cpim;

   c. SHALL set MSRP URI for the MSRP connection setup as a=path:MSRP URI;

   d. SHALL set the size as a=file-selector:size:actual message size;

   e. SHALL set the a=setup attribute as "passive".

10. SHALL send the SIP INVITE request according to the rules and procedures of the SIP/IP core.

Upon receiving a SIP 200 "OK" response to the SIP INVITE request, the CPM Participating Function:

1. SHALL start the SIP session timer using the value received in the Session-Expires header according to the rules and procedures of [RFC4028];

2. SHALL generate and send a SIP ACK request as an acknowledgement of the final response according to the rules and procedures of [RFC3261];

3. SHALL act as a "passive" endpoint according to [RFC6135] to establish the MSRP connection according to [RFC4975];

4. MAY replace each Media Object attached to the CPM Standalone Message with a reference, as described in section 8.3.1.3 "*Replacing Media with a Reference*";

5. SHALL generate one or more MSRP SEND requests (depending on whether chunking is used) according to the rules and procedures of [RFC4975] with the following clarifications:

   a. SHALL set To-Path header according to the MSRP URI(s) received in the answer SDP;

   b. SHALL set the content type as Content-Type = message/cpim as described in [RFC3862];

   c. SHALL set "From" header to the authenticated originator's CPM Address in the original SIP INVITE request ;

6. SHALL send the MSRP SEND request(s) on the established MSRP connection.

Once the Deferred CPM Message has been successfully transferred via MSRP, the CPM Participating Function:

1. if user preference was set to store the CPM Conversation History, the CPM Participating Function SHALL execute the processing described in section 8.5 "*Record CPM Conversation History*";

2. SHALL generate and send a SIP BYE request according to the rules and procedures of [RFC3261] and SHALL include the UID information retrieved in section 8.5 "*Record CPM Conversation History*" in the Message-UID header of the SIP BYE request;

3. SHALL remove the Deferred CPM Message from the Deferred CPM Message queue.

8.3.1.5.8 Handling Deferred CPM Messages on Expiry Time

On expiry of a Deferred CPM Message, the CPM Participating Function:

1. SHALL check the user preference <expired> retrieved from XDMS as described in 8.4.1 "*Retrieving User Preferences*",

2. SHALL determine which procedure to use based on the user preferences setting.

    a. if set to "discard",

        i. SHALL discard the expired Deferred CPM Message in the Deferred CPM Message queue;

        ii. MAY generate a notification to notify Deferred CPM Message was discarded after expiry.

            1. If at least one of the user's CPM Clients is registered, the CPM Participating Function:

                a. SHALL generate a SIP MESSAGE request to each registered CPM Client according to the rules and procedures of [RFC3428];

                b. SHALL include an Accept-Contact header field with the feature-tag set to 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.systemmsg' to indicate that the SIP MESSAGE request is a system message percent encoded in a g.3gpp.icsi-ref media feature tag according to [3GPP TS 24.229] section 7.2A.8.2 "Coding of the ICSI";

                c. SHALL set the P-Asserted-Service header field with the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm. systemmsg';

                d. SHALL set the Request-URI(s) to registered CPM Address(es) of the intended recipient;

                e. SHALL include the address of the CPM Participating Function in the authenticated originator's CPM Address;

                f. SHALL include the User Agent header to indicate the CPM release version as specified in Appendix D "*Release Version in User-agent and Server headers*";

                g. SHALL include information as described in Appendix I.2 "*Notification Format of Deferred CPM Message After Expiry*"

            2. Otherwise, the CPM Participating Function SHALL send an out-of-band notification as described in Appendix I.2 "*Notification Format of Deferred CPM Message After Expiry*".

        iii. SHALL send a delivery notification message as described in section **Error! Reference source not found.** "*Error! Reference source not found.*" to inform the sender of the CPM Standalone Message that the message was not delivered if a negative delivery notification was requested by the sender;

    b. if set to "store",

        i. SHALL send the request to store the expired message to the Message Storage Server as described in section 6.3 "*Message and History Operations*" in [OMA-CPM_TS_MessageStorage] and retrieve the information (e.g. UID) of stored headers from Message Storage Server as described in section 6.3 "*Message and History Operations*" in [OMA-CPM_TS_MessageStorage];

        ii. MAY generate a notification to notify the Deferred CPM Message was stored to the Message Storage Server after expiry.

            1. If at least one of the user's CPM Clients is registered, the CPM Participating Function:

                a. SHALL generate a SIP MESSAGE request to each registered CPM Client according to the rules and procedures of [RFC3428];

                b. SHALL include an Accept-Contact header field with the feature-tag set to 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.systemmsg' to indicate that the SIP MESSAGE request is a system message;

c. SHALL set the Request-URI(s) to registered CPM Address(es) of the intended recipient;

d. SHALL include the address of the CPM Participating Function in the authenticated originator's CPM Address;

e. SHALL include the User Agent header to indicate the CPM release version as specified in Appendix D "*Release Version in User-agent and Server headers*";

f. SHALL include information as described in Appendix I.2 "*Notification Format of Deferred CPM Message After Expiry*".

2. Otherwise, the CPM Participating Function SHALL send an out-of-band notification as described in Appendix I.2 "*Notification Format of Deferred CPM Message After Expiry*".

iii. SHALL send a delivery notification message as described in section **Error! Reference source not found.** "*Error! Reference source not found.*" to inform the sender of the CPM Standalone Message that the message was delivered if a positive deliver notification was requested by the sender;

8.3.2   CPM Session Handling

A CPM Participating Function in the terminating network may or may not stay in the media path depending on service provider's policies. These policies may be static such that the CPM Participating Function always stays or always does not stay in the media path, or the policies may depend on parameters such as:

1. If a CPM User has a subscription to the Message Storage Server and a user preference is set to record CPM Conversation History when he receives a CPM Session Invitation;

2. If the CPM Participating Function needs to do charging.

3. If the deferred delivery is enabled for the CPM User and supported by the CPM Participating Function.

When the CPM Participating Function stays in the media path acting as a back-to-back user agent (B2BUA), the following applies:

1. The CPM Participating Function acts as a user agent for both SIP sessions it connects. The B2BUA behaves as a user agent server for the incoming side and as a user agent client for the outgoing side(s).

2. The CPM Participating Function correlates both sides of the SIP session, by mapping the corresponding SIP session identities of the SIP sessions, and it maintains call state for all SIP sessions it handles, thus enabling end-to-end communication.

8.3.2.1   Handle a CPM Session Invitation

Upon receiving a SIP INVITE request of a CPM 1-1 Session or a CPM Group Session, the CPM Participating Function:

1. If the CPM Participating Function requires a specific User Agent version to be supported, the CPM Participating Function SHALL check the "User Agent" header field to determine if the CPM Participating Function supports the User Agent version and if not, the CPM Participating Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header field with the warning text set to "132 Version not supported" in the response according to the rules and procedures of [RFC3261].

Otherwise, continue with rest of the steps;

2. If the CPM Participating Function does not allow anonymity and anonymity is requested, the CPM Participating Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header field with the warning text set to "119 Anonymity not allowed" in the response according to the rules and procedures of [RFC3261].

Otherwise, continue with the rest of the steps;

3. SHALL check if the Authenticated Originator CPM Address of the SIP INVITE request is included in the chat Blacklist URI-list stored in [OMA-XDM-List]. If it is, then the CPM Participating Function SHALL return a SIP

403 "Forbidden" response and SHALL include a Warning header field with the warning text set to "122 Function not allowed" according to the rules and procedures of [RFC3261].

Otherwise, continue with the rest of the steps.

4. SHALL check if there is a rule in [OMA-XDM-Policy] in which the "enabler" attribute of the '<service>' sub-element inside the '<service-list>' element of the conditions part of the rule is set to "CPM" and the '<action>' element of the rule contains a '<allow-do-not-disturb>' sub-element set to "true". If such a rule exists then the CPM Participating Function SHALL return a SIP 480 "Temporarily Unavailable" response according to the rules and procedures of [RFC3261];

5. SHALL check the SIP INVITE request SDP attributes against service provider's policies specified for the service and for the CPM User. If media types of SDP do not conform to the service provider's policies, the CPM Participating Function SHALL return a SIP 488 "Not Acceptable Here" response according to the rules and procedures of [RFC3261]..

Otherwise, continue with the rest of the steps;

6. SHALL check that there is at least one CPM Client registered for the CPM User. If there are no suitable registered CPM Clients for the CPM User (see the note in step 7 of section 8.3.1.1 *Handle a Pager Mode CPM Standalone Message*" for a description of what it means for a CPM client to be suitable), the CPM Participating Function SHALL check the service provider policy. If the service provider policy is:

    a. To reject the CPM Session Invitation, then the CPM Participating Function SHALL return a SIP 480 "Temporarily Unavailable" response according to the rules and procedures of [RFC3261];

    b. To deliver the CPM Session Invitation using a non-CPM service the CPM Participating Function SHALL send the SIP INVITE request directly to the ISF as described in section 6.5 *Communicating with the ISF"*;

Otherwise, continue with the rest of the steps;

7. SHALL check if in the received SIP INVITE:

    i. the P-Preferred-Service header field is present and carries the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session'. In this case, the CPM Participating Function SHALL remove the P-Preferred-Service header field and add P-Asserted-Service header field and set it to 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session'; or

    ii. if P-Asserted-Service header field is present and carries the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session'. If another value is found and/or the CPM Feature tag is not supported by that CPM Participating Function or CPM Controlling Function, the CPM Participating Function MAY reject the SIP INVITE with a SIP 403 "Forbidden" response and a Warning header field with the warning text set to "122 Function not allowed" in the response according to the rules and procedures of [RFC3261];

8. If the CPM Participating Function stays in the media path, the CPM Participating Function:

    a. SHALL copy the received Request-URI;

    b. SHALL behave as a B2BUA according to the rules and procedures of [RFC3261] for the duration of the CPM Session;

    c. SHALL generate a SIP INVITE request according to the rules and procedures of [RFC3261] with the following details:

        i. SHALL copy the Contact header field and Accept-Contact header of the incoming SIP INVITE request to the outgoing SIP INVITE request;

        ii. SHALL insert a URI identifying its own address in the Contact header field;

        iii. SHALL include a SDP body as a SDP offer in the SIP INVITE request based on the received in the SDP as described in as described in section 5.2.1.2 *SDP Handling at Intermediate Nodes*";

        iv. if the SIP INVITE request contains a Session-Replaces header field (as defined in Appendix C *CPM-defined SIP Header* fields"), the CPM Participating Function SHALL forward the SIP

INVITE request to the CPM Client on which the CPM Session is being extended according to rules *and procedures of the SIP/IP core.*

v. If the SIP INVITE request does not contain a Session-Replaces header, SHALL check the offered Media Streams in the request and which ones of the user's registered CPM Clients are suitable to receive the request, then the CPM Participating Function:

- If at least one CPM Client is suitable to receive the request:

    a. SHALL include in the Reject-Contact header field the instance ID in the +sip.instance feature tag as described in [RFC3841] and [RFC5626] for those CPM Clients that are not suitable to receive the request; and

    b. SHALL set in the Request-Disposition header field the fork-directive attribute as "fork" and the parallel-directive attribute as "parallel"; and

    c. SHALL send the SIP INVITE request to the SIP/IP core which will fork the request to the appropriate user's registered CPM Clients according to the rules and procedures of the SIP/IP core.

- If no CPM Client is suitable to receive the request and interworking is determined by user preference and/or service provider policy the CPM Participating Function SHALL send the SIP INVITE request directly to the ISF without routing the SIP request via the SIP/IP core.

- Otherwise, SHALL respond to the SIP INVITE with a SIP 480 "Temporarily Unavailable" response.

9. If the CPM Participating Function does not stay in the media path, the CPM Participating Function:

    a. SHALL act as a SIP proxy according to the rules and procedures of [RFC3261] for the duration of the CPM Session;

    b. SHALL include a Record-Route header field containing a URI identifying its own address; and,

        i. If the SIP INVITE request contains a Session-Replaces header field (as defined in Appendix C "*CPM-defined SIP Header* fields"), SHALL forward the SIP INVITE request to the CPM Client on which the CPM Session is being extended according to rules and procedures of the SIP/IP core.

        ii. If the SIP INVITE request does not contain a Session-Replaces header field, SHALL check the offered Media Streams in the request and which ones of the user's registered CPM Clients are suitable to receive the request. Then the CPM Participating Function:

- If at least one CPM Client is suitable to receive the request:

    a. SHALL include in the Reject-Contact header field the instance ID in the +sip.instance feature tag as described in [RFC3841] and [RFC5626] for those CPM Clients that are not suitable to receive the request;

    b. SHALL set in the Request-Disposition header field the fork-directive attribute as "fork" and the parallel-directive attribute as "parallel".

    c. SHALL forward the SIP INVITE request to the SIP/IP core which will fork the request to the appropriate user's registered CPM Clients according to the rules and procedures of [RFC3261] and SIP/IP core.

- Otherwise, SHALL respond to the SIP INVITE with a SIP 480 "Temporarily Unavailable" response.

Upon receiving the first SIP 200 "OK" response from one of those appropriate CPM Clients, if the CPM Participating Function is acting as a B2BUA, the CPM Participating Function:

1. SHALL generate a SIP 200 "OK" response;

2. SHALL include an SDP body as a SDP answer based on the SDP answer received in the SIP 200 "OK" response as described in as described in section 5.2.1.2 "*SDP Handling at Intermediate Nodes"*;

3. SHALL include a SIP URI in the Contact header field that can resolve back to the original SIP URI in the received Contact header;

4. SHALL send the SIP 200 "OK" response according to the rules and procedures of SIP/IP core;

    a. In the case of CPM Participating Function use a Session History Folder, it SHALL create a CPM Session History Folder with the folder name set to the session-id value of the session info object at the Message Storage Server and create a session info object for the session in the folder and retrieve a UID from the Message Storage Folder for the session info object.

Upon receiving the first SIP 200 "OK" response from one of those appropriate CPM Clients, and when the CPM Participating Function is acting as a SIP proxy, the CPM Participating Function:

1. SHALL forward the SIP 200 "OK" response according to the rules and procedures of [RFC3261] and SIP/IP core;

2. SHALL continue to act as a SIP proxy for the duration of the CPM Session.

Upon receiving a SIP final response other than a SIP 200 "OK" response from all the appropriate CPM Clients, the CPM Participating Function SHALL

3. If a SIP 302 "Temporarily Moved" response was received, the CPM Participating Function SHALL send the CPM Session Invitation towards the address received in the Contact header of the response according to rules and procedures of [RFC3261];

4. If the SIP INVITE was sent out for a CPM Group Session, and one of the following SIP responses is received from the receiving CPM Client or other network entities on terminating network:

    A. SIP 480 "Temporarily Unavailable" or,

    B. SIP 408 "Timeout", or

    C. SIP 487 "Request Terminated", or

    D. SIP 500 "Server Internal Error", or

    E. SIP 503 "Service Unavailable", or

    F. SIP 504 "Server Timeout",

the CPM Participating Function SHALL generate a SIP 200 "OK" response towards the originating side following the procedures of forwarding a 200 "OK" response above, and SHALL stay in the media path;

5. Otherwise, the CPM Participating Function SHALL check the service provider policy;

    a. If the service provider policy is to deliver the session invitation using another non-CPM service, the CPM Participating Function SHALL send the SIP INVITE request directly to the ISF as described in section 6.5 "*Communicating with the ISF"*;

    b. Otherwise, the CPM Participating Function SHALL forward one of the error responses along the signalling path according to [RFC3261].

Upon receiving a SIP ACK request, the CPM Participating Function SHALL forward the SIP ACK request to the SIP/IP core according to the rules and procedures of the SIP/IP core for delivery to the first CPM Client that sent a SIP 200 "OK" response.

Upon receiving a SIP 200 "OK" response from ISF, if the CPM Participating Function is acting as a B2BUA, the CPM Participating Function:

1. SHALL check whether the all offered Media Streams have been accepted;

2. If not, the CPM Participating Function MAY attempt to establish a new session for the rejected Media Streams. To establish the new session the CPM Participating Function:

    a. SHALL check if service provider policy allows to establish a new session for the new Media Stream;

    b.   If allowed, SHALL generate a SIP INVITE request according to the rules and procedures of [RFC3261] with the following clarifications;

        i.   SHALL include SDP parameters about the rejected Media Streams in the SDP body as described in section 5.2.1.2 "*SDP Handling at Intermediate Nodes*" and information received in the SDP from the originating client;

        ii.   SHALL send the SIP INVITE request directly to the ISF as described in section 6.5 "*Communicating with the ISF*".

3.   Otherwise, SHALL perform the same procedures as receiving a SIP 200 "OK" response from a CPM Client.

8.3.2.2 Handle a Cancel Request

The CPM Participating Function SHALL handle a received SIP CANCEL request in exactly the same manner as when operating in the originating network, as described in section 8.2.2.2 "*Handling a Cancel Request*".

8.3.2.3 Handle a SIP BYE Request

Upon receiving a SIP BYE request associated with an existing CPM Session, a CPM Participating Function that acts as a SIP proxy SHALL forward the received SIP BYE request along the Signalling Path and upon receiving the SIP 200 "OK" response associated with the SIP BYE request, the CPM Participating Function SHALL forward the SIP 200 "OK" response along the same Signalling Path as the SIP BYE request according to the rules and procedures of [RFC3261].

Upon receiving a SIP BYE request associated with an existing CPM Session, a CPM Participating Function that acts as a B2BUA:

1.   SHALL release the Media Plane resources associated with the CPM session;

2.   If the SIP BYE request was sent by the CPM Client served by the CPM Participating Function, the CPM Participating Function:

    a.   SHALL generate a SIP BYE request for the other CPM entity of the affected CPM Session according to the rules and procedures of [RFC3261];

    b.   SHALL send the SIP BYE request according to the rules and procedures of [RFC3261].

If there is ongoing CPM File Transfer initiated in the CPM Session, the termination of the CPM Session SHALL not terminate the on-going CPM File Transfer for that CPM Participant, and vice versa.

    c.   Upon receiving a SIP 200 "OK" response from the other CPM entity associated with the SIP BYE request, the CPM Participating Function:

        i.   SHALL generate a SIP 200 "OK" response according to the rules and procedures of [RFC3261];

        ii.   If the action element <allow-offline-storage> is set to true and is using a CPM Session History Folder, the CPM Participating Function:

            1.   SHALL create and store the Group State Object,

            2.   SHALL include in the SIP 200 "OK" response a Message-UID header set to the retrieved UID information the session info object of the CPM Session.

        iii.   SHALL send the SIP 200 "OK" response according to the rules and procedures of [RFC3261].

3.   If the SIP BYE request was sent by the other CPM entity, the CPM Participating Function:

    a.   If the action element <allow-offline-storage> is set to true, the CPM Participating Function SHALL store the CPM Session to the Message Storage Server according to procedures specified in section 8.5.2 "*Record CPM Session*" and retrieve a UID from the Message Storage Server;

    b.   If the affected CPM Session is being interworked, the CPM Participating Function:

        i.   SHALL generate SIP BYE requests for each of the associated IWFs according to the rules and procedures of [RFC3261];

ii.   SHALL send these SIP BYE requests to the IWFs according to the rules and procedures of [RFC3261].

c.   Otherwise, when the affected CPM Session is not being interworked, the CPM Participating Function:

i.   SHALL generate a SIP BYE request for the CPM Client it serves according to the rules and procedures of [RFC3261];

ii.   SHALL include in the SIP BYE request a Message-UID header set to the retrieved UID information as defined in Appendix C "*CPM-defined SIP Header* fields".

iii.   SHALL send the SIP BYE request according to the rules and procedures of [RFC3261].

d.   Upon receiving a SIP 200 "OK" response from the CPM Client or the IWFs associated with the SIP BYE request, the CPM Participating Function SHALL generate and send a SIP 200 "OK" response towards the other CPM entity according to the rules and procedures of [RFC3261] and the SIP/IP core.

4.   If the SIP BYE request was sent by one of the IWFs involved in the interworking of the CPM Session, the CPM Participating Function:

a.   If the CPM Session is interworked towards multiple IWFs and the service provider policies indicate that only the Media Streams associated with the IWF that sent the SIP BYE request are to be closed, the CPM Participating Function SHALL send a SIP re-INVITE request for deleting the Media Streams associated with the IWF that sent the SIP BYE request to the other CPM entity, according to the rules and procedures of [RFC3261] and the SIP/IP core.

b.   Otherwise, if the CPM Session is interworked towards multiple IWFs and the service provider policies indicate closure of the entire CPM Session, or the CPM Session is interworked to a single IWF, the CPM Participating Function:

i.   If the action element <allow-offline-storage> is set to true, the CPM Participating Function SHALL store the CPM Session to the Message Storage Server according to procedures specified in section 8.5.2 "*Record CPM Session*" and retrieve a UID from the Message Storage Server;

ii.   SHALL generate a SIP BYE request for the other CPM entity according to the rules and procedures of [RFC3261];

iii.   SHALL send the SIP BYE request according to the rules and procedures of [RFC3261].

iv.   Upon receiving a SIP 200 "OK" response from the CPM Client associated with the SIP BYE request, the CPM Participating Function SHALL generate and send a SIP 200 "OK" response towards the IWF according to the rules and procedures of [RFC3261].

8.3.2.4   SIP Session Timer Expiry

On expiry of the SIP session timer and if the CPM Participating Function is behaving as a B2BUA for the affected CPM Session, the CPM Participating Function:

1.   SHALL create and store Group State Object, and retrieve a UID of the session info object of the Message Storage Server.

2.   If the affected CPM Session is being interworked, the CPM Participating Function:

a.   SHALL generate SIP BYE requests for each of the associated IWFs according to the rules and procedures of [RFC3261];

b.   SHALL send these SIP BYE requests according to the rules and procedures of [RFC3261].

3.   Otherwise, when the affected CPM Session is not being interworked, the CPM Participating Function:

a.   SHALL generate a SIP BYE request for the CPM Client that the CPM Participating Function serves according to the rules and procedures of [RFC3261];

b.   SHALL include in the SIP BYE request the Message-UID header set to the retrieved UID information as defined in Appendix C "*CPM-defined SIP Header* fields".

c.   SHALL send the SIP BYE request according to the rules and procedures of [RFC3261];

4.   SHALL generate a SIP BYE request for the other CPM entity of the affected CPM Session according to the rules and procedures of [RFC3261];

5.   SHALL send the SIP BYE request according to the rules and procedures of [RFC3261];

6.   SHALL release all Media Plane resources associated with the CPM Session according to the rules and procedures of [RFC3261] and [RFC4028].

If the CPM Participating Function behaves as a SIP proxy, it SHALL act as specified in [RFC4028].

8.3.2.5 Handling a CPM Session Modification Request

The CPM Participating Function SHALL handle a received CPM Session modification request (i.e. a SIP re-INVITE request) in exactly the same manner as when operating in the originating network, as described in section 8.2.2.5 ”*Handle a CPM Session Modification Request*”.

8.3.2.6 Handling of Participants Information

The CPM Participating Function SHALL handle the Participants Information in exactly the same manner as when operating in the originating network, as described in section 8.2.2.6. ”*Handle of Participants Information*”.

8.3.2.7 Receive Participant Information Notification

The CPM Participating Function SHALL handle the procedures for receiving Participants Information notifications in exactly the same manner as when operating in the originating network, as described in section 8.2.2.6. ”*Receive Participant Information Notification*”.

8.3.2.8 CPM Group Session Re-join Requests

The CPM Participating Function SHALL handle the re-join requests for CPM Group Session from the CPM Client in exactly the same manner as when operating in the originating network, as described in section 8.2.2.7. ”*CPM Group Re-join Requests*”.

8.3.2.9 Deferred CPM Group Session handling

Upon receiving a SIP BYE request associated with an existing CPM Session, the CPM Participating Function SHALL proceed as described in sect. 8.2.2.3. “*Handle a SIP BYE Request*“.

The CPM Participating Function SHALL stay in the media path of the CPM Group Session with the CPM Controlling Function, in view of a deferred delivery to the CPM User of all further CPM Messages exchanged within the CPM Group Session in the following cases:

1.   The SIP BYE was received on the session dialog with the CPM Client with a Reason header field with the reason-protocol set to SIP and a reason-cause set to a value that is different than 200, indicating that the CPM User has not left the session voluntarily;

2.   Timeout of the SIP INVITE sent to the CPM user;

3.   The MSRP connection towards the CPM Client fails.

The CPM Participating Function SHALL also subscribe to the focus of the CPM Group Session as described 8.2.2.6.2 “*CPM Long-lived Group Session*“, to obtain the latest Participant Information that will be delivered together with the CPM Group Session data during the deferred delivery.

The deferred delivery of a CPM Group Session is triggered in two ways:

A)   CPM Participating Function initiates it when the CPM Client becomes available, i.e. upon receiving 3rd party register;

B)   The CPM Client sends a re-join request as soon as it comes back online, and the CPM Participating Function receives the re-join before reacting on the 3rd party register and issuing an invitation to the CPM Client. In this case, the CPM Participating Function:

- SHALL not send any SIP INVITE to the CPM Client for the deferred delivery of the CPM Group Session,

- it SHALL use the session setup following the received re-join request also for deferred delivery purposes. The deferred delivery of the missed CPM Group Session data is performed over MSRP.

8.3.2.9.1 Deferred delivery initiated by the CPM Participating Function

8.3.2.9.1.1 1-1 CPM Session delivery

If any CPM Sessions data is pending deferred delivery for the CPM User, then the CPM Participating Function should process the deferred delivery of the CPM Chat Message(s) grouped per original sender. The order in which the senders are processed may be based on service provider policy (e.g. based on the CPIM DateTime header field).

The CPM Participating Function performing deferred delivery of CPM Chat Message(s):

1. SHALL generate an initial SIP INVITE request according to rules and procedures of [RFC3261] and with the additional clarification as specified in section 7.3.1.1. *" Initiating a CPM 1-1 Session"*;

2. SHALL set the Request-URI of the SIP INVITE request to the intended recipient CPM User;

3. SHALL address the request to the CPM User device using the procedures described in section 6.1.2. "Identifying the recipient device in SIP requests and responses";

4. SHALL set the P-Asserted-Identity header field to the CPMDeferredMsgMgmtURI value configured as per operator policy identifying the CPM Participating Function;

5. SHALL include an Accept-Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred' percent encoded in a g.3gpp.icsi-ref media feature tag according to [3GPP TS 24.229] section 7.2A.8.2 "Coding of the ICSI";

6. SHALL include a Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred' percent encoded in a g.3gpp.icsi-ref media feature tag according to [3GPP TS 24.229] section 7.2A.8.2 *"Coding of the ICSI"*;

7. SHALL set the P-Asserted-Service header field with the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred';

8. SHALL set the Referred-By header field to the value of the original sender of the chat message(s) to be delivered

9. SHALL include an SDP body as an SDP offer in the SIP INVITE request based on the received SDP from the original SIP INVITE, as described in section 5.2.1.2 "SDP Handling at Intermediate Nodes", and it SHALL set the SDP directional media attribute to a=sendrecv, indicating that the session is setup for delivery and also accepts disposition notifications to be sent back from the receiving CPM Client;

10. SHALL send the SIP INVITE request towards the CPM User according to rules and procedures of the SIP/IP Core.

11. CPM Participating Function SHALL process the SIP response from the targeted CPM Client according to [RFC3261] with the following clarifications:
    a. Upon receiving a SIP 200 "OK", and after responding with the SIP ACK:
        i.   SHALL start the SIP Session timer using the value received in the Session-Expires header field according to rules and procedures of [RFC4028];
        ii. SHALL generate MSRP SEND requests containing a message/CPIM body that includes the content of each deferred CPM Chat Message originated by the CPM User indicated in the Referred-By header field during session setup, according to the rules and procedures defined in [RFC4975].
        iii. It SHALL accept the IMDN notifications from the receiving CPM Client, and it SHALL generate corresponding IMDN notifications via SIP Message towards the sender when the CPM Session is no longer established with the originating side, as per procedures described in section 5.4.1 *"Generate Delivery Notification"* and 5.4.2. *"Generate Read Report"*;

iv.   once all deferred CPM Chat Messages from the original sender have been delivered (e.g. reception of the MSRP 200 OK of the last MSRP SEND), it SHALL send a SIP BYE request and wait for a 200 "OK" response as described in [RFC3261].

NOTE 1: If at any point during the deferred delivery the CPM Participating Function receives a SIP BYE request, it will respond to the SIP BYE request as described in [RFC3261], and keep any undelivered messages for delivery at another time.

NOTE 2: When a second 200 "OK" response is received on a SIP INVITE request from a CPM User with whom a 1-1 CPM Session is already established, the CPM Participating Function will terminate the existing session by sending a SIP BYE request with Reason header field containing a cause value=200 (Call completed elsewhere). This situation may happen when multiple SIP INVITE requests have been sent to a CPM User, and more than one of these requests are answered with a 200 "OK" response.

b.   Upon receiving a SIP 480 "Temporarily Unavailable" error response:

- the CPM Participating Function SHALL stop attempting to deliver any further deferred CPM Chat Message from any sender, until the next call to this procedure.

NOTE: Based on service provider policy, in addition to the SIP 480, other error codes may also end this procedure.

Once all deferred CPM Chat Messages from the original sender have been delivered, and if deferred delivery of associated disposition notifications has not yet begun, the CPM Participating Function MAY return disposition notifications to the targeted device(s) of the original sender as per section 8.3.4 "Sending a Disposition Notification", when requested by the sender as described in [RFC5438], if the CPM Client does not support IMDNs. Otherwise, the CPM Participating Function SHALL just proxy any IMDNs returned by the receiving CPM Client via SIP MESSAGE method, for the delivered CPM Chat Message(s).

The CPM Participating Function performing delivery of IMDNs associated with the delivered CPM Chat Message(s):

1. SHALL generate an initial SIP INVITE request according to rules and procedures of [RFC3261] and with the following additional clarifications;

2. SHALL set the Request-URI and To header fields to the authenticated Originator's CPM Address of the original sender of the message receiving the stored notification;

3. SHALL add the device identifier of the CPM Client that generated the IMDN, to the SIP INVITE request as defined in section 7.5.1. "*Multidevice handling*";

4. SHALL set the Referred-By header field to the authenticated originator's CPM Address (i.e. the sender of the notification).

5. SHALL set the P-Asserted-Identity header field to the CPMDeferredMsgMgmtURI value configured as per operator policy identifying the CPM Participating Function;

6. SHALL include an Accept-Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred' percent encoded in a g.3gpp.icsi-ref media feature tag according to [3GPP TS 24.229] section 7.2A.8.2 "Coding of the ICSI";

7. SHALL include a Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred' percent encoded in a g.3gpp.icsi-ref media feature tag according to [3GPP TS 24.229] section 7.2A.8.2 "Coding of the ICSI";

8. SHALL set the P-Asserted-Service header field with the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred';

9. SHALL include the Contact header field to an address that allows contacting the CPM Participating Function.

10. SHALL include a User-Agent header field to indicate the OMA CPM release version of the Participating Function as specified in the Appendix D "Release Version in User-agent and Server headers";

11. SHALL include an SDP body as an SDP offer in the SIP INVITE request according to the rules and procedures of [RFC3264] and [RFC4566] and allowing to establish an MSRP session to the targeted client:

   a) add a directional media 'sendonly' attribute that modifies the "m=message" line in the SDP;

   b) for the "m=message"line, add an 'accept-types' attribute listing only the content-type message/cpim; and

   c) for the "m=message" line, add an 'accept-wrapped-types' attribute listing only the content-type message/imdn+xml.

12. SHALL send the SIP INVITE request towards the CPM User according to rules and procedures of the SIP/IP Core.

Upon receiving an error response, the CPM Participating Function SHALL stop delivery of any further IMDN notifications at this time.

Upon receiving a SIP 200 "OK" response to the SIP INVITE request, the CPM Participating Function:

1. SHALL start the SIP Session timer using the value received in the Session-Expires header field according to rules and procedures of [RFC4028];
2. SHALL store the CPM Session Identity if received in the Contact header field as described in [RFC 3261]; and,
3. SHALL generate a MSRP SEND request including a message/CPIM body with the content of the deferred notification, for each deferred notification originated by the CPM User indicated in the Referred-By header field during session setup and targeted at the device that accepted the session, according to the rules and procedures defined in [RFC4975].

Once all deferred disposition notifications targeted to a device of a CPM User are delivered, the CPM Participating Function SHALL send a SIP BYE request and wait for a 200 OK response as described in [RFC3261].

Upon receiving a SIP BYE request from the CPM Client, the CPM Participating Function SHALL respond to the SIP BYE request as described in [RFC3261], and keep any undelivered notifications for delivery at another time.

Based on service provider policy, the CPM Participating Function SHALL deliver the deferred IMDNs in one of the following ways:

   1) it MAY send the IMDN in an already on-going MSRP session, if that session is established with the targeted device of the original sender CPM User, or

   2) it MAY keep the IMDN until such time as the CPM Participating Function establishes a session to deliver the pending IMDN notifications to the targeted device of the original sender CPM User, or

   3) it MAY send the IMDN via a SIP MESSAGE request as described in section 5.4 "Disposition Notifications".

When a delivery notification is received for a deferred CPM Chat Message, the CPM Participating Function is no longer required to keep that message.

8.3.2.9.1.2 CPM Group Session delivery

Upon receiving 3rd party register event notification for a CPM Client, the CPM Participating Function SHALL initiate the deferred delivery of any pending CPM Group Session data (i.e. that the CPM User has missed, or it has incompletely received).

The CPM Participating Function SHALL establish one session per each CPM Group Session delivery, using a SIP INVITE request towards the CPM Client, as follows:

   1) If the CPM Group Session is active at the time of deferred delivery:

      a. the SIP INVITE SHALL contain

         i. the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' included in the Accept-Contact header field and Contact header field, percent encoded in a g.3gpp.icsi-ref media feature tag according to [3GPP TS 24.229] section 7.2A.8.2 *"Coding of the ICSI"*, and all the original CPM Group Session information;

ii. SHALL set the P-Asserted-Identity header field to the CPMDeferredMsgMgmtURI value configured as per operator policy identifying the CPM Participating Function;

iii. SHALL set the P-Asserted-Service header field with the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred';

b. the SDP body of the SIP INVITE SHALL be set as per the SDP offer of the original CPM Group Session invitation, as specified in step 7.c.iii, including the SDP directional media attribute, which SHALL be set to a=sendrecv indicating bi-directional media being allowed in the CPM Group Session;

c. upon receiving 200 "OK":

i. the CPM Participating Function SHALL deliver in order the deferred CPM Messages and disposition notifications of that CPM Group Session to the CPM Client, it SHALL re-join the CPM Client with the on-going conference to enable the delivery of live CPM Chat Messages.

ii. the CPM Participating Function MAY unsubscribe from the conference event package for the CPM Group Session focus.

iii. the CPM Participating Function SHALL handle the CPM Client re-join request as described in section 8.3.2.8. "*CPM Group Re-join Requests*".

d. Upon receiving "603":

i. the CPM Participating Function SHALL discard all deferred CPM Messages and disposition notifications for that CPM Group Session;

ii. it SHALL send a SIP BYE with Reason code set to SIP protocol and cause=603 to the conference focus of the CPM Group Session;

iii. the CPM Participating Function SHALL unsubscribe from the conference event package for the CPM Group Session focus.

e. Otherwise, for any other SIP error responses it MAY re-attempt the deferred delivery (e.g. 480 "Temporary Unavailable" from the CPM Client), based on service provider policies.

2) If the CPM Group Session is inactive at the time of deferred delivery, then the deferred delivery of the CPM Group Session is performed as per procedures described in sect. 8.3.2.9.1.1. "*1-1 CPM Session Delivery* ", with the following clarifications:

- Step 8 from sect. 8.3.2.9.1.1. "*1-1 CPM Session Delivery* " is replaced with the following :

i. CPM Participating Function SHALL set the SDP directional media attribute to a=sendonly, indicating that the session is setup for delivery only. Since the deferred delivery session is unidirectional, no IMDN notifications are expected to be received from the CPM Client via MSRP inside the deferred delivery session;

- The latest Participants Information is delivered in a MSRP SEND request, using the MIME type and schema of the Group State Object defined in sect. 5.2.8 "*Group State Object* " of [OMA-CPM_TS_MessageStorage].

3) The CPM Participating Function SHALL perform the procedure described in step 7 of sect. 8.3.2.1. "*Handle a CPM Session Invitation* ", with the following clarifications

- If the original invitation to the CPM Group Session was accepted by any one of the CPM User devices before the CPM Client has been booted from the CPM Group Session, then the step 7.c.v. is not executed, but instead, the deferred delivery of the CPM Group Session is made to the same CPM User device.

  To that effect, the CPM Participating Function SHALL include in the Accept-Contact header the instance ID of the device in the +sip.instance feature tag as described in [RFC3841] and [RFC5626] for the CPM Client that must receive the request.

4) The CPM Participating Function SHALL handle the response received from the CPM Client and the SIP ACK as per procedures described in sect. 8.3.2.1. "*Handle a CPM Session Invitation*" for the CPM Participating Function acting as a B2BUA.

5) If during the deferred delivery procedure of a CPM Group Session, the CPM Participating Function receives from the CPM Client :

   a) an SIP error response to the SIP INVITE, then the CPM Participating Function MAY re-attempt the deferred delivery (e.g. 480 "Temporary Unavailable" from the CPM Client), based on service provider policies.

   b) a SIP BYE with a Reason header field containing a cause value of 200 during a deferred delivery, then the CPM Participating Function SHALL proceed as described in as described in sect. 8.2.2.3. "*Handle a SIP BYE Request*" and it SHALL also discard all remaining deferred messages for that CPM Group Session.

8.3.2.9.1.3 Deferred delivery performed upon CPM Client re-join

Following a CPM Group Session that was previously interrupted with the CPM Client (due to e.g. connectivity loss), the CPM Participating Function could receive a re-join SIP INVITE request from the CPM Client, before receiving of, or reacting on, a 3rd party register notification informing of the CPM Client registration in IMS.

In such case, the CPM Participating Function SHALL proceed with the handling of the re-join request and SHALL also perform any deferred delivery of the CPM Group Session data missed, or accumulated in the absence of, the CPM Client.

The CPM Participating Function SHALL provide all the pending CPM Group Session data (i.e. that the CPM User has missed, or it has incompletely received) over MSRP messages.

1) If the CPM Group Session is inactive:

   - the last Participants Information is provided by the CPM Participating Function inside a MSRP SEND using the MIME type and schema of the group state object as defined in sect. 5.2.8 "*Group State Object*" of [OMA-CPM_TS_MessageStorage], and

   - the CPM Participating Function SHALL proceed with the re-start procedure for the CPM Long-lived Group Session. If the CPM Long-lived Group Session could not be re-started and a SIP error response is received from the CPM Controlling Function, the CPM Participating Function SHALL send a SIP BYE to the CPM Client with a Reason header field populated with a reason-protocol SIP and the appropriate reason-cause value of the SIP error received from the focus (e.g. 404, or 403);

   - if the CPM Client has sent any message(s) to the participants of the CPM Group Session, and the CPM Group Session could not be re-started with the CPM Controlling Function, then the CPM Participating Function SHALL send a MSRP failure delivery notification to the CPM Client.

2) If the CPM Group Session is active:

   - it SHALL join the session dialog with the CPM Client with the session dialog of the CPM Group Session with the CPM Controlling Function.

8.3.2.9.1.4 Deferred delivery race conditions

In the unlikely case when the CPM Participating Function has sent out the SIP INVITE for the CPM Group Session deferred delivery, but it immediately receives the CPM Client's re-join request for the same CPM Group Session, the CPM Participating Function SHALL:

- if the CPM Group Session is still active:

   o keep only one session active with the CPM Client B for the same CPM Group Session, by rejecting the re-join that comes in after the SIP INVITE was already sent out by the CPM Participating Function with a SIP response error 491 "Request pending";

- if the CPM Group Session is inactive:

   o complete the deferred delivery of the pending CPM Group Session data within the deferred delivery session already initiated by the CPM Participating Function, and then in parallel it SHALL forward the CPM Client B re-join request towards a CPM Controlling Function to re-start the CPM Group Session.

8.3.3   CPM File Transfer Handling

8.3.3.1   Handle a CPM File Transfer Initiation

The CPM Participating Function SHALL handle a CPM File Transfer initiation request (i.e. a SIP INVITE request that includes the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.filetransfer' in the Accept-Contact header) in exactly the same manner as described for CPM Session Invitations in section 8.3.2.1 "*Handle a CPM Session Invitation*" , with the clarification that the CPM Feature Tag expected and checked is the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.filetransfer'.

With respect to the SDP contents of outgoing SIP INVITE requests the CPM Participating Function SHALL follow the rules and procedures of [RFC5547].

8.3.3.2   Handle a CPM File Transfer Closing Request

The CPM Participating Function SHALL handle the closing of a CPM File Transfer session in exactly the same manner as defined for CPM Sessions in section 8.3.2.3 "*Handle a SIP BYE Request*", with the following clarifications:

1.   if the action element <allow-offline-storage> is set to true for the terminating CPM User, then follow procedures described in section 8.2.3.2 "*Handle a CPM File Transfer Closing Request*" steps 1 and 2.

8.3.3.3   Handling Deferred CPM File Transfer File(s)

The CPM Participating Function SHALL support deferred delivery of CPM File Transfer file(s) to the terminating CPM Client. The deferred delivery of the CPM File Transfer file(s) occurs in the following cases:

1)   original SIP INVITE expired, based on the a timer of the CPM Participating Function local policy,
2)   the terminating CPM Client is offline,
3)   the originating or terminating CPM Client loses connectivity,
4)   due to an error (see Table 2 below).

Response received on terminating CPM Client or Participating Function	Response sent on originating CPM Client or Participating Function	Store the file
480 Temporarily unavailable	200 OK	Y
408 Request Timeout	200 OK	Y
487 Request Terminated	200 OK	Y
500 Server Internal Error	200 OK	Y
503 Service Unavailable	200 OK	Y
504 Server Timeout	200 OK	Y
600 Busy Everywhere	200 OK	Y
Any other response (including 404 Not Found, 603 Decline and 200 OK)	Received response (that is no mapping is done)	N

Table 2: Handling deferred and delivery mapping response

NOTE: The decision of when the CPM Participating Function accepts the initial SIP INVITE and stays in the media path of a CPM File Transfer is out of the scope of this specification. However, it is RECOMMENDED that the CPM Participating Function stay in the media path to provide better user experience.

If the terminating CPM Participating Function is configured to stay in the media path on behalf of the CPM Client, then the following cases SHALL be supported:

1) In the case when the original SIP INVITE expired, based on the a timer in the local policy the CPM Participating Function:
    a) SHALL cancel the SIP INVITE request toward the terminating CPM Client by sending a SIP CANCEL, with reason header, Reason: SIP ;cause=408 ;text="User not responding";
    b) SHALL store the SDP attributes as defined in Section 8.3.3.7 "Storing CPM File Transfer Deferred Information";
    c) SHALL return a SIP "200" OK response with an SDP answer containing the file identities of the files as described in [RFC5547];
    d) SHALL execute the Media Plane procedures as described in section 8.3.3.9 "Media Plane Handling for MSRP Session" to receive the files

2) In the case when CPM Client was online, but an error as described in the Table 2, is received after the SIP INVITE was sent, the CPM Participating Function:
    a) SHALL store the SDP attributes as defined in Section 8.3.3.7 "Storing CPM File Transfer Deferred Information";
    b) SHALL return a SIP "200" OK response with an SDP answer containing the file identities of the files as described in [RFC5547];
    c) SHALL execute the Media Plane procedures as described in section 8.3.3.9 "Media Plane Handling for MSRP Session" to receive the files

3) In the case when CPM Client is offline, the CPM Participating Function:
    a) SHALL store the SDP attributes as defined Section 8.3.3.7 "Storing CPM File Transfer Deferred Information";
    b) SHALL return a SIP "200" OK response with an SDP answer containing the file identities of the files as described in [RFC5547];
    c) SHAL execute the Media Plane procedures as described in section 8.3.3.9 "Media Plane Handling for MSRP Session" to receive the files

8.3.3.4   Delivering deferred CPM File Transfer file(s):

CPM Participating Function SHALL support deferred delivery CPM File Transfer file(s) in the following cases:

1) Upon receiving a new SIP INVITE request to resume the transfer of the stored CPM File Transfer file(s), CPM Participating Function SHALL accept the session and establishes an appropriate Media Plane session, according to the procedures described in Section 8.3.3.6 "Receiving SIP INVITE request for deferred delivery CPM File Transfer file(s)".
2) SHALL send SIP INVITE as defined in Section 8.3.3.5 "Generating SIP INVITE request for deferred CPM File Transfer file(s)" to the terminating CPM Client, upon receiving a 3rd party register of the terminating CPM Client, provided that CPM Participating Function is also serving the terminating CPM Client.
3) The CPM Participating Function MAY send SIP INVITE as defined in Section 8.3.3.5 "Generating SIP INVITE request for deferred delivery CPM File Transfer file(s)", periodically without receiving 3rd party registration. The timing and frequency of File Transfer session initiations are subject to Service Provider policies.

Upon successfully delivery of the deferred CPM File Transfer file(s) to the terminating CPM Client(s), the CPM Participating Function SHOULD remove the deferred CPM File Transfer file(s).

8.3.3.5   Generating SIP INVITE request for deferred delivery of CPM File Transfer file(s)

For deferred CPM File Transfer file(s) to be delivered to the CPM Client, the CPM Participating Function:

1) SHALL generate a SIP INVITE request according to the rules and procedures of [RFC3261] and [RFC5547];
2) SHALL include a User-Agent header to indicate the OMA CPM release version of the CPM Participating Function as specified in Appendix D "Release Version in User-agent and Server headers";
3) SHALL set the P-Asserted-Identity header field to the CPMDeferredMsgMgmtURI value configured as per operator policy;
4) SHALL set the P-Asserted-Service header field with the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.filetransfer';
5) SHALL set the Referred-By header to the value of the original sender of the CPM File Transfer file(s) to be delivered
6) SHALL include an Accept-Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.filetransfer' percent encoded in a g.3gpp.icsi-ref media feature tag according to [3GPP TS 24.229] section 7.2A.8.2 *"Coding of the ICSI"*,

7) SHALL include a Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.filetransfer' percent encoded in a g.3gpp.icsi-ref media feature tag according to [3GPP TS 24.229] section 7.2A.8.2 *"Coding of the ICSI"*,

8) SHALL insert a URI identifying its own address CPMDeferredMsgMgmtURI in the Contact header field of the SIP INVITE request;

9) SHALL include an SDP body as an SDP offer, as defined in [RFC5547] in the SIP INVITE

10) If the destination address is neither SIP URI address nor TEL URI address, the CPM Participating Function SHALL send the SIP INVITE request directly to the ISF as described in section 6.5 "Communicating with the ISF". Otherwise the CPM Participating Function SHALL send the SIP INVITE request according to the rules and procedures of the SIP/IP core.

8.3.3.6 Receiving SIP INVITE request for deferred delivery of CPM File Transfer file(s)

Upon receiving a SIP INVTE request with a CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.filetransfer' in the Accept-Contact header initiated by the served CPM Client, the CPM Participating Function:

1) SHALL check whether the authenticated originator's CPM Address is of a CPM User that is allowed to send the request and if not, the CPM Participating Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "127 Service not authorised" in the response according to the rules and procedures of [RFC3261].

2) If the CPM Participating Function requires a specific User Agent version to be supported, the CPM Participating Function SHALL check the "User Agent" header field to determine if the CPM Participating Function supports the User Agent version as defined in Appendix D "Release Version in User-agent and Server headers" and if not, the CPM Participating Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "132 Version not supported" in the response according to the rules and procedures of [RFC3261].

3) If the CPM Participating Function does not allow anonymity and anonymity is requested, the CPM Participating Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "119 Anonymity not allowed" in the response according to the rules and procedures of [RFC3261]

4) SHALL check if in the received SIP INVITE:

   a. the P-Preferred-Service header field is present and carries the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.filetransfer'. In this case, the CPM Participating Function SHALL remove the P-Preferred-Service header field and add P-Asserted-Service header field and set it to 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.filetransfer'; or

   b. if P-Asserted-Service header field is present and carries the value of the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.filetransfer'. If another value is found, the CPM Participating Function MAY reject the SIP INVITE with a SIP 403 "Forbidden" response;

5) SHALL verify the received file-transfer-id and file-name SDP attributes with previously stored value. If the SDP does not match, the CPM Participating Function SHALL response with a SIP 488 "Not Acceptable Here" response with the correct SDP parameters.

When sending a SIP 200 "OK" response, the CPM Participating Functionr:

1) SHALL generate a SIP 200 "OK" response according to rules and procedures of [RFC3261];

2) SHALL include a Server header to indicate the OMA CPM release version of the CPM Participating Function as specified in Appendix D "Release Version in User-agent and Server headers";

3) SHALL include the SDP answer containing the file identities of the files as described in [RFC5547];

4) SHALL execute the Media Plane procedures as described in section 7.3.9.1 "MSRP-based Media Streams" to receive the files.

8.3.3.7 Storing CPM File Transfer Deferred Information

When storing a deferred CPM File Transfer file(s) for later delivery receiving to CPM Client, the terminating CPM Participating Function:

1) SHALL store all the CPM File Transfer request headers;

2) SHALL the store file-selector attributes according to[RFC5547]: 'name', 'size', 'type', and 'hash'

3) SHALL store file-transfer-id

8.3.3.8   Timing between originating and terminating Participating Function

When deploying deferred CPM File Transfer, the timing to trigger the deferred and delivery procedure SHOULD take into account whether deferred and delivery is supported on the terminating side, the timer (or time to trigger the error that signals store and forward is required) SHALL be significantly smaller than the timer used on the originating deferred and delivery process. Consequently, the following recommendations SHOULD be followed:

The timer on the originating CPM Participating Function SHOULD be greater than ½ the SIP INVITE timeout period

The timer on the terminating CPM Participating Function (or time to trigger the error) SHOULD be smaller than ¼ the SIP INVITE timeout period.

8.3.3.9   Media Plane Handling for MSRP Session

For MSRP-based Media Streams, the CPM Participating Function SHALL follow the rules and procedures defined in [RFC4975] with the following clarification:

1) SHALL maintain a MSRP session for each participant who accepted the MSRP session;
2) SHALL act as MSRP client for sending MSRP SEND request according to [RFC6135];
3) SHALL act as an "active" or "passive" endpoint according to [RFC6135];
4) SHALL establish the MSRP connection towards each participant who accepted the MSRP session according to the MSRP connection parameters in the SDP answer received in the 200 "OK" response according to [RFC6135]

8.3.4   Sending a Disposition Notification

The CPM Participating Function SHALL generate and send a disposition notification in the following cases:

1. When failing to deliver a CPM Message(s), CPM File Transfer file(s) and a "negative-delivery" notification was requested by the originator of the CPM Message, or

2. When successfully delivering the CPM Message(s) or CPM File Transfer file(s) (including successful deferred delivery) to a CPM Client that does not support IMDN for that type of CPM Message or CPM File Transfer, as detected in the User-Agent header field (e.g. a CPM v1.0 client does not support IMDN for CPM Chat Messages) or

3. When a CPM Chat Message is discarded after expiry according to user preferences and a "negative-delivery" notification was requested by the originator of the CPM Chat Message.

When having to generate and send a disposition notification, the CPM Participating Function SHALL generate a disposition notification as described in sect. 5.4.1. "Generate Delivery Notification", with these clarifications:

1. The CPM Participating Function SHALL set the <status> field within the <delivery-notification> element of the IMDN to the correct value (i.e. <delivered/> for a "positive-delivery" notification and <failed/> for a "negative-delivery" notification).

2. If an IMDN-Record-Route header field was received in the corresponding CPM Chat Message, the CPM Participating Function SHALL include in the Request-URI the topmost entry from the IMDN-Route header field;

3. If no IMDN-Record-Route header field was received in the corresponding CPM Chat Message, the CPM Participating Function SHALL include in the Request-URI either the public GRUU of the sender included in the Contact header field of the received SIP INVITE request or response, or the authenticated CPM Address of the sender obtained from the received SIP INVITE request or response;

4. The CPM Participating Function SHALL set the CPIM To header to either the public GRUU of the sender included in the Contact header of the received SIP INVITE request or response, or to the authenticated CPM Address of the sender obtained from received SIP INVITE request or response;

5. The CPM Participating Function SHALL send the SIP MESSAGE request carrying the disposition notification to the SIP/IP core according to the rules and procedures of the SIP/IP core.

For network optimization purposes, the aggregation of IMDNs as specified in [RFC5438] MAY be supported by the CPM Participating Function.

If the aggregated IMDNs are supported, a CPM Participating Function MAY aggregate the IMDNs accordingly before delivering them to its own CPM Clients, subject to Service Provider policies.

When IMDNs are sent to a remote network, the CPM Participating Function SHALL send the IMDN for each individual CPM Chat Message or CPM File Transfer file, leaving the target CPM Participating Function to handle them as per its own support and Service Provider policies (i.e. either aggregate them before delivery to clients, or deliver them individually).

When an error occurs during the MSRP session of the original CPM File Transfer request, the CPM Participating Function SHALL send a SIP MESSAGE with the delivery notification <status> sub-element of "failed" directly to the original sender or of the CPM File Transfer.

8.4 User Preferences

The CPM User preferences stored in [OMA-XDM-Policy], User Preferences Profiles stored in [OMA-XDM-Policy] and active User Preference Profile indication stored in [OMA-XDM-UPP] can be accessed and managed according to procedures as specified in [OMA-XDM-Core].

8.4.1 Retrieving User Preferences

For retrieving the user preferences corresponding to the CPM User being served, the CPM Participating Function:

1. SHALL access the User Access Policy document specified in [OMA-XDM-Policy], according to procedures specified in [OMA-XDM-Core], to retrieve the user preferences including the user preferences of any User Preferences Profile;

2. When the CPM Participating Function needs to evaluate device-specific preferences, it SHALL access the UPP Directory document specified in [OMA-XDM-UPP], according to procedures in [OMA-XDM-Core], to identify the active User Preferences Profile specified in <active-upp> element for each CPM User's registered device(s).

8.5 Record CPM Conversation History

NOTE: The object that is being stored in CPM User's Message Storage Server and the device local storage, SHALL be according to the data format as described in section 5.2 "*Storage Objects*" in [OMA-CPM_TS_MessageStorage]

8.5.1 Record CPM Standalone Message

Upon receiving a SIP MESSAGE request, the CPM Participating Function:

1. If the SIP MESSAGE request is not for disposition notification as defined in [RFC5438], continue with the rest of steps.

2. SHALL request to store the complete message including all the header fields and bodies of the SIP MESSAGE request to Message Storage Server as described in section 6.3 "*Message and History Operations*" in [OMA-CPM_TS_MessageStorage];

3. SHALL retrieve the information (e.g. UID) of stored messages from Message Storage Server as described in section 6.3 "*Message and History Operations*" in [OMA-CPM_TS_MessageStorage];

Upon receiving a SIP INVITE request, the CPM Participating Function:

1. SHALL extract relevant headers of the request:

   a. From header;

   b. To header;

   c. Date header, if it exists;

   d. Conversation Identity and Contribution Identity and if there is, Contribution Identity being replied to.

After receiving an MSRP SEND request, the CPM Participating Function:

1. SHALL wait until all chunks of the message have been received via subsequent MSRP SEND requests and SHALL reassemble the CPM Standalone Message from these chunks;

2. SHALL send a request to store the CPM Standalone Message including all headers and headers extracted from the SIP INVITE or SIP REFER request as described in section 6.3 "*Message and History Operations*" in [OMA-CPM_TS_MessageStorage];

3. SHALL receive the information (e.g. UID) of stored messages from Message Storage as described in section 6.3 "*Message and History Operations*" in [OMA-CPM_TS_MessageStorage].

8.5.2   Record CPM Session

The general process of recording a CPM Session is as follows: the CPM Participating Function SHALL extract and store locally the content received through the signaling plane and Media Plane during the CPM Session. Upon receiving new content (i.e. during live recording), or latest at termination of the CPM Session, the CPM Participating Function SHALL create messages formatted according to [RFC2822] corresponding to the received or locally stored content and upload these messages to the Message Storage Server, as described in section 6.3 "*Message and History Operations*" in [OMA-CPM_TS_MessageStorage].

Upon receiving a SIP INVITE or a SIP REFER request whose method is set to INVITE, the CPM Participating Function

1. SHALL extract and locally store the following headers of the request:

    a. From header;

    b. To header;

    c. Date header, if it exists;

    d. Conversation Identity and Contribution Identity and if there is, Contribution Identity being replied to.

2. In addition, if the request includes SDP content describing media streams, the CPM Participating Function MAY extract and locally store some of the SDP attributes associated with those media streams.

Upon receiving an MSRP SEND request, the CPM Participating Function:

1. SHALL wait until all chunks of the CPM Chat Message have been received via subsequent MSRP SEND requests and SHALL reassemble the CPM Chat Message from these chunks.

2. SHALL store the message in the Message Storage Server and retrieve a UID from the Message Storage Server .

8.5.3   Record CPM File Transfer

The general process of recording a CPM File Transfer is as follows: the CPM Participating Function SHALL extract and store locally the content received through the signaling plane and Media Plane during the CPM File Transfer. Upon termination of the CPM File Transfer, the CPM Participating SHALL create a message formatted according to [RFC2822] containing all the locally stored data and upload this message to the Message Storage Server.

Upon receiving a SIP INVITE or a SIP REFER request whose method is set to INVITE, the CPM Participating Function

1. SHALL extract and locally store the following headers of the request:

    a. From header;

    b. To header;

    c. Date header, if it exists;

    d. Conversation Identity and Contribution Identity and if there is, Contribution Identity being replied to.

2. In addition, the CPM Participating Function MAY extract and locally store some of the SDP attributes associated with the files transferred.

Upon receiving an MSRP SEND request, the CPM Participating Function:

1. SHALL wait until all chunks of the file have been received via subsequent MSRP SEND requests and SHALL reassemble the file from these chunks, and,

2. SHALL store the file locally.

Upon termination of the CPM File Transfer, the Participating Function:

1. SHALL construct a CPM File Transfer History object containing the CPM File Transfer information, the received files according to section 5.2.4 *"File Transfer History Object"* of [OMA-CPM_TS_MessageStorage], and,

2. SHALL upload the CPM File Transfer History object to the Message Storage Server and retrieve its UID as described in section 6.3 *"Message and History Operations*" of [OMA-CPM_TS_MessageStorage].

9. Procedures at CPM Controlling Function

The CPM Controlling Function handles incoming requests in the following manner:

- Upon receiving a Pager Mode CPM Standalone Message (i.e. a SIP MESSAGE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.msg' included in the Accept-Contact header), it SHALL handle this Pager Mode CPM Standalone Message as defined in section 9.1.1 "*Pager Mode CPM Standalone Message Handling*".

- Upon receiving a Large Message Mode CPM Standalone Message (i.e. a SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.largemsg' included in the Accept-Contact header), it SHALL handle this Large Message Mode CPM Standalone Message as defined in section 9.1.2 "*Large Message Mode CPM Standalone Message Handling*".

- When the IWF receives a CPM Session Invitation (i.e. a SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' included in the Accept-Contact header), it SHALL handle this CPM Session as defined in section 9.2 "*CPM Group Session Handling*".

- When the IWF receives a CPM File Transfer initiation request (i.e. a SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.filetransfer' included in the Accept-Contact header), it SHALL handle this CPM File Transfer as defined in section 9.3 "*CPM File Transfer Handling*".

9.1 CPM Standalone Message Handling

9.1.1 Pager Mode CPM Standalone Message Handling

Upon receiving a SIP MESSAGE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.msg' included in the Accept-Contact header the CPM Controlling Function:

1. SHALL check if the authenticated originator's CPM Address is an authorized address to use functionalities of the CPM Controlling Function and if not authorized the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "127 Service not authorised" in the response according to the rules and procedures of [RFC3261].

   Otherwise, continue with the rest of the steps;

2. If the CPM Controlling Function requires a specific User Agent version to be supported, the CPM Controlling Function SHALL check the User-Agent header field to determine if the CPM Controlling Function supports the User Agent version and if not, the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "132 Version not supported" according to rules and procedures of [RFC3261].

   Otherwise, continue with rest of the steps;

3. If the Request-URI of the SIP INVITE request is set to the address of the CPM Controlling Function, the CPM Controlling Function:

   a. SHALL check if the SIP MESSAGE request received for a CPM Ad-hoc Group has anonymity requested and whether anonymity is allowed for the authenticated originator's CPM Address. If not allowed, the CPM Controlling Function SHALL return a SIP 403 "Forbidden" error response and SHALL include a Warning header with the warning text set to "119 Anonymity not allowed" in the response according to the rules and procedures of [RFC3261].

      Otherwise, continue with the rest of the steps.

   b. SHALL check if the number of recipients exceeds the maximum allowed by service provider policy. If it does, then the CPM Controlling Function SHALL return a SIP 486 "Busy Here" response and SHALL include a Warning header with the warning text set to "102 Too many recipients" in the response according to the rules and procedures of [RFC3261].

      Otherwise, continue with the rest of the steps;

   c. SHALL check if the MIME resource-list body includes an empty URI list. If the URI list is empty, the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning

header with the warning text set to "129 No destinations" in the response according to the rules and procedures of [RFC3261].

Otherwise, continue with the rest of the steps;

  d.   SHALL fetch the member list contained in MIME <resource-lists> body according to procedures specified in [RFC5365].

4.   Otherwise, the CPM Controlling Function:

  a.   SHALL check if the authenticated originator's CPM Address is authorized to send a CPM Standalone Message to the Pre-defined Group by the group policy. If not authorized the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "127 Service not authorised" in the response according to the rules and procedures of [RFC3261].

Otherwise, continue with the rest of the steps;

  b.   SHALL check if the CPM Pre-defined Group address in the Request-URI exists in [OMA-XDM-Group]. If the CPM Pre-defined Group address does not exist, then the CPM Controlling Function SHALL return a SIP 404 "Not found" response according to the rules and procedures of [RFC3261].

Otherwise, continue with the rest of the steps;

  c.   SHALL check if the CPM Pre-defined Group address in the Request-URI is specified to support the CPM service by evaluating if the <supported-services> element indicates support for the CPM service. If the CPM Pre-defined Group address does not support the CPM service, then the CPM Controlling Function SHALL return a SIP 488 "Not Acceptable" response according to the rules and procedures of [RFC3261].

Otherwise, continue with the rest of the steps;

  d.   SHALL check if the SIP MESSAGE request received for a CPM Pre-defined Group has anonymity requested and whether privacy is allowed for the authenticated originator's CPM Address. Allowing privacy for a specific authenticated originator's CPM Address is defined using <allow-anonymity> element of the CPM Group's authorization rules as specified in [OMA-XDM-Group]. If not allowed, the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "119 Anonymity not allowed" in the response according to the rules and procedures of [RFC3261].

Otherwise, continue with the rest of the steps;

  e.   If the CPM Controlling Function requires a specific User Agent version to be supported, the CPM Controlling Function SHALL check the User-Agent header field to determine if the CPM Controlling Function supports the User Agent version and if not, the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "132 Version not supported" in the response according to rules and procedures of [RFC3261].

Otherwise, continue with rest of the steps;

  f.   SHALL check if the Request-URI identifies a CPM Pre-defined Group with empty Group List. If the Group List is empty, the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "129 No destinations" in the response according to the rules and procedures of [RFC3261].

Otherwise, continue with the rest of the steps;

  g.   SHALL retrieve the members belonging to the CPM Pre-defined Group by interacting with [OMA-XDM-Group].

5.   SHALL send a SIP MESSAGE request towards each CPM Group member, the CPM Controlling Function;

  a.   SHALL generate a SIP MESSAGE request according to the rules and procedures of [RFC3428];

  b.   SHALL copy the values in Accept-Contact header from the received SIP MESSAGE request in the outgoing SIP MESSAGE request, if any Accept-Contact header was received;

  c.   SHALL set the Request-URI to the CPM Address or non-CPM Address of the CPM Group member;

    d.   If the received SIP MESSAGE request was sent to a CPM Ad-hoc Group, the CPM Controlling Function SHALL include in the authenticated originator's CPM Address, the address of the sending CPM User;

    e.   If the received SIP MESSAGE request was sent to a CPM Pre-defined Group, the CPM Controlling Function SHALL include the authenticated originator's CPM Address with the following clarification:

        i.   SHALL set the authenticated originator's CPM Address to the CPM Pre-defined Group address;

        ii.   If privacy was requested by the sending CPM User, the CPM Controlling Function SHALL include a Referred-By header with anonymous URI;

        iii.   Otherwise, SHALL include a Referred-By header with the authenticated originator's CPM Address of the received SIP INVITE request.

    f.   SHALL include a User-Agent header to indicate the OMA CPM release version of the CPM Controlling Function as specified in Appendix D "Release Version in User-agent and Server headers";

    g.   SHALL include all the other received SIP headers as well as the body of the received SIP MESSAGE request in each outgoing SIP MESSAGE request;

    h.   SHALL send the SIP MESSAGE request towards the SIP/IP core according to the rules and procedures of the SIP/IP core.

6.   SHALL send a SIP 202 "Accepted" response along the Signalling Path according to [RFC3261].

If an error response is received when attempting to deliver the SIP MESSAGE request to a CPM Address, the CPM Controlling Function SHALL check service provider policies to determine if interworking is allowed, and if it is, SHALL send the CPM Standalone Message request to the ISF as described in section 6.5 "*Communicating with the ISF*".

CPM Standalone Messages with a request for disposition notifications are additionally handled according to section 9.1.3 "*Disposition Notification*".

9.1.2   Large Message Mode CPM Standalone Message Handling

Upon receiving an initial SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.largemsg' corresponding to Large Message Mode CPM Standalone Message included in the Accept-Contact header, the CPM Controlling Function:

1.   SHALL check the authenticated originator's CPM Address and authorize the request, and if not authorized, the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "127 Service not authorised" in the response according to the rules and procedures of [RFC3261];

   Otherwise, continue with rest of the steps;

2.   If the CPM Controlling Function requires a specific User Agent version to be supported, the CPM Controlling Function SHALL check the User-Agent header field to determine if the CPM Controlling Function supports the User Agent version and if not, the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "132 Version not supported" in the response according to the rules and procedures of [RFC3261].

   Otherwise, continue with rest of the steps;

3.   If the Request-URI of the SIP INVITE request is set to the address of the CPM Controlling Function, the CPM Controlling Function:

    a.   SHALL check if the SIP INVITE request received for a CPM Ad-hoc Group has anonymity requested and whether anonymity is allowed as per the service provider's policy. If not allowed, the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "119 Anonymity not allowed" in the response according to the rules and procedures of [RFC3261];

       Otherwise, continue with the rest of the steps;

    b.   SHALL check from the MIME <resource-lists> body that the maximum number of receivers allowed in a CPM Ad-hoc Group is not exceeded. If exceeded, the CPM Controlling Function SHALL return a SIP 486

"Busy Here" response and SHALL include a Warning header with the warning text set to"102 Too many participants" in the response according to the rules and procedures of [RFC3261].

Otherwise, continue with the rest of the steps;

c.   SHALL check if the MIME <resource-lists> body includes an empty URI list. If the URI list is empty, the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "No destinations" in the response according to the rules and procedures of [RFC3261].

Otherwise, continue with the rest of the steps;

d.   SHALL fetch the member list contained in MIME <resource-lists> body according to procedures specified in [RFC5366].

4.   Otherwise, the CPM Controlling Function:

a.   SHALL check that the CPM Pre-defined Group address in the Request-URI, identifying a CPM Pre-defined Group as defined in [OMA-XDM-Group], is specified to support the CPM service by evaluating if the <supported-services> element indicates support for the CPM service. If the CPM service is not supported then the CPM Controlling Function SHALL return a SIP 404 "Not found" response according to the rules and procedures of [RFC3261].

Otherwise, continue with the rest of the steps;

b.   SHALL check if anonymity is requested and whether anonymity is allowed for the authenticated originator's CPM Address. Allowing anonymity for a specific authenticated originator's CPM Address is defined using <allow-anonymity> element of the CPM Group's authorization rules as specified in [OMA-XDM-Group]. If not allowed, the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "119 Anonymity not allowed" in the response according to the rules and procedures of [RFC3261].

Otherwise, continue with the rest of the steps;

5.   If the "Session-Expires" header is included, the CPM Controlling Function SHOULD handle the header according to procedures of [RFC4028];

6.   SHALL behave as a B2BUA according to the rules and procedures of [RFC3261] for the duration of the SIP session;

7.   SHALL send a SIP INVITE request towards each CPM Group member as follows:

a.   SHALL generate a SIP INVITE request according to the rules and procedures of [RFC3261];

b.   SHALL copy the values in Contact header and Accept-Contact header from the received SIP INVITE request in the outgoing SIP INVITE request;

c.   SHALL set the Request-URI to the CPM Address or non-CPM Address of the CPM Group member;

d.   SHALL insert in the Contact header the URI identifying its own address, including the "isfocus" feature parameter;

e.   SHOULD include the Session-Expires header with the refresher parameter set to 'uas' according to the rules and procedures of [RFC4028];

f.   SHALL include the Supported header set to "timer";

g.   SHALL include a User-Agent header to indicate the OMA CPM release version of the CPM Controlling Function as specified in Appendix D "*Release Version in User-agent and Server headers*";

h.   SHALL copy the values of the Privacy header from the received SIP INVITE request received in the outgoing SIP INVITE request, if any Privacy header was received;

i.   SHALL copy the MIME SDP body from the received SIP INVITE request in the outgoing SIP INVITE request as an SDP offer according to the rules and procedures of [RFC3264], [RFC4566], [RFC4975], [RFC6135] and [draft-ietf-simple-msrp-sessmatch] with the following clarifications:

i.   SHALL include a media line proposing MSRP media parameters;

> ii. SHALL include its own MSRP URI for the MSRP connection setup as a=path:MSRP URI;
>
> iii. SHALL set the SDP directional media attribute to a=sendonly;
>
> iv. SHALL set the size as a=file-selector:size:actual message size.
>
> v. SHALL set a=setup attribute as "active".

j. If the received SIP INVITE request was sent to a CPM Ad-hoc Group, the CPM Controlling Function SHALL include the authenticated originator's CPM Address as specified in section 6.1 "*Authenticated Originator's CPM Address*" with the following clarifications:

> i. The URI in the authenticated originator's CPM Address SHALL be set to the CPM Group Session Identity for this particular CPM Ad-hoc Group assigned by the CPM Controlling Function, according to [RFC5366];
>
> ii. SHALL include a Referred-By header with the authenticated originator's CPM Address of the sending CPM User, unless privacy was requested by the sending CPM User, and in that case it SHALL include an anonymous URI in the Referred-By header.

k. If the received SIP INVITE request was sent to a CPM Pre-defined Group, the CPM Controlling Function SHALL include the authenticated originator's CPM Address as specified in section 6.1 "*Authenticated Originator's CPM Address*" with the following clarifications:

> i. SHALL set the authenticated originator's CPM Address to the CPM Pre-defined Group address;
>
> ii. SHALL include a Referred-By header with the authenticated originator's CPM Address of the received SIP INVITE request, or SHALL include a Referred-By header with anonymous URI, if privacy was requested by the sending CPM User.

l. SHALL send the SIP INVITE request to SIP/IP core according to the rules and procedures of the SIP/IP core.

Upon receiving the first SIP 200 "OK" response, the CPM Controlling Function:

1. SHALL generate SIP 200 "OK" response for the received SIP INVITE request according to the rules and procedures of [RFC3261];

2. SHALL include the SDP received in the response of SIP INVITE request as an answer SDP according to the rules and procedures of [RFC3264], [RFC4566], [RFC4975], [RFC6135] and [draft-ietf-simple-msrp-sessmatch] with the following clarifications:

> a. SHALL include a media line proposing MSRP media parameters;
>
> b. SHALL include its own MSRP URI for the MSRP connection setup as a=path:MSRP URI;
>
> c. SHALL set the SDP directional media attribute to a=recvonly;
>
> d. SHALL set the a=setup attribute as "passive".

3. SHALL include a Server header to indicate the OMA CPM release version of the CPM Controlling Function as specified in Appendix D "*Release Version in User-agent and Server headers*";

4. SHALL include a URI identifying its own address in the Contact header;

5. SHALL send the SIP 200 "OK" response according to the rules and procedures of SIP/IP core.

Upon receiving a SIP CANCEL request, the CPM Controlling Function:

1. SHALL act as UAS to handle the SIP CANCEL request according to the rules and procedures of [RFC3261]; and,

2. SHALL act as UAC to cancel the SIP INVITE request towards each CPM Pre-defined Group member via the SIP/IP core according to the rules and procedures of [RFC3261].

Upon receiving a SIP ACK request, the CPM Controlling Function:

1. SHALL forward the SIP ACK request towards each CPM Group member that sent a SIP 200 "OK" response according to the rules and procedures of SIP/IP core.

2. SHALL initiate an MSRP session with each CPM Group Member that sent a SIP 200 "OK" response as follows:

    a.   The CPM Controlling Function SHALL act as an MSRP client for sending MSRP SEND requests according to [RFC6135];

    b.   The CPM Controlling Function SHALL act as an "active" endpoint to open the transport connection according to[RFC6135] ;

    c.   The CPM Controlling Function SHALL establish the MSRP connection according to the MSRP connection parameters in the SDP answer received from each CPM Group member in the SIP 200 "OK" respons according to [RFC4975].

Upon receiving an MSRP SEND request, the CPM Controlling Function:

1. SHALL generate and send an MSRP 200 OK response to the MSRP SEND request;

2. SHALL duplicate the MSRP SEND request for each CPM Group member with the following modifications according to the rules and procedures of [RFC4975]:

    NOTE: The CPM Controlling Function may have to store the received MSRP SEND request to be able to deliver it to the CPM Group members.

    a.   SHALL modify the To-Path header according to the MSRP URI(s) received in the answer SDP from the CPM Group member in accordance with rules and procedures of [draft-ietf-simple-msrp-sessmatch];

    b.   SHALL modify the From-Path header to the CPM Controlling Function's own MSRP URI, according to the rules and procedures of [draft-ietf-simple-msrp-sessmatch].

3. SHALL send the MSRP SEND requests towards each CPM Group member (both CPM Users and/or non-CPM Principals) via the established MSRP connections.

Upon receiving a SIP BYE request from the sending CPM User, the CPM Controlling Function:

1. SHALL respond to the SIP BYE request as described in [RFC3261];

2. SHALL send a SIP BYE request towards each CPM Group member; and

3. SHALL release the resources related to the CPM Group Session.

Upon receiving an error response indicating a failure to deliver the SIP INVITE request or an MSRP SEND request to a CPM Address, the CPM Controlling Function SHALL check service provider policies to determine if interworking is allowed, and if it is, SHALL send the SIP INVITE request to the ISF as described in section 6.5 "*Communicating with the ISF*".

CPM Standalone Messages with a request for disposition notifications are additionally handled according to section 9.2.15 "*Disposition Notification*".

9.2   CPM Group Session Handling

Each CPM Group Session is identified by a CPM Group Session Identity, as described in [RFC4579] to identify the conference URI associated with the CPM Group Session.

9.2.1   CPM Group Session Initiation

Upon receiving an initial SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' included in the Accept-Contact header, the CPM Controlling Function SHALL check if the feature tag is supported. If it is not, the CPM Controlling Function SHALL reject the SIP INVITE with a SIP 403 "Forbidden" response and a Warning header field with the warning text set to "122 Function not allowed" in the response according to the rules and procedures of [RFC3261]. Otherwise, the CPM Controlling Function:

1. SHALL check whether the authenticated originator's CPM Address is of a CPM User that is allowed to send the request and if not, the CPM Controlling Function SHALL returna SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "127 Service not authorized" in the response according to the rules and procedures of [RFC3261].

    Otherwise, continue with rest of the steps;

2. SHALL check the presence of the "isfocus" feature parameter in the URI of the Contact header and if it is present then the CPM Controlling Function SHALL reject the request with a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "105 isfocus already assigned" in the response according to the rules and procedures of [RFC3261].

3. SHALL check if the SDP parameters in the SDP offer are allowed and supported by the CPM Controlling Function according to service provider policy. If the received SDP parameters are not allowed, the CPM Controlling Function SHALL return a SIP 488 "Not Acceptable here" with a description of the supported SDP parameters by the CPM Controlling Function.

   i. SHALL check if the SDP attribute *a=chatroom* defined in **Error! Reference source not found.** with the CPM reserved chat-token value of '*org.openmobilealliance.groupchat.closed*' to indicate that a CPM Closed Group Session is present, i.e. the SDP attribute value "*a=chatroom:org.openmobilealliance.groupchat.closed*". If set, or even if not set but the service provider policies mandate that the CPM Group Session is Closed, the CPM Controlling Function SHALL handle it as a Closed CPM Group Session.

   ii. Otherwise continue with the rest of the steps;

4. If the Request-URI of the SIP INVITE request is set to the address of the CPM Controlling Function, the CPM Controlling Function:

   a. SHALL check if the SIP INVITE request received for a CPM Ad-hoc Group has anonymity requested and whether anonymity is allowed by service provider policy. If not allowed, the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "119 Anonymity not allowed" in the response according to the rules and procedures of [RFC3261].

   Otherwise, continue with the rest of the steps;

   b. SHALL check from the MIME resource-lists body that the maximum number of Participants allowed in a CPM Ad-hoc Group is not exceeded. If exceeded, the CPM Controlling Function SHALL return a SIP 486 "Busy Here" response and SHALL include a Warning header with the warning text set to "102 Too many participants" in the response according to the rules and procedures of [RFC3261].

   Otherwise, continue with the rest of the steps;

   c. SHALL check if the MIME resource-list body includes an empty URI list. If the URI list is empty, the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "129 No destinations" in the response according to the rules and procedures of [RFC3261].

   Otherwise, continue with the rest of the steps;

   d. SHALL fetch the member list contained in MIME <resource-lists> body according to procedures specified in [RFC5366]. This list is used as the set of CPM Group members that have to be invited to the CPM Group Session;

5. Otherwise, the CPM Controlling Function:

   a. SHALL check that the CPM Pre-defined Group address in the Request-URI, identifying a CPM Pre-defined Group as defined in [OMA-XDM-Group], is specified to support the CPM service by evaluating if the <supported-services> element indicates support for the CPM service. If the CPM service is not supported then the CPM Controlling Function SHALL return a SIP 404 "Not found" response" according to the rules and procedures of [RFC3261].

   Otherwise, continue with the rest of the steps;

   b. SHALL check if the SIP INVITE request received for a CPM Pre-defined Group has anonymity requested and whether privacy is allowed for the authenticated originator's CPM Address. Allowing privacy for a specific authenticated originator's CPM Address is defined using <allow-anonymity> element of the CPM Group's authorization rules as specified in [OMA-XDM-Group]. If not allowed, the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the

warning text set to "Anonymity not allowed" in the response according to the rules and procedures of [RFC3261].

Otherwise, continue with the rest of the steps;

c. SHALL determine if the authenticated originator's CPM Address is allowed the action <allow-initiate-conference> as specified in [OMA-XDM-Group]. If the policy does not allow session initiation or if the requested CPM Feature Tag is not supported by the CPM Controlling Function, then the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "122 Function not allowed" in the response according to the rules and procedures of [RFC3261];

Otherwise, continue with the rest of the steps.

d. SHALL validate that the media parameters are acceptable for the CPM Pre-defined Group. If not acceptable, then the CPM Controlling Function SHALL reject the request with a SIP 488 "Not Acceptable Here" response according to the rules and procedures of [RFC3261].

Otherwise, continue with the rest of the steps;

e. SHALL check if a CPM Group Session is active for the CPM Pre-defined Group. If there is already an active CPM Group Session, then the CPM Controlling Function SHALL process the request as described in section 9.2.3 "*Participant Joining a CPM Group Session*".

Otherwise, continue with the rest of the steps;

f. SHALL determine if the members of the CPM Pre-defined Group have to be invited to the CPM Group Session by checking if the value of the <invite-members> element is 'true'. If the value is set to 'true', then use the members of the CPM Pre-defined Group as the set of CPM Group members that have to be invited to the CPM Group Session.

6. SHALL use the display name described in section 6.3 "*Display Name*";

7. SHALL establish a CPM Group Session and allocate a CPM Group Session Identity as described in [RFC4353] and [RFC4579];

8. SHALL invite each of the users listed as the CPM Group members that have to be invited to the CPM Group Session as specified in section 9.2.10 "*Create Session with a Participant*". If a Session-Replaces header (as defined in Appendix C "*CPM-defined SIP Header* fields") is included in one of the entries in the MIME resource-lists body (when the CPM Group Session is set up for a CPM Ad-hoc Group), the CPM Controlling Function SHALL ensure that the header is added into the SIP INVITE request sent to that entry.

In the case that the CPM Group did not have an active CPM Group Session yet, the CPM Controlling Function SHALL handle the responses from the invited group members as follows:

• Upon receiving a SIP final response other than 2xx from an invited CPM Group member, the CPM Controlling Function SHALL remove the inviting CPM Group member from the CPM Group Session as specified in section 9.2.11 "*Participant Removing Request*".

• When all invited group members have responded with a SIP final response other than 2xx, the CPM Controlling Function SHALL send an error response along the incoming signalling path.

• Upon receiving the first SIP 200 "OK" response for the SIP INVITE request from one of the invited group members, the CPM Controlling Function:

1. SHALL generate a SIP 200 "OK" response to the SIP INVITE request according to the rules and procedures of [RFC3261] with the following clarifications:

a. SHALL include the Session-Expires header with the refresher parameter set to 'uac' and start supervising the SIP Session according to the rules and procedures of [RFC4028];

b. SHALL include the CPM Group Session Identity with the feature-tag 'isfocus' as described in [RFC4579] and the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' corresponding to CPM Session in the Contact header;

    c.   SHALL include a User-Agent header to indicate the OMA CPM release version of the CPM Controlling Function as specified in Appendix D "*Release Version in User-agent and Server headers*";

    d.   SHALL include the authenticated originator's CPM Address as specified in section 6.1 "*Authenticated Originator's CPM Address*" set to the CPM Controlling Function;

2.   SHALL include in the SIP 200 "OK" response a SDP body as a SDP answer based on the received SDP answer in the SIP 200 "OK" response, as described in section 5.2.1.2 "*SDP Handling at Intermediate Nodes*".

NOTE: Service provider policy determines how to handle the sessions when different participants accept different media types

3.   SHALL send a SIP 200 "OK" response along the incoming signalling path.

4.   SHALL NOT forward any further responses from the remaining group members that had not responded yet.

Upon receiving a SIP ACK request, the CPM Controlling Function:

1.   SHALL forward the SIP ACK request towards all Participants that sent a SIP 200 "OK" response.

2.   SHALL initiate the Media Plane as in section 9.2.12 "*Media Plane Handling*".

9.2.2   Session Cancellation Request

When the CPM Controlling Function receives a SIP CANCEL request from the originator to cancel a CPM Group Session and before it has received a SIP final response from any one of the Participants yet, the CPM Controlling Function SHALL cancel all SIP INVITE requests it sent out according to the rules and procedures of [RFC3261]. When the CPM Controlling Function has received at least one SIP final response from any of the invited Participants, it SHALL ignore the SIP CANCEL request.

9.2.3   Participant Joining a CPM Group Session for a CPM Pre-defined Group

Upon receiving an initial SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' included in the Accept-Contact header, that includes a CPM Pre-defined Group address in the Request-URI, which identifies the CPM Pre-defined Group that is owned by the CPM Controlling Function and it has been determined (as per procedure in section 9.2.1 "*CPM Group Session Initiation*") that the sender of the SIP INVITE request is joining an already existing CPM Group Session for a CPM Pre-defined Group, the CPM Controlling Function

1.   SHALL determine if the authenticated originator's CPM Address is allowed by the <join-handling> action of the Group's authorization rules as specified in [OMA-XDM-Group] and if not, then the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "127 Service not authorised" in the response according to the rules and procedures of [RFC3261];

Otherwise, continue with the rest of the steps*;*

2.   SHALL accept the SIP request and generate a SIP 200 "OK" response to the SIP INVITE request as follows:

    a.   The CPM Controlling Function SHALL include the stored CPM Conversation Identity, CPM Contribution Identity and, if stored, the CPM Contribution being replied to in the headers defined in Appendix C "*CPM-defined SIP Header* fields" in the SIP 200 "OK" response;

    b.   The CPM Controlling Function SHALL include a SDP body in the SIP 200 "OK" response as a SDP answer as described in section 5.2.1.2 "*SDP Handling at Intermediate Nodes*";

    c.   The CPM Controlling Function SHALL include in the 'accept types' SDP media attribute the selected 'mime types' supported by the CPM Controlling Function from those contained in the SDP offer in the incoming SIP INVITE request.

Upon receiving a SIP ACK request, the CPM Controlling Function:

1.   SHALL initiate the Media Plane as described in section 9.2.12 "*Media Plane Handling*" for this Participant;

2. SHALL send a notification to the Participants that have subscribed to the Participant information, that a CPM User has joined in the CPM Group Session, as specified in section 9.2.14.2 "*Sending Participant Information Notifications*".

9.2.4 Rejoining CPM Group Session Request

Upon receipt of a SIP INVITE request that includes an Accept-Contact header with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' and a CPM Group Session Identity in the Request-URI, the CPM Controlling Function:

1. SHALL check whether this CPM Group Session Identity exists for an active CPM Group Session, or for an inactive CPM Group Session that was previously handled by the CPM Controlling Function (i.e. a CPM Long-lived Group Session). If it does not exist, the CPM Controlling Function SHALL return a SIP 404 "Not Found" response and SHALL include a Warning header with the warning text set to "123 Session does not exist" in the response according to the rules and procedures of [RFC3261].

   Otherwise, continue with the rest of the steps*;*

2. SHALL check whether the Conversation-ID in the INVITE request matches the one stored for the CPM Group Session of the existing CPM Group Session Identity, either active or inactive. If it does not match, the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header field with the warning text set to "122 Function not allowed" in the response according to the rules and procedures of [RFC3261].

Otherwise, continue with the rest of the steps*;*

3. SHALL check CPM Group rules as specified in [OMA-XDM-Group] whether the authenticated originator's CPM Address of the joining CPM User is allowed to join. If it is not allowed to join the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "122 Function not allowed" in the response according to the rules and procedures of [RFC3261].

4. SHALL check the CPM Group Session rules (e.g. metadata and policies) for a Long-lived CPM Group Session and/or for Closed CPM Group Session, whether the authenticated originator's CPM Address of the joining CPM User is allowed to join (by checking the service provider policies for the CPM User, and by checking the last participants list to ensure that the CPM user is among the participants for the case of inactive CPM Long-lived Group Session or for the case of CPM Closed Group Session). If it is not allowed to join the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "122 Function not allowed" in the response according to the rules and procedures of [RFC3261].

   Otherwise, continue with the rest of the steps;

5. SHALL, in the case of a CPM Group Session for a CPM Pre-defined Group, check if the <max-participant-count> as specified in [OMA-XDM-Group] is already reached. If reached, the CPM Controlling Function SHALL return a SIP 486 "Busy Here" response and SHALL include a Warning header with the text set to "102 Too many participants" in the response according to the rules and procedures of [RFC3261].

   Otherwise, continue with the rest of the steps;

6. SHALL use the display name, if a display name is included, according to the priority specified in section 6.3 "*Display Name and Anonymity*";

7. SHALL accept the SIP request and generate a SIP 200 "OK" response;

8. SHALL include the stored CPM Conversation Identity, CPM Contribution Identity and InReplyTo-Contribution-ID in the SIP 200 "OK" response;

9. SHALL send the SIP 200 "OK" response according to the rules and procedures of SIP/IP core;

10. If the re-join request re-starts an inactive CPM Long-lived Group Session, the CPM Controlling Function SHALL use the CPM Group Session rules (e.g. metadata and policies) for a Long-lived CPM Group Session and/or for Closed CPM Group Session, to determine which participants have to be invited to the re-started CPM Long-lived Group Session and the type of CPM Group Session, then send out the invitations as per step 8 in sect. 9.2.10 "*Create Session With a Participant* ".

11. SHALL generate and send a SIP NOTIFY request to the CPM Clients and/or CPM Participating Functions, which have subscribed to the Participant Information as specified in section 9.2.14.2 "*Sending Participant Information Notifications*".

Upon receiving a SIP ACK request, the CPM Controlling Function SHALL initiate the Media Plane as specified in section 9.2.12 "*Media Plane Handling*" for this CPM Client.

9.2.5 Adding Participants Request

CPM SIP REFER requests are sent within the scope of the CPM Session dialog to which they are related. Upon receiving a SIP REFER request that includes an Accept-Contact header with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' and the "method" parameter set to "INVITE" in the Refer-To header, the CPM Controlling Function:

1. SHALL if the Refer-Sub header is not present or is set to "true" in the SIP REFER request, generate and send a SIP 421 "Extension Required" response including a Require header with the option tag "norefersub".

2. In case of CPM Pre-defined Group, SHALL perform actions to verify that the authenticated originator's CPM Address of the inviting CPM User is allowed to invite other users by checking the <allow-invite-users-dynamically> action as specified in [OMA-XDM-Group] and if not authorized, the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "127 Service not authorised" in the response according to the rules and procedures of [RFC3261];

3. In case of a CPM Ad-hoc group: it SHALL check the type of CPM Group Session, and if it is a Closed CPM Group Session it SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "127 Service not authorised" in the response according to the rules and procedures of [RFC3261].

   Otherwise, continue with the rest of steps;

4. SHALL check whether privacy is allowed for the authenticated originator's CPM Address, when anonymity is requested with the Privacy header containing the tag 'id'. If not allowed, the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "119 Anonymity not allowed" in the response according to the rules and procedures of [RFC3261].

   Otherwise, continue with the rest of steps;

5. SHALL extract the address(es) of the users from the SIP REFER request to be invited either:

   a. from the Refer-To header according to the rules and procedures of [RFC3515] for inviting one user; or

   b. from the MIME resource-list body according to the rules and procedures of [RFC5368] for inviting multiple users.

6. SHALL generate a SIP 202 "Accepted" final response to the SIP REFER request according to the rules and procedures of [RFC3515];

7. SHALL include in the response to the SIP REFER request a Refer-Sub header set to "false" according to the rules and procedures of [RFC4488];

8. SHALL include in the response to the SIP REFER request a Supported header with the option tag "norefersub" according to the rules and procedures of [RFC4488];

9. SHALL follow the actions described in section 9.2.10 "*Create Session with a Participant*" for each address.

9.2.6 Removing Participant Request

CPM SIP REFER requests are sent within the scope of the CPM Session dialog to which they are related. Upon receiving a SIP REFER request that includes an Accept-Contact header with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' and the "method" parameter set to "BYE" in the Refer-To header, the CPM Controlling Function:

1. SHALL if the Refer-Sub header is not present or is set to "true" in the SIP REFER request, generate and send a SIP 421 "Extension Required" response including a Require header with the option tag "norefersub".

2. In case of CPM Pre-defined Group, SHALL perform actions to verify that the authenticated originator's CPM Address of the CPM User who initiated the request is authorized for the request by checking the <allow-expelling> element as defined in [OMA-XDM-Group] and if not authorized, the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "122 Function not allowed" in the response according to the rules and procedures of [RFC3261].

    Otherwise, continue with the rest of steps;

3. SHALL check whether privacy is allowed for the authenticated originator's CPM Address, when anonymity is requested with the Privacy header containing the tag 'id'. If not allowed, the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "119 Anonymity not allowed" in the response according to the rules and procedures of [RFC3261].

    Otherwise, continue with the rest of steps;

4. SHALL extract the address(es) of the users from the SIP REFER request to be removed either:

    a. from the Refer-To header according to the rules and procedures of [RFC3515] for removing one user; or

    b. from the MIME resource-list body according to the rules and procedures of [RFC5368] for removing multiple users.

5. SHALL generate a SIP 202 "Accepted" response to the SIP REFER request according to the rules and procedures of [RFC3515];

6. SHALL include in the response to the SIP REFER request a Refer-Sub header set to "false" according to the rules and procedures of [RFC4488];

7. SHALL include in the response to the SIP REFER request a Supported header with the option tag "norefersub" according to the rules and procedures of [RFC4488];

8. SHALL follow the actions described in section 9.2.11 "*Participant Removing Request*" for each address;

9.2.7   Session Leaving Request

Upon receiving a SIP BYE request with a Reason header field containing a reason code=200 with text "Call completed", the CPM Controlling Function:

1. SHALL return a SIP 200 "OK" response according to the rules and procedures of the SIP/IP core;

2. SHALL release all Media Plane resources corresponding to the CPM Session being closed;

3. SHALL terminate the subscription to Participant Information of this CPM Group Session if the CPM Client requesting to leave the CPM Group Session has such a subscription;

4. SHALL check CPM Group Session release policy as specified below:

    a. if a CPM Group Session for a CPM Pre-defined Group or a CPM Ad-hoc Group has as many as or less than specified Participants left the CPM Controlling Function SHALL remove any remaining Participant from the CPM Session according to Section 9.2.11 "*Participant Removing Request*" and release the CPM Session. The possible values should be 0 or 1.

    b. If the CPM Session is an CPM Group Session for a CPM Ad-hoc Group and the originator of the CPM Session leaves the CPM Session then the CPM Controlling Function SHALL remove the rest of the Participants from the CPM Session it hosts according to Section 9.2.11 "*Participant Removing Request*" and release the CPM Session;

5. if Long-lived CPM Group Session is supported as per service provider policies, the CPM Controlling Function SHALL keep locally the information of the Group State Object (including the type of CPM Group Session i.e. Closed, and the list of participants).

If there is on-going CPM File Transfer initiated in the CPM Group Session, the termination of the CPM Group Session SHALL not terminate the on-going CPM File Transfer for the CPM Participants in the CPM Group Session, and vice versa.

9.2.8 CPM Group Session Modification

Upon receiving a SIP re-INVITE request (i.e. an INVITE request with an existing session-id in the Request-URI, including a new SDP offer) the CPM Controlling Function:

1. SHALL validate that the new media parameters in the SIP re-INVITE request are acceptable by the CPM Controlling Function according to service provider policy. If not acceptable SHALL returna SIP 488 "Not Acceptable Here" response according to the rules and procedures of [RFC3261].

   Otherwise, continue with the rest of the steps;

2. In case the CPM Group Session has been established on behalf of a CPM Pre-defined Group, SHALL perform actions to verify that the authenticated originator's CPM Address of the CPM User who initiated the request is authorized for the request by checking the <allow-media-handling> element as defined in [OMA-XDM-Group] according to CPM Pre-defined Group policy. If not authorized, the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include a Warning header with the warning text set to "122 Function not allowed" in the response according to the rules and procedures of [RFC3261].

   Otherwise, continue with the rest of steps;

3. SHALL send a session modification request to the other Participants of the CPM Group Session. The CPM Controlling Function:

   a. SHALL generate a SIP re-INVITE request according to the rules and procedures of [RFC3261];

   b. SHALL include a MIME SDP body based on the received SDP offer, as described in section 5.2.1.2 "*SDP Handling at Intermediate Nodes*";

   c. SHALL send the SIP re-INVITE request towards the CPM Group Session Participants according to the rules and procedures of SIP/IP core.

4. SHALL determine based on service provider policy the minimum number of Participants that must accept the session modification in order to allow the modification to proceed:

   a. If enough Participants have agreed to the session modification, SHALL generate a SIP 200 "OK" response as follows:

      i. Include a MIME SDP body as a SDP answer as described in section 5.2.1.3 "*SDP Handling at Terminating Nodes*" ; and,

      ii. Send the SIP 200 "OK" response to the SIP/IP core along the signalling path.

   b. If not enough Participants have accepted the session modification, SHALL send a 488 "Not Acceptable Here" response and send a SIP re-INVITE request to those Participants that had accepted the session modification, in order to bring the session back to the original session media parameters.

   NOTE: Service provider policy determines how to handle the sessions when different participants accept different media types.

Upon receiving a SIP ACK request, the CPM Controlling Function SHALL modify the Media Plane for all CPM Group Session Participants who accepted the CPM Session modification as specified in section 9.2.12 "*Media Plane Handling*";

9.2.9 Group Session Ending Request

When the CPM Controlling Function finds that the CPM Group Session SHOULD be released based on the CPM release policy described below, the CPM Controlling Function SHALL remove all the Participants in the CPM Group Session as specified in section 9.2.11 "*Participant Removing Request*" , with the following clarifications:

- If the number of participants is smaller than the minimum number required for a CPM Group Session, then the Controlling Function SHALL indicate this by including a Reason header field with a value set to *SIP;cause=410;* and MAY have a text parameter containing an explanatory String (e.g. "Gone", or other) in the SIP BYE request that it sends to the remaining participants, to indicate that the CPM Group Session Identity no longer exists;

- If the CPM Group Session inactivity timer was reached, the Controlling Function SHALL include a Reason header field with a value set to *SIP;cause=480;* and MAY have a text parameter containing an explanatory String

(e.g.*"Bearer unavailable", or other)* in the SIP BYE request that it sends to the current participants, indicating to the CPM Clients that the CPM Group Session can re-started as a CPM Long-lived group Session.

.

The CPM Controlling Function SHALL support the following operator configurable variables as defined in [OMA-XDM-Policy] together with the possible values shown in parentheses:

auto-release (true/false)

1. When the initiator leaves the CPM Session and auto-release is true the CPM Controlling Function SHALL remove the rest of the Participants from the CPM Group Session for a CPM Pre-defined Group and release the CPM Session;

2. If false the CPM Controlling Function SHALL NOT remove the rest of the Participants from the CPM Group Session for a CPM Pre-defined Group nor release the CPM Group Session when the initiator leaves the CPM Session.

session-max-length (seconds)

1. If the CPM Group Session has lasted the specified amount of seconds the CPM Controlling Function SHALL release the CPM Group Session.

number-of-remaining-participants (0/1)

1. If a CPM Group Session for a CPM Pre-defined Group or a CPM Ad-hoc Group has as many as or less than the specified Participants left the CPM Controlling Function SHALL release the CPM Group Session. The possible values are 0 or 1.

   NOTE: Service provider policy defines the values of these variables for CPM Ad-Hoc Group Sessions.

The release policy SHALL include the following:

1. The CPM Controlling Function SHALL remove the rest of the Participants from the CPM Group Session it hosts and release the CPM Group Session:

    a. If the CPM Group Session is an Ad-hoc Group Session and the initiator of the CPM Group Session leaves according to service provider policy;

    b. If the CPM Group Session is a CPM Pre-defined Group Session and the initiator of the CPM Group Session leaves and the auto-release has the value "true";

    c. If the CPM Group Session is a CPM Pre-defined or Ad-hoc Group Session and there are as many as or less than the "number-of-remaining-participants" Participants in the CPM Group Session; or

    d. If the CPM Group Session has lasted longer than the session-max-length variable specifies;

9.2.10   Create Session with a Participant

When the CPM Controlling Function needs to set up a session with a CPM Group Session Participant, CPM Controlling Function:

1. SHALL generate an initial SIP INVITE request according to the rules and procedures of [RFC3261] with the following clarifications:

2. SHALL include an Accept-Contact header field with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' if an Accept-Contact header field has been received in the incoming CPM Session Invitation to start the CPM Group Session but does not contain a 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' CPM Feature Tag, according to the rules and procedures of [RFC3841];

3. SHALL copy the values received in each Accept-Contact header field of the incoming CPM Session Invitation to start the CPM Group Session to a corresponding Accept-Contact header field in the SIP INVITE request, if any Accept-Contact header fields are received;

4. SHALL include in the Contact header of the SIP INVITE request as CPM Group Session Identity the contact address of the conference and the CPM feature-tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' and the "isfocus" feature parameter;

5. SHOULD include the Session-Expires header field with the refresher parameter set to 'uas' according to the rules and procedures of [RFC4028];

6. SHALL include the Supported header field set to "timer";

7. SHALL include value 'id' in a Privacy header field according to the rules and procedures of [RFC3325], if anonymity is requested with the "Privacy: id" header field in the incoming CPM Session Invitation to start the CPM Group Session;

8. SHALL include a MIME SDP body as a SDP offer based on the received SDP offer as described in section 5.2.1.2 "*SDP Handling at Intermediate Nodes*"

9. SHALL include the authenticated originator's CPM Address as specified in section 6.1 "*Authenticated Originator's CPM Address*" as follows:

    a. with the URI and Display name set to the CPM Group Session Identity in the case of a CPM Group Session for a CPM Ad-hoc Group Session; or,

    b. with the URI and Display name set to the CPM Pre-defined Group address in the case of a CPM Group Session for a CPM Pre-defined Group;

10. SHALL set the Request-URI to the CPM Address of the Participant to be invited;

NOTE: If the request is extending an existing CPM 1-1 Session to a CPM Group Session, the Request-URI may contain the public GRUU of the CPM Client on which the CPM Session is being extended.

11. SHALL include a Referred-By header field with the authenticated originator's CPM Address present in the incoming CPM Session Invitation to start the CPM Group Session;

12. SHALL include the Conversation-ID, Contribution-ID and InReplyTo-Contribution-ID header fields and values received in the incoming CPM Session Invitation to start the CPM Group Session;

13. MAY include the "Subject" header field associated with the group if it is a CPM Pre-defined Group;

NOTE: The Subject header field of the CPM Pre-defined Group has precedence over the Subject header field received in the incoming CPM Session Invitation to start the CPM Group Session.

14. SHALL send the SIP INVITE request towards the SIP/IP core according to the rules and procedures of the SIP/IP core.

Upon receiving an error response that indicates that the recipient is not a CPM subscriber, e.g. a SIP 488 "Not Acceptable Here" response, the CPM Controlling Function SHALL send the SIP INVITE request to the ISF as described in section 6.5 "*Communicating with the ISF*". Responses coming from the IWF are treated the same way as responses coming from CPM Participants.

Upon receiving SIP 200 "OK" response for the SIP INVITE request the CPM Controlling Function SHALL check whether privacy is allowed in this CPM Group, when anonymity is requested with the Privacy header containing the tag "id". If not allowed, the CPM Controlling Function SHOULD release the CPM Client from the CPM Session immediately as specified in 9.2.11 "*Participant Removing Request*". Allowing privacy in the group is defined using <allow-anonymity> element as specified in [OMA-XDM-Group]. If allowed, provide anonymization according to [RFC3323] and [RFC3325] and continue with the rest of the steps;

Upon receiving a SIP ACK request for the SIP INVITE request the CPM Controlling Function:

1. SHALL interact with the Media Plane as specified in 9.2.12 "*Media Plane Handling*";

2. SHALL send a notification to the CPM Clients, which have subscribed to the Participant information that an invited CPM User has joined in the CPM Group Session, as specified in section 9.2.14.2 "*Sending Participant Information Notifications*".

9.2.11   Participant Removing Request

When a Participant needs to be removed from the CPM Group Session, the CPM Controlling Function SHALL remove the Participant as follows:

If the CPM Controlling Function received a request to remove the Participant, via a SIP REFER request procedure described in sect. 9.2.6. "*Removing Participant Request*", then it:

1. SHALL generate a SIP BYE request with a Reason header field containing SIP;cause=200, according to the rules and procedures of [RFC3261] towards the Participant according to the rules and procedures of the SIP/IP core;

2. SHALL release the Media Plane resources associated with the Participant being removed and keep the Participant in the CPM Group Session Participants Information;

3. Upon receiving a SIP 200 "OK" for the SIP BYE request, the CPM Controlling Function SHALL send a notification to the Participants that have subscribed to the Group Session information, to indicate that a CPM User has left the CPM Group Session, as specified in section 9.2.14.2 "Sending Participant Information Notifications" indicating the value "booted" in the <disconnection-method> associated with that CPM User.

If the CPM Controlling Function received a SIP BYE with Reason header field including a SIP reason with a cause=200, then the CPM Controlling Function SHALL consider the Participant "departed" and it:

1. SHALL send a 200 OK response for the SIP BYE, towards the Participant according to the rules and procedures of the SIP/IP core;

2. SHALL release the Media Plane resources associated with the Participant being removed;

3. SHALL remove the Participant from the CPM Group Session Participants Information;

4. SHALL send SIP NOTIFY to the remaining participants of the chat indicating by the value "departed" in the <disconnection-method> associated with that CPM User.

If the CPM Controlling Function received a SIP BYE with Reason header field including a SIP reason with a cause value different than protocol-cause=200, then the CPM Controlling Function SHALL consider the Participant "booted" and it:

1. SHALL send a 200 OK response towards the Participant according to the rules and procedures of the SIP/IP core;

2. SHALL release the Media Plane resources associated with the Participant and keep the Participant in the CPM Group Session Participants Information;

3. SHALL record the 'booted' disconnection state for the Participant in the Participants Information of the CPM Group Session;

4. SHALL send SIP NOTIFY to the remaining participants of the chat indicating by the value "booted" in the <disconnection-method> associated with that CPM User, with a reason sub-element set to SIP response code *503 <reason>SIP;cause=503;text="Service Unavailable"</reason>*.

   If the CPM Controlling Function received a SIP 603 DECLINED response to a SIP INVITE, then it SHALL remove the Participant that has declined from the Participants list and SHALL notify the remaining participants of an updated conference state. In this conference state event package notification, the CPM Controlling Function SHALL set the departed participant's status to "disconnected" and include the disconnection-method element set to a value of "failed" with a reason sub-element set to code *603 <reason>SIP;cause=603;text="Declined"</reason>*.

9.2.12 Media Plane Handling

The CPM Controlling Function bridges Media Streams for CPM Group Session Participants.

9.2.12.1 Media Plane Handling for MSRP Sessions

The CPM Controlling Function relays MSRP Media Streams between originating network and terminating networks. In general, the CPM Controlling Function:

1. SHALL maintain a MSRP session for each participant who accepted the MSRP session;

2. SHALL distribute received MSRP messages to each participant who accepted the MSRP session.

To establish the MSRP connection, the CPM Controlling Function:

1. SHALL act as MSRP client for sending MSRP SEND request according to [RFC6135];

2. SHALL act as an "active" or "passive" endpoint according to[RFC6135] ; and

3. SHALL establish the MSRP connection towards each participant who accepted the MSRP session according to the MSRP connection parameters in the SDP answer received in the 200 "OK" response according to[RFC6135] ;

Upon receiving an MSRP SEND request, the CPM Controlling Function:

1. SHALL generate and send MSRP 200 OK response to the MSRP SEND request;

2. SHALL duplicate the MSRP SEND request for each CPM Group member with the following modifications according to the rules and procedures of [RFC4975]:

   a. SHALL modify the To-Path header according to the MSRP URI(s) received in the answer SDP from the CPM Group member in accordance with rules and procedures of [RFC4975];

   b. SHALL modify the From-Path header to the CPM Controlling Function's own MSRP URI, according to the rules and procedures of [RFC4975];

3. SHALL send the MSRP SEND requests towards each participant who accepted the MSRP session (both CPM Users and/or non-CPM Principals) excluding the one that sent the MSRP SEND request via established MSRP connections.

9.2.12.2   Media Plane Handling for RTP/RTSP Sessions

The CPM Controlling Function SHALL establish RTP sessions and relay RTP and RTCP packets between originating network and terminating networks according to the rules and procedures of [RFC3550]. In general, the CPM Controlling Function:

1. SHALL maintain a RTP session for each CPM Group member who accepted the RTP session;

2. SHALL relay or distribute received RTP and RTCP to each CPM Group member who accepted the RTP session.

9.2.13   Pseudonyms in a CPM Group Session

The CPM Controlling Function maintains information about Pseudonyms of all the Participants in a session. The purpose is to guarantee that a Pseudonym is unique in a session.

When the CPM Controlling Function receives a SIP INVITE request and the CPM User requests anonymity by adding privacy type "id" to the Privacy header as defined in [RFC3325] or the CPM Controlling Function receives a SIP REFER request that is without a method parameter in the Refer-To header or when the method parameter is set to "INVITE" in the Refer-To header and the CPM User requests anonymity by adding privacy type "id" to the Privacy header as defined in [RFC3325], the CPM Controlling Function SHALL check the 'From' header field values against the entries in the CPM Controlling Function mapping for the session and

1. If the 'From' header field values are unique, the CPM Controlling Function SHALL store the 'From' header field values for the joining User.

2. If the 'From' header field is NOT unique, the CPM Controlling Function SHALL assign a modified/changed values of the 'From' header field to make it unique for the joining User.

   NOTE: When an CPM Controlling Function checks the 'From' header field e.g. <bob><sip: anonymous@anonymous.invalid>" and this field is not unique in the CPM Group Session, then the CPM Controlling Function could modify it to <bob-X><sip:anonymousX@anonymous.invalid>, where X could be any value. This is an example and the exact form of modified Pseudonym is a matter of service provider policy.

If the CPM user is subscribed to the Participant Information notification, the CPM Controlling Function:

1. SHALL insert in the Participant Information destined to the joining User, the modified value of the 'From' header field as the value of the "entity" attribute of the <user> element;

2. SHALL include "yourown" attribute extension with the value "true" to the <user> element.

9.2.14 Participant Information

9.2.14.1 CPM Group Session Participant Information Request

Upon receiving a SIP SUBSCRIBE request with the Event header set to "conference" according to the rules and procedures of [RFC4575], the CPM Controlling Function:

1. SHALL, if the Request-URI contains a CPM Group Session Identity, check whether the CPM Group Session Identity in the Request-URI is owned by the CPM Controlling Function. If not, the CPM Controlling Function SHALL returna SIP 404 "Not found" response;

    Otherwise continue with the rest of the step;

2. SHALL verify the authenticated originator's CPM Address and authorize the request according to CPM Pre-defined Group policy and/or service provider policy and if it is not authorized the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include an Warning header with the warning text set to "127 Service not authorised" in the response according to the rules and procedures of [RFC3261].

    Otherwise, continue with the rest of the steps;

    NOTE: Service provider policy, e.g. number of simultaneous subscriptions exceeded, may cause the CPM Controlling Function to reject the subscription request.

3. In case of CPM Ad-hoc Group, SHALL check if the requesting CPM User is a Participant. If not, the CPM Controlling Function SHALL return a SIP 403 "Forbidden" response and SHALL include an Warning header with the warning text set to "122 Function not allowed" in the response according to the rules and procedures of [RFC3261].

    Otherwise, continue with the rest of the steps;

4. In case of CPM Pre-defined Group, SHALL check whether the authenticated originator's CPM Address is allowed to subscribe to Participant information according to the <allow-conference-state> action as specified in [OMA-XDM-Group] and if user is a Participant in the CPM Group Session. If it is not allowed or if the requesting CPM User is not a Participant, the CPM Controlling Function SHALL returna SIP 403 "Forbidden" response and SHALL include an Warning header with the warning text set to "122 Function not allowed" in the response according to the rules and procedures of [RFC3261].

    Otherwise, continue with the rest of the steps;

5. SHALL create a subscription to the conference state of the CPM Group Session according to the rules and procedures of [RFC3265] and [RFC4575] and SHALL generate a SIP 200 "OK" response to the SIP SUBSCRIBE request according to the rules and procedures of [RFC3265] and [RFC4575];

6. SHALL set the Contact header of the SIP response to the address of the CPM Controlling Function;

7. SHALL send the SIP response according to the rules and procedures of the SIP/IP core;

8. SHALL generate an initial SIP NOTIFY request as specified in section 9.2.14.2 "*Sending Participant Information Notifications*";

9. SHALL send the SIP NOTIFY request to the CPM Client according to the rules and procedure of the SIP/IP core.

When a change in the subscribed state occurs, the CPM Controlling Function SHOULD generate and send a SIP NOTIFY request as specified in section 9.2.14.2 "*Sending Participant Information Notifications*" and according to the rules and procedures of SIP/IP core respectively.

When needed the CPM Controlling Function SHALL terminate the subscription and indicate it to the CPM Client as described in the section 9.2.14.3 "*Terminating the Subscription*".

9.2.14.2   Sending Participant Information Notifications

When the CPM Controlling Function needs to notify a Participant of changes to the Participant Information, it SHALL generate a SIP NOTIFY request according to the rules and procedures of [RFC3265] with the following clarifications:

1. When reporting changes in the Participant information, the CPM Controlling Function SHALL use partial notification according to the rules and procedures of [RFC4575];

2. The CPM Controlling Function SHALL include a MIME application/conference-info+xml body according to the rules and procedures of [RFC4575] with the following limitations:

    a. The CPM Controlling Function SHALL include the CPM Group Session Identity in the <entity> attribute of the <conference-info> element;

    b. The CPM Controlling Function SHALL include a <user> element. The "user" element:

        i. SHALL include the <entity> attribute. The <entity> attribute:

            • SHALL for the originating CPM Client include the authenticated originator's CPM Address of the initial SIP INVITE request, if the Participant has not requested privacy; or,

            • SHALL for the originating CPM Client include the from header, if the Participant has requested privacy; and,

            • SHALL for an invited CPM Client include the identity used in the URI-list for the Invited CPM Client to a CPM Ad-hoc Group Session or the identity used in the CPM Group definition in case of a Predefined Group Session, if the Participant has not requested privacy; or,

            • SHALL for an invited CPM Client include an anonymous identity as specified in [RFC4575], if the Participant has requested privacy;

            • SHALL include, for each Participant receiving the NOTIFY an extension to the <user> element, "yourown" attribute to identify the Participant's own information as defined in Appendix M of [OMA-SIMPLE-IM].

        ii. MAY include the <display-text> element. If include, the <display-text> element SHALL include the Display Name of the identity which was used in the <entity> attribute as defined in step a;

        iii. SHALL include a single <endpoint> element. The <endpoint> element

            • SHALL include the <entity> attribute;

            • SHALL include the <status> element. The <status> element SHOULD have one of the following values:

                a. "connected", when the Participant has joined to the CPM Group Session; or,

                b. "disconnected", when the Participant has left the CPM Group Session since the last SIP NOTIFY request was sent with the following <disconnection-method> element values: "departed", "booted" or "failed".

                c. "pending", when the acceptance of the CPM Group Session invitation was not yet received from the Participant as per RFC4575).

Next, The CPM Controlling Function SHALL send the SIP NOTIFY request according to the rules and procedures of the SIP/IP core.

The CPM Controlling Function SHOULD limit the rate of SIP NOTIFY requests sent towards a Participant.

NOTE: How a CPM Controlling Function limits the rate of SIP NOTIFY requests sent towards the CPM Client is out of scope of this specification.

9.2.14.3   Terminating the Subscription

The CPM Controlling Function:

1. SHALL terminate all subscriptions for Participant information for the CPM Group Session when the CPM Group Session is released and not accept any re-subscriptions;

2. MAY terminate the subscription for an CPM Client when it leaves the CPM Session;

3. For each subscription that shall be terminated the CPM Controlling Function:

    a. SHALL generate a SIP NOTIFY request according to the rules and procedures specified in [RFC3265];

    b. SHALL set the Subscription-State header to "terminated; reason=noresource"; and,

    c. SHALL send the SIP NOTIFY request to the CPM Client according to the rules and procedures of SIP/IP core.

9.2.15 Disposition Notification

When the CPM Controlling Function receives a CPM Standalone Message, or a CPM Chat Message, containing a disposition notification request, the CPM Controlling Function SHALL act as intermediary according to the rules and procedures of [RFC5438] with the following clarifications:

- In case the CPM Controlling Function needs to stay on the path of IMDN to aggregate IMDNs according to service provider policy, it SHALL insert in the CPM Standalone Message, or in the CPM Chat Message, a CPIM IMDN-Record-Route header with its own address;

- The CPM Controlling Function SHALL insert in the CPM Standalone Message, or in the CPM Chat Message, a CPIM Original-To header with the value of the original CPIM To header;

- In case the CPM Controlling Function receives an error response to a CPM Standalone Message, or to the CPM Chat Message, containing a "negative-delivery" notification request, the CPM Controlling Function MAY construct and send a "negative-delivery" notification according to service provider policy.

When staying on the path of IMDN to aggregate IMDNs, upon receiving the initial IMDN, the CPM Controlling Function SHALL await for any remaining IMDNs, aggregate them and send the aggregated IMDN according to rules and procedures of [RFC5438].

9.3 CPM File Transfer Handling

When the CPM Controlling Function receives a SIP INVITE request with the CPM Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.filetransfer', it SHALL execute the processing in section 9.1.2 "*Large Message Mode CPM Standalone Message* ".

NOTE: The SDP for Large Message Mode CPM Standalone Message and CPM File Transfer is different but the processing in the CPM Controlling Function is the same.

9.3.1 CPM File Transfer in Group Session Handling

If File Transfer in CPM Group Session is supported , the CPM Controlling Function receives a SIP INVITE request with CPM File Transfer Feature Tag and with the Request-URI having a value of the CPM Group Session Identity of the on-going active CPM Group Session, it SHALL execute the procedures in section 9.1.2 "Large Message Mode CPM Standalone Message" with the following clarifications:

1. SHALL handle the CPM Participants that did not indicate support for CPM supported MIME types in the *a=accept-wrapped-types* attribute of the SDP answer to the CPM File Transfer SIP INVITE, as per service provider policy; and

2. SHALL not include the recipient-list in the body of the generated INVITE requests (i.e. skip the steps 3 b, c and d, and step 4 in section 9.1.2 "*Large Message Mode CPM Standalone Message* ").

If File Transfer in CPM Group Session is not supported, the CPM Controlling Function receives a SIP INVITE request with CPM File Transfer Feature Tag and with the Request-URI having a value of the CPM Group Session Identity of the on-going active CPM Group Session, it SHALL reject the SIP INVITE request with a SIP 403 "Forbidden" response and SHALL

include a Warning header with the warning text set to "122 Function not allowed" in the response according to the rules and procedures of [RFC3261].

Appendix A.   Change History   (Informative)

A.1   Approved Version History

Reference	Date	Description
n/a	n/a	No prior version

A.2   Draft/Candidate Version 2.0 History

Document Identifier	Date	Sections	Description
Draft Versions OMA-TS-CPM_Conv_Fnct-V2_0	20 Apr 2012	All	Initial Draft with content from v1.0 document
	16 Jul 2012	3.2, 7.3.10.2, 8.3.1.1, 8.3.1.2	Blacklist usage instead of "oma-blocked-contacts"
	15 Aug 2012	2.1, 3.2, 4.2, 5.2, 5.3, 5.4, 5.5, 7, 7.2, 7.5, 8.2, 8.2.4, 8.3.4, 9.1.3, 9.3, Appendix D	CR34R02 incorporated
	25 Sep 2012	4.2, 7.3.9, 7.4, 8.2.3, Appendix F	CR52R01 and CR60R01 incorporated
	06 Nov 2012	7.4, 8.3	CR51R02 and CR67 incorporated
	22 Nov 2012	2.2, 4.2, 5.2, 5.4, 5.5, 5.6, 7.4, 8,2, 8.3, 8.5	CR58R01, CR59R03, CR68R01, CR73R02 and CR74R01 incorporated
	17 Dec 2012	7.3.1.2, 7.3.5, 9.2.1, 9.2.4, 9.2.5, 9.2.7,	Incorporated CR: OMA-COM-CPM-2012-0083R01-CR_TS_Conv_ClosedGC Editorial changes
	22 Jan 2013	7.3.1.5, 7.3.2, 7.3.4, 8.2.2.3, 8.2.2.6, 9.2.4, 9.2.9, 9.2.11, 7.3.11, 8.3.2	Incorporated CR: CR 81R03 (2012). CR 01 (2013) CR 04 (2013) CR 05R01 (2013)
	25 Feb 2013		Comment from CONRR implemented. CRs incorporated: 0008R01, 0011R01, 0012R01, 0014R03, 0016R01, 0022R01, 0024, 0025, 0026, 0027, 0028R01, 0029R01, 0030R01, 0031, 0032
	13 Mar 2013		CRs incorporated: 0033R01, 0035R01, 0036
	04 Apr 2013		CRs incorporated: 0013, 0062, 0078R01, 80R02
	11 Apr 2013		CRs incorporated: 0070R01, 0072
	25 Apr 2013		CRs incorporated: 0069R01, 0071, 0079
	05 May 2013		CRs incorporated: 0068, 0091R01, 0092R02, 0096, 0100R01
	09 May 2013		CRs incorporated: CR0085, CR0081R01, 0089R01, CR0090, CR108R02
	17 May 2013		CRs incorporated: CR103

Document Identifier	Date	Sections	Description
	21 May 2013	2.1, 6.1.2, 7.3.1.2, 7.3.1.5, 8.2.2.1, 9.2.1, C.1.1, C.1.2	Incorporated CRs: OMA-COM-CPM-2013-0107R01-CR_New_reference_for_Conv_ID_and_Contr_ID_action_item OMA-COM-CPM-2013-0112R02-CR_AI020_explicit_require OMA-COM-CPM-2013-0115R01-CR_A021_CR103_Updates OMA-COM-CPM-2013-0117-CR_Conv_TS_Closed_GC_Token OMA-COM-CPM-2013-0121-CR_ConvTS_LLGC_ContributionID_A021 OMA-COM-CPM-2013-0122R01-CR_ConvTS_FT_in_Chat_A022 OMA-COM-CPM-2013-0129R01-CR_CR_Conv_TS_live_recording Editorial changes
	30 May 2013		Incorporated CR: 127R02, 130R01
Candidate Version OMA-TS-CPM_Conv_Fnct-V2_0	11 Jun 2013	n/a	Status changed to Candidate by TP TP Ref # OMA-TP-2013-0163R01-INP_Converved_IP_Messaging_2.0_ERP_and_ETR_Candidate_Approval

Appendix B.   Static Conformance Requirements   (Normative)

The notation used in this appendix is specified in [OMA-SCRRULES].

B.1   SCR for CPM Client

Item	Function	Reference	Requirement
CPM-CF-C-001-M	Registering	7.1	
CPM-CF-C-002-M	Sending a Pager Mode CPM Standalone Message to one recipient	7.2.1.1	
CPM-CF-C-003-M	Sending a Pager Mode CPM Standalone Message to a CPM Ad-hoc Group	7.2.1.1	
CPM-CF-C-004-M	Sending a Pager Mode CPM Standalone Message to a CPM Pre-defined Group	7.2.1.1	
CPM-CF-C-005-M	Sending a Large Message Mode CPM Standalone Message to one recipient	7.2.1.2	
CPM-CF-C-006-M	Sending a Large Message Mode CPM Standalone Message to a CPM Ad-hoc Group	7.2.1.2	
CPM-CF-C-007-M	Sending a Large Message Mode CPM Standalone Message to a CPM Pre-defined Group	7.2.1.2	
CPM-CF-C-008-O	Forwarding/Including Stored Data without Downloading to the CPM Client – Pager Mode	7.2.1.4	
CPM-CF-C-009-O	Forwarding/Including Stored Data without Downloading to the CPM Client – Large Message Mode	7.2.1.4	
CPM-CF-C-010-M	Receiving Pager Mode CPM Standalone Message	7.2.2.1	
CPM-CF-C-011-M	Receiving Large Message Mode CPM Standalone Message	7.2.2.2	
CPM-CF-C-012-M	Subscribing to Deferred CPM Message Information	7.2.3.1	
CPM-CF-C-013-M	Handling selected Deferred CPM Messages before expiry	7.2.3.2.1	
CPM-CF-C-014-M	Retrieving all Deferred CPM Messages before expiry	7.2.3.2.1	
CPM-CF-C-015-O	Retrieving CPM Standalone Messages after expiry	7.2.3.2.2	
CPM-CF-C-016-O	Handling expiry notifications for Deferred CPM Messages	7.2.3.3	
CPM-CF-C-017-M	Out-of-band notification handling	7.2.3.4.1	
CPM-CF-C-018-M	In-band notification handling	7.2.3.4.2	

Item	Function	Reference	Requirement
CPM-CF-C-019-M	Generate Delivery Notification	5.4.1	
CPM-CF-C-020-M	Generate Read Report	5.4.2	
CPM-CF-C-021-M	Receive Delivery Notification	5.4.3	
CPM-CF-C-022-M	Receive Read Report	5.4.4	
CPM-CF-C-023-M	Initiating a CPM 1-1 Session	7.3.1.1	
CPM-CF-C-021-M	Initiating a CPM Group Session for a CPM Ad-hoc Group	7.3.1.2	
CPM-CF-C-022-M	Initiating a CPM Group Session for a CPM Pre-defined Group	7.3.1.3	
CPM-CF-C-023-M	Join a CPM Group Session for a Join-in Group	7.3.1.4	
CPM-CF-C-024-M	Receiving a CPM Session Initiation	7.3.2	
CPM-CF-C-025-M	Extending a CPM 1-1 Session to a CPM Group Session	7.3.3	
CPM-CF-C-026-M	Sending a CPM 1-1 Session Closure	7.3.4.1	
CPM-CF-C-027-M	Leaving a CPM Group Session	7.3.4.2	
CPM-CF-C-028-M	Receiving a CPM Session Closure	7.3.4.3	
CPM-CF-C-029-M	Inviting one User to existing CPM Group Session	7.3.5	
CPM-CF-C-030-M	Inviting more than one User to existing CPM Group Session	7.3.5	
CPM-CF-C-031-M	Removing one Participant from a CPM Group Session	7.3.6	
CPM-CF-C-032-O	Removing more than one Participant from a CPM Group Session	7.3.6	
CPM-CF-C-033-M	Modifying a CPM Session	7.3.7	
CPM-CF-C-034-M	CPM Client receiving an CPM Session modification request	7.3.8	
CPM-CF-C-035-M	CPM Session Media Plane Handling – MSRP	7.3.9.1	
CPM-CF-C-036-M	CPM Session Media Plane Handling – RTP/RTCP	7.3.9.2	
CPM-CF-C-037-M	Subscribe to Receiving Participant Information	7.3.10.1	
CPM-CF-C-038-M	Receive Participant Information Notification	7.3.10.2	
CPM-CF-C-039-M	Initiating a CPM File Transfer to a single recipient	7.4.1	
CPM-CF-C-040-M	Initiating a CPM File Transfer to a CPM Ad-hoc Group	7.4.1	
CPM-CF-C-041-M	Initiating a CPM File Transfer to a CPM Pre-defined Group	7.4.1	

Item	Function	Reference	Requirement
CPM-CF-C-042-M	Receiving a CPM File Transfer	7.4.2	
CPM-CF-C-043-M	Releasing a CPM File Transfer	7.4.3	
CPM-CF-C-044-M	Fetching Deferred CPM File Transfer file(s)	7.4.4	
CPM-CF-C-045-M	Resuming an interrupted CPM File Transfer	7.4.5	
CPM-CF-C-046-M	Handling "isComposing"	5.5	
CPM-CF-C-047-M	Handling Deferred CPM Group Session message delivery	7.3.11	
CPM-CF-C-048-M	Handling Deferred CPM 1-1 Session message delivery	7.3.12	
CPM-CF-C-049-M	Handling Re-joining CPM Long-live Group Session	7.3.1.5	
CPM-CF-C-050-M	Handle CPM Session Closed Group Chat	7.3.1	CPM-CF-C-021-M AND CPM-CF-C-030-M

B.2   SCR for CPM Participating Function

Item	Function	Reference	Requirement
CPM-CF-PF-S-001-M	Handle registration events	8.1	
CPM-CF-PF-S-002-M	Handle Pager Mode CPM Standalone Message in originating network	8.2.1.1	
CPM-CF-PF-S-003-O	Fetch and include objects from Message Storage Server	8.2.1.1	
CPM-CF-PF-S-004-O	Extend Pager Mode to Large Message Mode	8.2.1.1	
CPM-CF-PF-S-005-M	Handle Large Message Mode CPM Standalone Message in the originating network	8.2.1.2	
CPM-CF-PF-S-006-O	Fetch and include objects from Message Storage Server	8.2.1.2	
CPM-CF-PF-S-007-M	Handle Disposition Notification in the originating network	8.2.4 & 8.2.5	
CPM-CF-PF-S-008-M	Handle a CPM Session Invitation in the originating network	8.2.2.1	
CPM-CF-PF-S-009-M	Handle a SIP CANCEL request in the originating network	8.2.2.2	
CPM-CF-PF-S-010-M	Handle a SIP BYE request in the originating network	8.2.2.3	
CPM-CF-PF-S-011-M	Handle SIP session expiry in the originating network	8.2.2.4	
CPM-CF-PF-S-012-M	Handle CPM Session modification request in the originating network	8.2.2.5	

Item	Function	Reference	Requirement
CPM-CF-PF-S-013-M	Handle CPM File Transfer initiation in the originating network	8.2.3.1	
CPM-CF-PF-S-014-M	Handle CPM File Transfer closing in the originating network	8.2.3.2	
CPM-CF-PF-S-015-M	Handle Pager Mode CPM Standalone Message in the terminating network	8.3.1.1	
CPM-CF-PF-S-016-M	Handle Large Message Mode CPM Standalone Message in the terminating network	8.3.1.2	
CPM-CF-PF-S-017-O	Replacing Media with a reference	8.3.1.3	
CPM-CF-PF-S-018-M	Sending disposition notifications	**Error! Reference source not found.**	
CPM-CF-PF-S-019-M	Defer CPM Standalone Messages	8.3.1.5	CPM-CF-PF-S-020-O OR CPM-CF-PF-S-021-O OR CPM-CF-PF-S-022-O
CPM-CF-PF-S-020-O	Pushing Deferred CPM Messages	8.3.1.5.2	
CPM-CF-PF-S-021-O	Sending notifications and awaiting CPM Client action	8.3.1.5.3	
CPM-CF-PF-S-022-O	Delivering Deferred CPM Message to the Message Storage Server	12	
CPM-CF-PF-S-023-M	Handle Deferred Message Information Request	8.3.1.5.5	
CPM-CF-PF-S-024-M	Handling Deferred CPM Messages on expiry time	8.3.1.5.8	
CPM-CF-PF-S-025-O	Sending expiry notifications	8.3.1.5.8	
CPM-CF-PF-S-026-M	Handle a CPM Session Invitation in the terminating network	8.3.2.1	
CPM-CF-PF-S-027-M	Handle a SIP CANCEL request in the terminating network	8.3.2.2	
CPM-CF-PF-S-028-M	Handle a SIP BYE request in the terminating network	8.3.2.3	
CPM-CF-PF-S-029-M	Handle SIP session expiry in the terminating network	8.3.2.4	
CPM-CF-PF-S-030-M	Handle CPM Session modification request in the terminating network	8.3.2.5	
CPM-CF-PF-S-031-M	Handle CPM File Transfer initiation in the terminating network	8.3.3.1	
CPM-CF-PF-S-032-M	Handle CPM File Transfer closing in the terminating network	8.3.3.2	

Item	Function	Reference	Requirement
CPM-CF-PF-S-033-O	Record CPM Standalone Message	8.5.1	
CPM-CF-PF-S-034-O	Record CPM Session	8.5.2	
CPM-CF-PF-S-035-O	Record CPM File Transfer	8.5.3	
CPM-CF-PF-S-036-M	Generate Delivery Notification	5.4.1	
CPM-CF-PF-S-037-M	Handling CPM Long-lived Group Chat	8.2.2.7.2	CPM-CF-PF-S-010-M AND CPM-CF-PF-S-038-O AND CPM-CF-PF-S-039-M
CPM-CF-PF-S-038-O	Handle Participant Information	8.2.2.6	
CPM-CF-PF-S-039-M	Handle CPM Group Session Re-join Request	8.2.2.7	
CPM-CF-PF-S-040-M	Handle Deferred delivery CPM Group Session	8.3.2.9	CPM-CF-PF-S-038-O
CPM-CF-PF-S-041-M	Handle Deferred CPM File Transfer Files(s)	8.3.3.3	CPM-CF-PF-S-042-O AND CPM-CF-PF-S-043-O AND CPM-CF-PF-S-044-O AND CPM-CF-PF-S-045-O AND CPM-CF-PF-S-046-O
CPM-CF-PF-S-042-O	Delivering Deferred CPM File Transfer file(s)	8.3.3.4	
CPM-CF-PF-S-043-O	Generate request for Deferred delivery of CPM File Transfer File(s)	8.3.3.5	
CPM-CF-PF-S-044-O	Receive request for Deferred delivery of CPM File Transfer File(s)	8.3.3.6	
CPM-CF-PF-S-045-O	Storing CPM File Transfer Deferred Information	8.3.3.7	
CPM-CF-PF-S-046-O	Media Plane handling for MSRP Session	8.3.3.9	

B.3   SCR for CPM Controlling Function

Item	Function	Reference	Requirement
CPM-CF-CF-S-001-M	Pager Mode CPM Message to CPM Ad-Hoc Group	9.1.1	
CPM-CF-CF-S-002-M	Pager Mode CPM Message to CPM Pre-defined Group	9.1.1	
CPM-CF-CF-S-003-M	Large Message Mode CPM Message to CPM Ad-Hoc Group	9.1.2	
CPM-CF-CF-S-004-M	Large Message Mode CPM Message to CPM Pre-defined Group	9.1.2	
CPM-CF-CF-S-005-M	Disposition Notification Handling	**Error! Reference source not found.**	
CPM-CF-CF-S-006-M	Ad-hoc Session Invitation	9.2.1	

Item	Function	Reference	Requirement
	Request		
CPM-CF-CF-S-007-M	Pre-defined Group Session Invitation Request	9.2.1	
CPM-CF-CF-S-008-M	Session Cancellation Request	9.2.2	
CPM-CF-CF-S-009-M	Joining Pre-defined Group Session Request	9.2.3	
CPM-CF-CF-S-010-M	Rejoining Group Session Request	9.2.4	
CPM-CF-CF-S-011-M	Adding Participants Request	9.2.5	
CPM-CF-CF-S-012-M	Removing Participant Request	9.2.6	
CPM-CF-CF-S-013-M	Session Leaving Request	9.2.7	
CPM-CF-CF-S-014-M	Group Session Modification	9.2.8	
CPM-CF-CF-S-015-M	Group Session Ending Request	9.2.9	
CPM-CF-CF-S-016-M	Group Session Media Plane Handling – MSRP	9.2.12.1	
CPM-CF-CF-S-017-M	Group Session Media Plane Handling – RTP/RTCP	9.2.12.2	
CPM-CF-CF-S-018-O	Pseudonyms in a CPM Group Session	9.2.13	
CPM-CF-CF-S-019-M	CPM Group Session Information Request	9.2.14.1	
CPM-CF-CF-S-020-M	Sending Participant Information notifications	9.2.14.2	
CPM-CF-CF-S-021-M	Terminating the subscription	9.2.14.3	
CPM-CF-CF-S-022-M	CPM File Transfer Handling	9.3	
CPM-CF-CF-S-023-M	Handling CPM Long-lived Group Chat	9.2.4	CPM-CF-CF-S-010-M AND CPM-CF-CF-S-015-M AND CPM-CF-CF-S-024-M
CPM-CF-CF-S-024-M	Participant Removing Request	9.2.11	
CPM-CF-CF-S-025-M	Handling CPM Session Closed Group Chat	8.2.1	CPM-CF-CF-S-006-M AND CPM-CF-CF-S-007-M AND CPM-CF-CF-S-008-M AND CPM-CF-CF-S-009-M AND CPM-CF-CF-S-010-M AND CPM-CF-CF-S-011-M AND CPM-CF-CF-S-013-M

Appendix C. CPM-defined SIP Header fields

C.1 Header field Definitions

C.1.1 Conversation-ID

A Conversation-ID header field in a SIP MESSAGE request or SIP INVITE request indicates the CPM Conversation Identity associated with a CPM Standalone Message, CPM File Transfer, or CPM Session.

A sending CPM functional component MUST include a Conversation-ID header field in each SIP MESSAGE request or SIP INVITE request that are associated with a CPM Standalone Message, a CPM File Transfer, or a CPM Session. The sending CPM functional component MUST ensure that the included CPM Conversation Identity is globally unique. A Conversation-ID SHALL be a universally unique identifier, as specified in [RFC4122]. Following the conventions in [RFC4122], Conversation-IDs are case-insensitive.

Examples:

```
Conversation-ID: f81d4fae-7dec-11d0-a765-00a0c91e6bf6
```

C.1.2 Contribution-ID

A Contribution-ID header field in a SIP MESSAGE request or SIP INVITE request indicates the CPM Contribution Identity associated with a CPM Standalone Message, CPM File Transfer, or CPM Session.

A sending CPM functional component MUST include a Contribution-ID header field in each SIP MESSAGE request or SIP INVITE request that are associated with a CPM Standalone Message, a CPM File Transfer, or a CPM Session. The sending CPM functional component MUST ensure that the included CPM Contribution Identity is unique within the context of the encompassing CPM Conversation. A Contribution-ID SHALL be a universally unique identifier, as specified in [RFC4122]. Following the conventions in [RFC4122], Contribution-IDs are case-in sensitive.

Example:

```
Contribution-ID: dfb4e64f-2c98-46a1-8e14-98eb5736a268
```

C.1.3 InReplyTo-Contribution-ID

An InReplyTo-Contribution-ID header field in a SIP MESSAGE request or SIP INVITE request indicates the CPM Contribution Identity associated with a CPM Standalone Message, CPM File Transfer, or CPM Session, to which this request is a reply to.

When a CPM User replies to a CPM Standalone Message, CPM File Transfer, or CPM Session, the replying CPM Client MUST include a InReplyTo-Contribution-ID header field in the SIP MESSAGE request or SIP INVITE request associated with the reply CPM Standalone Message, the reply CPM File Transfer or the reply CPM Session, and populate it with the CPM Contribution Identity of the CPM Standalone Message, CPM File Transfer or CPM Session being replied to.

Example:

```
InReplyTo-Contribution-ID: 01234567-89ab-cdef-0123-456789abcdef
```

C.1.4 Session-Replaces

A Session-Replaces header field in a SIP INVITE request carries the same CPM Contribution Identity associated with a previously established CPM 1-1 Session that should be replaced by the new CPM Session Invitation.

A sending CPM Client MUST include a Session-Replaces header field in the SIP INVITE request that extends a CPM 1-1 Session into a CPM Group Session. This header field will contain the value of the Contribution-ID sent in the original CPM 1-1 Session. The receiving CPM Client uses this value to end the previous session if it accepts the new session invitation.

Example:

```
Session-Replaces: abcdef-1234-5678-90ab-cdef01234567
```

C.1.5 Message-Expires

A Message-Expires header field in a SIP INVITE request to initiate a Large Message Mode CPM Standalone Message transfer carries the expiry time associated with the Large Message Mode CPM Standalone Message. It functions in the same manner as the Expires header field for MESSAGE requests.

> NOTE: A Message-Expires header field in a SIP INVITE request that is not meant to initiate a Large Message Mode CPM Standalone Message transfer is to be ignored by the SIP UAS.

A sending CPM Client MUST include a Message-Expires header field in each SIP INVITE request that starts the transfer of a Large Message Mode CPM Standalone Message if it wants to associate an expiry time with that Large Message Mode CPM Standalone Message. This header field will contain the relative time after which the Large Message Mode CPM Standalone Message expires.

Example:

```
Message-Expires: 259200
```

C.1.6 Message-UID

A Message-UID header field in a SIP MESSAGE request, 200 OK SIP response or SIP BYE request indicates the Unique Identifier value as described in [OMA-CPM_TS_MessageStorage] of the associated CPM Standalone Message, CPM File Transfer History, or CPM Session History that is stored in the CPM User's network-based Message Storage.

When a CPM Standalone Message, CPM File Transfer History, or CPM Session History is stored by the CPM Participating Function in the CPM User's network-based Message Storage, the delivering CPM Participating Function MUST include a Message-UID header field in each SIP MESSAGE request, 200 OK response or SIP BYE request associated with a CPM Standalone Message, a CPM File Transfer History, or a CPM Session History.

Examples:

```
Message-UID: 4392
```

When a CPM Standalone Message includes this header field, the CPM Client SHALL store the value of this Message-UID header field in conjunction with the received CPM Standalone Message, CPM File Transfer History or CPM Session History in a local storage. When synchronizing the messages on the locally stored in a device with the CPM User's Message Storage Server, the CPM Standalone Message having this value will not be retrieved again.

C.1.7 Contact Header field values

The Contact header field in a SIP INVITE request and responses may carry the 'isFocus' tag which needs to be preserved end to end.

Any SIP entities in the path SHALL keep the value of the 'isFocus' tag in the Contact header field and SHALL not remove it.

C.2 ABNF for the CPM-defined SIP Headers

```
CPM-Headers = (Conversation-ID
            /  Contribution-ID
            /  InReplyTo-Contribution-ID
            /  Session-Replaces
            /  Message-Expires
            /  Message-UID)  CRLF


Conversation-ID = "Conversation-ID" HCOLON conversationid
conversationid = word

Contribution-ID = "Contribution-ID" HCOLON contributionid
contributionid = word
```

```
InReplyTo-Contribution-ID = "InReplyTo-Contribution-ID" HCOLON
                             contributionid

Session-Replaces = "Session-Replaces" HCOLON sessionreplaces
Sessionreplaces = word

Message-Expires = "Message-Expires" HCOLON delta-seconds

Message-UID = "Message-UID" HCOLON uniqueid
```

NOTE 1: The tokens "CRLF", "HCOLON", "word" and "delta-seconds" are defined in [RFC3261].

NOTE 2: The token "uniqueid" is defined in [RFC3501].

Appendix D.   Release Version in User-agent and Server headers (Normative)

User-Agent and Server headers are used to indicate the release version and product information of the CPM Client, the CPM Participating Function and the CPM Controlling Function.

The CPM Client, the CPM Participating Function and the CPM Controlling Function shall implement the User-Agent and Server headers, according to the rules and procedures of [RFC3261] with the clarifications in this subclause specific for CPM.

The User-Agent and Server headers ABNF are specified in [RFC3261] and extended as follows:

```
Server = "Server" HCOLON server-val *(LWS server-val)
User-Agent = "User-Agent" HCOLON server-val *(LWS server-val)
server-val = product / comment
product = CPM-product / token [SLASH product-version]
product-version = token
```

D.1   CPM Version 1.0

This specification allows having several server-val tags. The first of those server-val tags shall be encoding according to the following ABNF:

```
CPM-product = "CPM-" cpm-device-token (SLASH cpm-product-version)
CPM-device-token = "client" | "serv" token
CPM-product-version = "OMA1.0"
```

Example 1:

In this example CPM Client acting as UAC and the CPM Participating Function acting as UAS are OMA CPM release version 1.0 products. The CPM Client has inserted its own company and product name and version "Arena-Messaging1000/v1.01".

   User-Agent: CPM-client/OMA1.0 Arena-Messaging1000/v1.01

   Server: CPM-serv/OMA1.0

Example 2:

In this example both the CPM Participating Function acting as UAC and the CPM Client acting as UAS are OMA CPM release version 1.0 products.

   User-Agent: CPM-serv/OMA1.0

   Server: CPM-client/OMA1.0

D.2   CPM Version 2.0

CPM Enabler version 2.0 uses the same server-val tags and encoding as defined by CPM version 1.0, where the ABNF encoding of the first of those server-val tags SHALL be according to following:

```
CPM-product = "CPM-" cpm-device-token (SLASH cpm-product-version)
CPM-device-token = "client" | "serv" token
CPM-product-version = "OMA2.0"
```

Example 1:

In this example CPM Client acting as UAC and the CPM Participating Function acting as UAS are OMA CPM release version 2.0 products. The CPM Client has inserted its own company and product name and version "Arena-Messaging1000/v1.01".

User-Agent: CPM-client/OMA2.0 Arena-Messaging1000/v1.01

Server: CPM-serv/OMA2.0

Appendix E.   Examples of CPM-based Services

This appendix lists several examples of CPM-based Services. This list is not exhaustive and not intended to limit the development of further CPM-based Services.

E.1   Video Share Service along with a pre-existing Voice Call

The video share service along with pre-existing voice call allows a User to share a video continuous media stream with another user, along with a pre-existing voice-call (CS-voice or VOIP).

The CPM User can decide to share pre-recorded or live video with his contact.

The video share CPM-based Service uses the *+g.3gpp.cs-voice* feature tag to identify itself and the service is defined in [GSMA IR.74], and, with some extensions to [GSMA IR.74], in [GSMA IR 84].

The video share CPM-based Service uses the following facilities offered by CPM:

- Registration services as described in sections 7.1 "*Registering at the SIP/IP Core*" and 8.1 "*Registration*".

- CPM Session services as described in sections 7.3 "*CPM Session Handling*", 7.3.9 "*Media Plane Handling for CPM Sessions*", and 8.3.2 "*CPM Session Handling*", with the following restrictions:

    - The CPM Client sends a SIP INVITE request and establishes a half duplex RTP session as described in [GSMA IR.74] including CPM Conversation Identity as describe in 7.3.1.1 "*Initiating a CPM 1-1 Session*"

    - Only uni-directional video streams are supported.

A client uses SIP OPTIONS method to query video share service capability of terminating-party client(s), as described in [GSMA IR.74].

E.2   Video Share Service without a pre-existing Voice Call

The video share service without a pre-existing voice call allows a User to share a video continuous media stream with another user without a pre-existing voice-call.

The CPM User can decide to share pre-recorded or live video with his contact.

The video share CPM-based Service uses the ICSI(s) and IARI(s) defined in [GSMA IR 84] to identify itself and the service is defined in [GSMA IR 84].

The video share CPM-based Service uses the following facilities offered by CPM:

- Registration services as described in sections 7.1 "*Registering at the SIP/IP* Core" and 8.1 "*Registration*".

- CPM Session services as described in sections 7.3 "*CPM Session Handling*", 7.3.9 "*Media Plane Handling for CPM Sessions*", and 8.3.2 "*CPM Session Handling*", with the following restrictions:

    - The CPM Client sends a SIP INVITE request and establishes a half duplex RTP session as described in [GSMA IR 84]including CPM Conversation Identity as describe in 7.3.1.1 "*Initiating a CPM 1-1 Session*"

    - Only uni-directional video streams are supported.

A client uses SIP OPTIONS method to query video share service capability of terminating-party client(s), as described in [GSMA IR 84].

Appendix F.   The Parameters to be provisioned the CPM Service (Normative)

F.1   OMA CPM Device Management general

This appendix describes the parameters that are needed for initiation of the CPM service, as well as continuous provisioning by service providers. These parameters are specified in a Client Provisioning Application Characteristics document (AC file) and a Device Management Object (DM MO). The bootstrap function specified in [OMA Client Provisioning] and [OMA DM] SHALL be used to enforce the security of provisioning. Existing parameters in [OMA Provisioning Content] and [OMA DM] are re-used; those without corresponding parameters are defined in this specification and to be registered in OMNA through OMA official registration procedures.

1. APPID (Application ID): The application characteristics name for this application, to be used by the DM Client to uniquely identify the application.

2. NAME: Application name. To be displayed on the client side. This parameter is specific for each service provider.

3. PROVIDER-ID: provides an identifier for the application service access point.

4. TO-NAPID: allows an application to refer to a network access point with a matching NAPID parameter. It is only possible to refer to network access points defined within the same provisioning document.

5. TO-APPREF: parameter links the APPLICATION characteristics to another secondary APPLICATION characteristic with a matching APPREF parameter.

6. Max Ad-hoc Group size: Maximum number of Participants allowed for a CPM Group Session for a CPM Ad-hoc Group.

7. Controlling Function URI: A SIP URI used for setting up a CPM Group Session for a CPM Ad-hoc Group or for sending a Pager Mode or Large Message Mode CPM Standalone Message to a CPM Ad-hoc Group.

8. Message Storage Server URI: A URI for CPM user's message store.

9. CPMDeferredMsgMgmtURI: A SIP URI for CPM user's Deferred CPM Message function.

10. Max File Transfer Size: the maximum size in bytes per file for CPM File Transfer requests.

These parameters are to be registered in OMNA.

These parameters SHALL be obtained via the DM-1 reference point, from the data which is provisioned to the DM Client as specified in [OMA Provisioning Content] and [OMA DM].

Appendix G.   Interoperability with OMA SIMPLE IM Clients

The CPM Participating Function MAY support interoperability with OMA SIMPLE IM clients, in order to support operators in deployments where an operator wants to support OMA SIMPLE IM clients with the CPM Enabler. In that case the CPM Participating Function SHALL act in the following manner:

- When delivering a CPM request to an OMA SIMPLE IM Client, the terminating CPM Participating Function SHALL change in the CPM request the CPM Feature Tags so that it contains the IM Enabler identifier (i.e. +g.oma.sip-im), and for Large Message Mode CPM Standalone Messages, the +g.oma.sip-im.large-message feature tag. The CPM Participating Function SHALL NOT fetch the IM user preferences or apply any IM services to the incoming request, but shall only deliver the request towards the IM Client.

- When receiving an OMA SIMPLE IM request, a CPM Participating Function SHALL change in the OMA SIMPLE IM request the IM Enabler identifier to the CPM Enabler identifier and appropriate CPM Enabler feature tags before routing the request. The CPM Participating Function SHALL also add Conversation-ID and Contribution-ID headers as defined in section 5.2.3.1 of [OMA-CPM-SD].

NOTE 1:   Only interoperability with online OMA SIMPLE IM clients is supported. This means that OMA SIMPLE IM clients can receive CPM requests and that online OMA SIMPLE IM clients can submit OMA SIMPLE IM requests towards the CPM Enabler. More advanced OMA SIMPLE IM functionalities, such as messages deferral for OMA SIMPLE IM clients, is not possible with the CPM Enabler.

NOTE 2:   The above bullets require functionality in the SIP/IP core to send incoming CPM Standalone Messages, CPM Standalone Message disposition notifications, CPM File Transfers and CPM Sessions destined towards an OMA SIMPLE IM Client and incoming IM Messages, IM File Transfers and IM Sessions destined to a CPM Client to the CPM Participating Function.

NOTE 3:   A network which deployed OMA SIMPLE IM only and which is to interoperate with CPM, is assumed to be able to deliver CPM requests to OMA SIMPLE IM Clients

OMA SIMPLE IM based services	Format and values of OMA IM Enabler Identifiers	Format and values of OMA CPM Enabler Identifier and Features Tags
SIMPLE IM Pager Mode, File Transfer, IM Session	In Contact and Accept-Contact headers: +g.oma.sip-im	In Contact and Accept-Contact headers: +g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.oma.cpm.msg" or +g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.oma.cpm.filetransfer" or +g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.oma.cpm.session" In the P-Asserted-Service header: urn:urn-7:3gpp-service.ims.icsi.oma.cpm.msg or urn:urn-7:3gpp-service.ims.icsi.oma.cpm.filetransfer or urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session
SIMPLE IM Large Message Mode	In Contact and Accept-Contact headers: +g.oma.sip-im; +g.oma.sip-im.large-message	In Contact and Accept-Contact headers: +g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.oma.cpm.largemsg" In the P-Asserted-Service header: urn:urn-7:3gpp-service.ims.icsi.oma.cpm.largemsg

Table 3: SIMPLE IM Enabler Feature Tags Mapping to/from OMA CPM Enabler Identifiers

Appendix H.   CPM Feature Tags

This Appendix describes the CPM Feature identifiers used in this Technical Specification.

H.1   CPM Feature Identifiers

The CPM Feature identifiers allow the SIP/IP core to immediately recognize the enabler being invoked in order to route the request to the right application server. CPM Feature identifiers are carried in feature tags as described in section H.3 "*Proposed Formats for CPM Feature Identifiers*".

The CPM Enabler needs several identifiers in order to identify the signalling related to the CPM Enabler as it is processed by the CPM Client and the SIP/IP core as well as by the CPM Participating and Controlling Functions and to identify all the different features supported by the CPM Enabler.

The CPM Feature identifiers identify which CPM Feature the CPM Client is using or willing to use.

If the SIP/IP core corresponds to 3GPP/3GPP2 IMS, the CPM Feature identifiers are referred to as IMS Communication Service Identifiers, or ICSI.

When the 3GPP/3GPP2 IMS core receives the P-Preferred-Service header value, it verifies the value of this field and creates the P-Asserted-Service header value, as described in [3GPP TS 24.229] and deletes the P-Preferred-Service header value.

H.2   CPM Client Behaviour

The CPM Client SHALL identify all the CPM Features it supports and the CPM-based Services it supports by including the feature tags identifying them in the **Contact header** when it registers as described in [RFC3840].

It SHALL also include the feature tag being used for a particular feature in the **Contact header** when it issues any other SIP request except in the SIP MESSAGE request which does not contain a Contact header.

The CPM Client SHALL also identify the particular CPM Feature as well as any CPM-based Service it wishes to use during a particular communication by including the feature tags identifying them in the **Accept-Contact** header as described in [RFC3841].

The CPM Client SHALL identify the particular CPM Feature it is using when it issues specific SIP requests by including the particular CPM Feature in the **P-Preferred-Service** header as described in [3GPP TS 24.229].

H.3   Proposed Formats for CPM Feature Identifiers

When the SIP/IP core corresponds to 3GPP/3GPP2 IMS according to the rules and procedures of [3GPP TS 24.229]/[3GPP2 X.S0013.004], the CPM Feature identifier SHALL be set to:

1. +g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.oma.cpm.<cpm-feature>" when it is carried as a feature tag in a Contact or Accept-Contact header; and,

2. urn:urn-7:3gpp-service.ims.icsi.oma.cpm.<cpm-feature> when it is carried as a URN in a P-Preferred-Service or P-Asserted-Service header as described in [3GPP TS 24.229].

When the SIP/IP core is not 3GPP/3GPP2, it is recommended that the same values of the CPM Features identifiers be used as when the SIP/IP core corresponds to 3GPP/3GPP2 IMS in order to facilitate interoperability.

The CPM Feature identifier carried as a feature tag SHALL be used by CPM Clients and CPM Participating and Controlling Functions, as specified in the procedures in this document.

The CPM Feature identifier carried as a URN in a P-Preferred-Service header SHALL be used by CPM Clients and carried as a URN in a P-Asserted-Service header SHALL be used by CPM Participating and Controlling Functions, as specified in the procedures in this document, when the SIP/IP core corresponds to 3GPP/3GPP2 IMS.

The **<cpm-feature>** value in the CPM Feature identifier further identifies the CPM Feature being invoked as described in Error! Reference source not found. **below.**

CPM Features	Format and values for Accept-Contact and Contact	Format and values for P-Preferred-Service and P-Asserted-Service
Pager Mode CPM Message	+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.oma.cpm.msg"	urn:urn-7:3gpp-service.ims.icsi.oma.cpm.msg
Large Message Mode CPM Message	+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.oma.cpm.largemsg"	urn:urn-7:3gpp-service.ims.icsi.oma.cpm.largemsg
CPM File Transfer	+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.oma.cpm.filetransfer"	urn:urn-7:3gpp-service.ims.icsi.oma.cpm.filetransfer
CPM Session	+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.oma.cpm.session"	urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session
Deferred CPM Message	+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.oma.cpm.deferred"	urn:urn-7:3gpp-service.ims.icsi.oma.cpm.deferred
CPM Notification	+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.oma.cpm.systemmsg"	urn:urn-7:3gpp-service.ims.icsi.oma.cpm.systemmsg

Table 4: Formats for CPM Feature identifiers

H.4   Client CPM-based Service Identification

A CPM-based Service SHALL be identified by its own feature tag. If the SIP/IP core corresponds to 3GPP/3GPP2 IMS, the IMS Application Reference Identifier, or IARI is used to carry this CPM-based Service identifier in the Accept-Contact header according to the rules and procedures of [3GPP TS 24.229]/[3GPP2 X.S0013.004]

CPM-based Service	Format and values for Accept-Contact and Contact
CPM-based Service	+g.3gpp.iari-ref="urn%3Aurn-7%3A3gpp-application.ims.iari.oma.cpm.*<iari-value>*"

Table 5: CPM-based Service identifiers

H.5   P-Asserted-Service Header Field

A CPM-based Service SHALL be identified by its own ICSI and based on [3GPP TS24.229] an Application Server (i.e. CPM Participating Function) MAY populate the P-Asserted-Service header field with the appropriate asserted ICSI for the service, if the S-CSCF has not done it hence the P-Preferred-Service header field is received in the request by the CPM Participating Function.

Appendix I.   CPM Notification Formats

I.1   Deferred CPM Message Notification Format

I.1.1   Out-of-band Deferred CPM Message Notification Format

The purpose of the out-of-band notification is to inform the CPM Client that one or more Deferred CPM Messages are stored in the CPM Participating Function. Based on this information, the CPM Client or the CPM User MAY decide to register for the CPM service in order to retrieve the deferred messages.

The out-of-band Deferred CPM Message Notification is sent using the Push enabler. The CPM Participating Function SHALL submit a Push message as described in section 5.1 of [OMA-PAP]. The message SHALL contain:

- A control entity, as defined in [OMA-PAP] section 8.2, and

- A content entity carrying metadata about the deferred CPM Message formatted according to the "application/msginfo+xml" MIME type defined in Appendix J.1 "*Deferred Messages Metadata*". When the notification is to be sent via an SMS, the CPM Participating Function SHALL ensure that the size of the content entity is at most 140 bytes.

The Push message SHALL be formatted according to [OMA-Push-Message] and the parameters of the message are described in [OMA-Push-OTA].

  NOTE: a new application identifier "X-Wap-Application-Id" must be assigned by and registered with OMNA for identifying the CPM enabler.

I.1.2   In-band Deferred CPM Message Notification Format

The in-band Deferred CPM Message notification is sent in a SIP MESSAGE request as specified in section 8.3.1.5.3 "*Sending Notifications and Awaiting CPM Client Action*".

The body of the message SHALL be an XML document carrying metadata about the Deferred CPM Message.

The metadata is the same as the metadata defined for the <deferred-messages> event package in Appendix J.1 "*Deferred Messages Metadata*" with the stipulation that only one <message> element is included.

I.2   Notification Format of Deferred CPM Message After Expiry

The purpose of this notification is to let the CPM Client know how a Deferred CPM Message was handled upon expiry. This notification is handled as described in section 7.2.3.3 "*Receiving a notification for Expiry of Deferred CPM Standalone Message*".

I.2.1   Out-of-band Notification

The out-of-band notification of Deferred CPM Message after expiry is sent using the Push enabler.

The CPM Participating Function SHALL submit a Push message as described in section 5.1 of [OMA-PAP]. The message SHALL contain:

- a control entity, as defined in [OMA-PAP] section 8.2, and,

- a content entity carrying information about the deferred CPM Message after expiry, formatted according to the "application/msginfo+xml" MIME type defined in Appendix K "*Format of Notification for Deferred CPM Message after Expiry*".

The Push message SHALL be formatted according to [OMA-Push-Message] and the parameters of the message are described in [OMA-Push-OTA].

I.2.2   In-band notification

The in -band Deferred CPM Message Notification is sent in a SIP MESSAGE request as specified in section 8.3.1.5.8 "*Handling Deferred CPM Messages on Expiry Time*".

The body of the message SHALL be an XML document carrying information defined in Appendix K "*Format of Notification for Deferred CPM Message after Expiry*".

Appendix J.   Deferred Messages event package definition

A new event package is defined for deferred messages. The CPM Client subscribes to this event to receive information about deferred messages at registration. The CPM Participating Function sends metadata about the deferred messages using this new event package.

NOTE: This event package needs to be registered with IANA and a new draft will be written and presented to IETF.

This section fills in the information required for all event packages by [RFC3265].

- Package Name

The name of this package is "deferred-messages"

As specified in [RFC3265], this value appears in the Event header field present in SUBSCRIBE and NOTIFY requests.

Example:

Event: deferred-messages

- Event Package Parameters

The SIP event framework allows event packages to define additional parameters carried in the Event header field. This package, deferred-messages, does not define any additional parameters.

- SUBSCRIBE Bodies

There is no body for the SUBSCRIBE to this event package

- Subscription duration

Only subscriptions with an Expires header of zero "0" are supported;

- NOTIFY body

The body of the NOTIFY will consist of an XML body containing the deferred messages metadata as described below.

The namespace URI for elements defined in this proposed event package is a URN, using the namespace identifier 'ietf'. This URN is:

urn:ietf:params:xml:ns:msginfo

A new MIME type, application/msginfo+xml is defined for this event package:

MIME media type name: application

MIME subtype name: msginfo+xml

J.1   Deferred Messages Metadata

J.1.1   Structure

The root element of the Deferred Messages Metadata document is a <message-list> element.

The <message-list> element:

1. MAY contain a "number" attribute indicating the number of deferred messages currently stored in the CPM Participating Function;

2. MAY contain one or more <message> elements containing descriptive information regarding each deferred message;

3. MAY include any other attributes from any other namespaces for the purposes of extensibility.

The <message> element:

1. MAY include a "date-time" attribute representing the date and time when the message was stored by the Deferred Function.

2. MAY include a "message-reference" attribute representing the complete path that uniquely identifies the message;

NOTE: The "message-reference" attribute is expected to be used only within in-band notifications.

3. MAY include a <size> element representing the size of the stored content;

4. MAY include an <expiry> element representing the date at which the message expires;

5. MAY include a <subject> element representing the Subject header field of the SIP request;

6. MAY include a <UPP-ID-list> element indicating the list of identifiers of User Preference Profiles of the CPM User for which no rule containing the action element <allow-reject-invite> with the value set to "true" is matching for the deferred message;

NOTE: The content of this element can be used by the CPM Client to decide how to handle the notification by comparing it with his active User Preference Profile.

7. MAY include an <info> element, containing:

    a.   a mandatory <from> element taken from the "From" header field of the SIP request;

    b.   optionally, one of the following elements, indicating the recipient(s) of the message

         i.   the <to> element containing the "To" header field of the SIP request if the message is sent to one CPM User; or

         ii. the <recipient-list> element if the message is aimed to multiple users. This element contains a copy of intended recipients, e.g. the group session participants or the URIs listed in the URI-list case as described in [RFC5365] or [RFC5368] ;

    c.   an optional <auth-id> element representing the Authenticated Originator's CPMAddress as defined in section 6.1 "*Authenticated Originator's CPM Address*" if Privacy setting allows;

    d.   optionally any other attributes from any other namespaces for the purposes of extensibility.

8. MAY include any other attributes from any other namespaces for the purposes of extensibility;

The <recipient-list> element SHALL contain one or more <entry> elements. Each <entry> element:

1. SHALL include a "uri" attribute representing the URI of a recipient for the message;

2. MAY include a <display-name> element, containing a human-readable name corresponding to the message recipient.

In case of pre-defined groups, the <recipient-list> element SHALL contain the "group-uri" and MAY contain the "group-display-name" attributes.

Appendix K.   Format of Notification for Deferred CPM Message after Expiry

The root element is <message-expired> that includes the attributes below.

1. SHALL include a "message-reference" attribute representing the complete path that uniquely identifies the message (i.e. message-URI-ID);

2. If the Deferred CPM Message was stored to Message Storage Server on expiry, SHALL include a "UID" attribute set to the UID value retrieved from the Message Storage Server.