



# **Immersive Social Centre (ISC) Specification**

Approved Version 1.0 – 30 Jun 2015

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**Open Mobile Alliance**  
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# Contents

<b>1. SCOPE</b> .....	<b>8</b>
<b>2. REFERENCES</b> .....	<b>9</b>
<b>2.1 NORMATIVE REFERENCES</b> .....	<b>9</b>
<b>2.2 INFORMATIVE REFERENCES</b> .....	<b>11</b>
<b>3. TERMINOLOGY AND CONVENTIONS</b> .....	<b>12</b>
<b>3.1 CONVENTIONS</b> .....	<b>12</b>
<b>3.2 DEFINITIONS</b> .....	<b>12</b>
<b>3.3 ABBREVIATIONS</b> .....	<b>12</b>
<b>4. ISC INTRODUCTION</b> .....	<b>14</b>
<b>4.1 VERSION 1.0</b> .....	<b>14</b>
<b>5. PROCEDURES AT ISC SERVER</b> .....	<b>15</b>
<b>5.1 CONTENTS GUIDE FUNCTION</b> .....	<b>15</b>
5.1.1 Contents List request handling.....	15
5.1.2 Content Interest management.....	16
<b>5.2 ASSOCIATED CONTENT FUNCTION</b> .....	<b>17</b>
5.2.1 Associated Contents Viewing Session Handling .....	17
<b>5.3 STORAGE FUNCTION</b> .....	<b>18</b>
<b>5.4 MULTI-DEVICE DISCOVERY FUNCTION</b> .....	<b>18</b>
5.4.1 Multi-device Capability Management and Discovery.....	18
5.4.2 Device Presence Information Management and Discovery .....	18
5.4.3 Multiple Devices Task Management .....	19
<b>5.5 PROCEDURES AT ISC MEDIA FUNCTION AND COMMUNICATION FUNCTION</b> .....	<b>21</b>
5.5.1 Immersive Content Viewing Session Handling .....	22
5.5.2 Associated Contents Viewing Session Handling .....	25
5.5.3 Self Content Viewing.....	26
5.5.4 1-1 Content Viewing and Communication session .....	28
5.5.5 Group Content Viewing and Communication session .....	30
5.5.6 Resuming Previous Content Viewing .....	33
<b>5.6 SOCIAL FUNCTION</b> .....	<b>34</b>
5.6.1 Handle Delegation of a Content Usage Right .....	34
5.6.2 User Interaction.....	36
5.6.3 Handle Content Interest – receive alert notification before content delivery .....	37
5.6.4 Social Relationship .....	38
5.6.5 Social Activity .....	39
<b>5.7 REGISTRATION AND AUTHENTICATION</b> .....	<b>40</b>
5.7.1 Subscribe Registration Event Information Notifications .....	40
5.7.2 Receive Registration Event Information Notifications .....	40
5.7.3 Terminate the Subscription to Registration Event Information .....	40
<b>6. PROCEDURES AT ISC CLIENT</b> .....	<b>41</b>
<b>6.1 REGISTRATION AND AUTHENTICATION</b> .....	<b>41</b>
<b>6.2 SELF CONTENT VIEWING</b> .....	<b>41</b>
6.2.1 Content Viewing.....	41
6.2.2 Change Content Viewing.....	42
6.2.3 Content Viewing with User Controls.....	42
<b>6.3 CONTENT VIEWING AND COMMUNICATION SESSION</b> .....	<b>43</b>
6.3.1 1-1 Content Viewing and Communication (Originating Side) .....	43
6.3.2 1-1 Content Viewing and Communication (Terminating Side) .....	44
6.3.3 1-1 Communication (Originating Side) .....	45
6.3.4 1-1 Change Content Viewing (Originating Side).....	46
6.3.5 1-1 Change Content Viewing (Terminating Side) .....	46
6.3.6 Control Content Viewing and Communication (Originating Side).....	46
6.3.7 1-1 Control Content Viewing (Terminating Side) .....	48

<b>6.4</b>	<b>GROUP CONTENT VIEWING AND COMMUNICATION SESSION .....</b>	<b>48</b>
6.4.1	Content Viewing and Communication with a Pre-defined Group (Originating Side) .....	48
6.4.2	Content Viewing and Communication with a Pre-defined Group (Terminating Side) .....	49
6.4.3	Content Viewing and Communication with a Pre-defined / Adhoc Group (Terminating Side) .....	50
6.4.4	Content Viewing and Communication with a Pre-defined Group – Control Content (Originating Side) .....	51
6.4.5	Group Communication (Originating Side) .....	52
6.4.6	Change Content Viewing in a Pre-defined Group (Originating Side) .....	53
6.4.7	Change Content Viewing in a Pre-defined Group (Terminating Side) .....	53
6.4.8	Content Viewing and Communication with a Adhoc Group (Originating Side) .....	54
6.4.9	Content Viewing and Communication with an Ad-hoc Group (Terminating Side) .....	55
6.4.10	Content Viewing and Communication with a Adhoc Group – Control Content (Originating Side) .....	55
6.4.11	Ad-hoc Group Communication (Originating Side) .....	57
6.4.12	Change Content Viewing in an Ad-hoc Group (Originating Side) .....	58
6.4.13	Change Content Viewing in an Ad-hoc Group (Terminating Side) .....	58
6.4.14	Searching Active Content Viewing Group according to Content View .....	58
<b>6.5</b>	<b>ASSOCIATED CONTENTS VIEWING SESSION HANDLING.....</b>	<b>59</b>
6.5.1	Initiating an Associated Contents Viewing Session.....	59
<b>6.6</b>	<b>IMMERSIVE CONTENT VIEWING SESSION HANDLING .....</b>	<b>60</b>
6.6.1	Initiating Immersive Content Viewing sessions.....	60
6.6.2	Modifying Immersive Content Viewing sessions .....	62
<b>6.7</b>	<b>RECEIVING CONTENTS LIST .....</b>	<b>63</b>
<b>6.8</b>	<b>DELEGATION OF A CONTENT USAGE RIGHT.....</b>	<b>64</b>
6.8.1	Delegating a Content Usage Right to other ISC Users (Originating Side) .....	64
6.8.2	Handle Delegation of a Content Usage Right (Terminating Side) .....	65
<b>6.9</b>	<b>RECOMMENDATION OF A CONTENT .....</b>	<b>65</b>
6.9.1	Recommending a Content to Another ISC User (Originating Side) .....	66
6.9.2	Receiving Recommendation of a Content from Another ISC User (Terminating Side) .....	66
<b>6.10</b>	<b>CONTENT INTEREST MANAGEMENT .....</b>	<b>67</b>
6.10.1	Content Interest – User Express Interest (Originating Side) .....	67
6.10.2	Content Interest – User Express Interest (Terminating Side) .....	68
6.10.3	Content Interest – Announcing Group Creation (Originating Side) .....	69
6.10.4	Content Interest – Announcing Group Creation (Terminating Side) .....	69
6.10.5	Content Interest – receive alert notification before content delivery (Originating Side) .....	69
6.10.6	Content Interest – receive alert notification before content delivery (Terminating Side) .....	70
<b>6.11</b>	<b>INTERACTION MANAGEMENT .....</b>	<b>71</b>
6.11.1	User expression .....	71
<b>6.12</b>	<b>MULTI-DEVICE CAPABILITY MANAGEMENT AND DISCOVERY .....</b>	<b>71</b>
6.12.1	Publishing Device Capability Information .....	71
6.12.2	Subscribing Devices Capability Information .....	72
<b>6.13</b>	<b>DEVICE PRESENCE INFORMATION MANAGEMENT AND DISCOVERY.....</b>	<b>72</b>
6.13.1	Publishing Device Presence Information to the ISC Server .....	72
6.13.2	Handling the Device Presence Information Subscription .....	72
<b>6.14</b>	<b>MULTIPLE DEVICES TASK MANAGEMENT.....</b>	<b>72</b>
6.14.1	Resuming a Stopped Content Viewing with any of the ISC User’s devices .....	72
6.14.2	Handling Notification to Establish Communication Session (Originating Side) .....	72
6.14.3	Handling Notification to Cancel Content Viewing Session (Terminating Side) .....	73
6.14.4	Handling Notification to Cancel Communication Session (Terminating Side) .....	73
<b>6.15</b>	<b>SOCIAL RELATIONSHIP.....</b>	<b>74</b>
<b>6.16</b>	<b>SOCIAL ACTIVITY .....</b>	<b>74</b>
<b>6.17</b>	<b>ISC USER PREFERENCES MANAGEMENT.....</b>	<b>74</b>
<b>6.18</b>	<b>RESUMING PREVIOUS CONTENT VIEWING .....</b>	<b>74</b>
<b>7.</b>	<b>ISC XDMS.....</b>	<b>76</b>
7.1	ISC USER PREFERENCE APPLICATION USAGE .....	76
7.2	ISC CONTENTS LIST APPLICATION USAGE .....	76
7.3	ISC GROUP XDM APPLICATION USAGE.....	76
7.3.1	Searching Active Content Viewing Group according to Content View .....	77
7.4	GROUP MANAGEMENT.....	77

7.4.1	Group Creation .....	77
7.4.2	Group Updates .....	77
<b>8.</b>	<b>ISC CPGATEWAY .....</b>	<b>78</b>
8.1	USER INTERACTION .....	78
<b>9.</b>	<b>SYSTEM CONCEPTS .....</b>	<b>80</b>
9.1	GENERAL CONCEPTS .....	80
9.1.1	Identification .....	80
9.1.2	Signalling over the SIP/IP Core .....	80
9.2	SECURITY .....	81
<b>APPENDIX A.</b>	<b>CHANGE HISTORY (INFORMATIVE).....</b>	<b>84</b>
A.1	APPROVED VERSION HISTORY .....	84
<b>APPENDIX B.</b>	<b>STATIC CONFORMANCE REQUIREMENTS (NORMATIVE).....</b>	<b>85</b>
B.1	SCR FOR ISC CLIENT.....	85
B.2	SCR FOR ISC SERVER .....	88
B.3	SCR FOR ISC CP GATEWAY .....	91
B.4	SCR FOR ISC XDMS.....	91
<b>APPENDIX C.</b>	<b>FLOWS (NORMATIVE).....</b>	<b>92</b>
C.1	REGISTRATION.....	92
C.1.1	ISC Client Registration .....	92
C.1.2	Registration Event Information Flows .....	93
C.2	1-1 CONTENT VIEWING AND COMMUNICATION .....	94
C.2.1	1-1 Content Viewing and Communication session .....	94
C.2.2	Change Content Viewing .....	96
C.2.3	Control Content Viewing.....	97
C.3	SELF CONTENT VIEWING.....	99
C.3.1	Change Content Viewing.....	99
C.3.2	Control Content Viewing.....	100
C.4	PRE-DEFINED GROUP CONTENT VIEWING AND COMMUNICATION SESSION MANAGEMENT .....	102
C.4.1	Establish a Content Viewing and Communication Session with a Pre-defined Group .....	102
C.4.2	Change Content Viewing .....	104
C.4.3	Control Content Viewing with a Pre-defined Group.....	105
C.5	AD-HOC GROUP CONTENT VIEWING AND COMMUNICATION SESSION MANAGEMENT .....	108
C.5.1	Establish a Content Viewing and Communication session with an Ad-hoc Group .....	108
C.5.2	Change Content Viewing .....	110
C.5.3	Control Content Viewing with a Ad-hoc Group .....	111
C.6	EXTENDING 1-1 CONTENT VIEWING AND COMMUNICATION TO AD-HOC GROUP CONTENT VIEWING AND COMMUNICATION .....	113
C.7	DELEGATING A CONTENT USAGE RIGHT TO OTHER ISC USERS .....	115
C.8	RECEIVING FULL CONTENTS LIST FROM CP.....	117
C.9	RECEIVING PERSONALIZED CONTENTS LIST.....	118
C.9.1	Receiving Personalized Contents List based on On-demand user preferences and user's context information .....	118
C.10	IMMERSIVE CONTENT VIEWING.....	119
C.10.1	Distribute Content Views according to Content View selection .....	119
C.10.2	Distribute Content Views according to selected Spatial Configuration .....	121
C.11	RESUME PREVIOUS CONTENT VIEWING .....	122
C.12	CONTENT INTEREST.....	125
C.12.1	Content Interest – Express Content Interest .....	125
C.12.2	Content Interest – announcing group creation .....	127
C.12.3	Content Interest – receive alert notification before content delivery .....	128
C.13	ISC XDMS .....	129
C.13.1	Management of ISC XML Documents by ISC Client .....	129
C.13.2	Management of ISC XML Documents by ISC Server.....	133
C.14	MULTI-DEVICE SUPPORTING .....	136
C.14.1	Content Viewing and Communication session when the initiator uses multiple devices .....	136

- C.14.2 Content Viewing and Communication session when the recipient using multi-devices ..... 138
- C.14.3 Resuming a Stopped Content Viewing with any of the ISC User’s devices ..... 140
- C.15 RECOMMENDING A CONTENT TO ANOTHER ISC USER ..... 141**
- C.16 USER AND GROUP SEARCHING ..... 143**
  - C.16.1 Searching Active Content Viewing Group according to Content View ..... 143
- C.17 RECEIVING FULL CONTENTS LIST FROM CP ..... 143**
  - C.17.1 Contents List structure ..... 143
- C.18 USER INTERACTION ..... 143**
- C.19 SET THE SOCIAL RELATIONSHIP ..... 146**
- C.20 SHARE THE SOCIAL ACTIVITY ..... 148**
- C.21 ASSOCIATED CONTENTS VIEWING ..... 150**
  - C.21.1 Deliver Associated Contents to the same device ..... 150
  - C.21.2 Deliver Associated Contents to a secondary device ..... 151
- C.22 RECEIVING ASSOCIATED CONTENTS LIST ..... 153**
- APPENDIX D. SCENARIO FOR EXPRESSING CONTENT INTEREST (INFORMATIVE) ..... 154**
- APPENDIX E. ISC CHARGING PRINCIPLES AND SCENARIOS (INFORMATIVE) ..... 156**
  - E.1 CHARGING PRINCIPLES FOR ISC EVENTS ..... 156**
  - E.2 CHARGING PRINCIPLES FOR ISC SESSIONS ..... 156**
- APPENDIX F. PARAMETERS TO BE PROVISIONED THE ISC-BASED SERVICE (NORMATIVE) ..... 158**
- APPENDIX G. RELEASE VERSION IN USER-AGENT AND SERVER HEADERS (NORMATIVE) ..... 159**
  - G.1 ISC VERSION 1.0 ..... 159**
- APPENDIX H. ISC-DEFINED SIP HEADER FIELDS ..... 160**
  - H.1 HEADER FIELD DEFINITIONS ..... 160**
    - H.1.1 ISCConvergenceID ..... 160
  - H.2 ABNF FOR THE ISC-DEFINED SIP HEADERS ..... 160**
- APPENDIX I. ISC FEATURE TAGS (NORMATIVE) ..... 161**
  - I.1 ISC FEATURE IDENTIFIERS ..... 161**
  - I.2 ISC CLIENT BEHAVIOUR ..... 161**
  - I.3 PROPOSED FORMATS FOR ISC FEATURE IDENTIFIERS ..... 161**
- APPENDIX J. USER INTERACTION MIME ..... 163**
  - J.1 STRUCTURE ..... 163**
- APPENDIX K. CONTENTS MIME ..... 164**
  - K.1 CONTENT INTEREST STRUCTURE ..... 164**

## Figures

- Figure 1: ISC Client registration ..... 92**
- Figure 2: ISC Server subscribes to the Registration Event Information ..... 93**
- Figure 3: X.Y.1 ..... 119**
- Figure 4: X.Y.2 ..... 121**
- Figure 5: Expressing Content Interest Flow ..... 125**
- Figure 6: Announcing Group Creation Flow ..... 127**
- Figure 7: Management of ISC XML Documents by ISC Client ..... 131**
- Figure 8: Management of ISC XML Documents by ISC Server ..... 134**
- Figure 9: Content Viewing and Communication when the initiator uses multiple devices ..... 136**

Figure 10: Content Viewing and Communication when the recipient using multi-devices..... 138

Figure 11: Searching for active Content Viewing Group ..... 143

Figure 12: Social Interaction between the ISC User and the Content Provider ..... 144

Figure 13: Social Relationship between the ISC Users ..... 146

Figure 14: Social Activity sharing between the ISC Users ..... 148

Figure 15: X.Y.1 ..... 150

Figure 16: X.Y.2 ..... 151

Figure 17: X.Y.1 ..... 153

Figure 18: Content Interest Scenario Flow ..... 154

## Tables

Table 1: Formats for ISC Feature identifiers..... 162

# 1. Scope

This document provides the technical specifications for the Immersive Social Centre (ISC) Enabler Version 1.0. The document covers the flows and procedures that enable a standardized integration of Content Viewing and Communication experience. Especially, it specifies how the Content Viewing Sessions and Communication Sessions can be established simultaneously among ISC Users as well as between the ISC User and Content Provider. The technical specifications are designed to fulfil the requirements and architecture that are described in [OMA-ISC-RD] and [OMA-ISC-AD] respectively.

As such, these technical specifications provide the formal descriptions of the ISC-1, ISC-2, ISC-3 and ISC-4 interfaces that have been identified in [OMA-ISC-AD]. Also, these technical specifications formally define the expected behaviour of the ISC Client, ISC Server and ISC CPGateway functional components that have been identified in [OMA-ISC-AD].



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## 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

**Pause Time** A Normal Play Time defined in [RFC2326] indicates the stream absolute position from the beginning of the content to the paused location.

### 3.3 Abbreviations

<b>3GPP</b>	3 <sup>rd</sup> Generation Partnership Project
<b>3GPP2</b>	3 <sup>rd</sup> Generation Partnership Project 2
<b>AUID</b>	Application Unique ID
<b>CM</b>	CoMmunication
<b>CPM</b>	Converged IP Messaging
<b>CV</b>	Content Viewing
<b>GRUU</b>	Globally Routable UA URI
<b>HTTP</b>	Hyper Text Transfer Protocol
<b>ICV</b>	Immersive Content Viewing
<b>IMS</b>	IP Multimedia Subsystem
<b>IP</b>	Internet Protocol
<b>ISC</b>	Immersive Social Centre
<b>ISIM</b>	IP Multimedia Services Identity Module
<b>MIME</b>	Multipurpose Internet Mail Extensions
<b>MMD</b>	3GPP2 Multimedia Domain
<b>MSRP</b>	Message Session Relay Protocol
<b>OMA</b>	Open Mobile Alliance
<b>PSK</b>	Pre-Shared Key
<b>RFC</b>	Request For Comments
<b>RTP</b>	Real-time Transport Protocol
<b>RTSP</b>	Real Time Streaming Protocol
<b>R-UIIM</b>	Removable – User Identity Module
<b>SDP</b>	Session Description Protocol
<b>SIP</b>	Session Initiation Protocol
<b>SRTP</b>	Secure Real-time Transport Protocol
<b>TLS</b>	Transport Layer Security
<b>UDP</b>	User Datagram Protocol

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<b>UIM</b>	User Identity Module
<b>URI</b>	Uniform Resource Identifier
<b>URL</b>	Uniform Resource Locator
<b>URN</b>	Uniform Resource Name
<b>UUID</b>	Universally Unique Identifier
<b>XCAP</b>	XML Configuration Access Protocol
<b>XDM</b>	XML Document Management
<b>XDMS</b>	XML Document Management Server
<b>XML</b>	Extensible Markup Language
<b>XQuery</b>	XML Query

## 4. ISC Introduction

The ISC Enabler provides a service-level framework (mainly leveraging SIP) to enable a standardized integration of content viewing and communication environment using multiple devices while providing an immersive (being-there, being-with) experience.

This technical document is based on the architecture defined in [OMA-ISC-AD]. It describes the Client-Server procedures over the ISC Interfaces. Some of the functions include:

- Functions of the ISC Server: Interaction with ISC Client, ISC XDMS, ISC CP Gateway and Supporting Server(s). The ISC Server provides the following functions: Content listing and content viewing, delivery of Primary Content and Associated Content, Communication, Social Interaction, Storage Management, Media-Handling, Multi-device Discovery
- Functions of the ISC Client: Interaction with ISC Server, Supporting Server(s) and supporting client functions
- Functions of the Supporting Server: Interaction with ISC Client, ISC Server, ISC XDMS, and ISC CP Gateway, providing supporting functions for: XDM, Presence, DM, CAB, Push, CPM, and ISC-specific supporting functions based on XDM and PRS
- Functions of ISC CP Gateway: Interaction with ISC Server and Supporting Server(s), supporting Social Interaction and Communication between ISC User and Content Provider.

### 4.1 Version 1.0

The version 1.0 of the ISC Enabler defines a framework that enables a standardized integration of content viewing and communication experience.

The core functionalities exposed by the ISC Enabler include: immersive content viewing, multi-device support, synchronization, social interaction and management, social communication capabilities, security and privacy aspects.

This version of the ISC Enabler covers the requirements marked as ISC V1.0 in the tables in Section 6 of [OMA-ISC-RD].

Some of the items supported in this release are:

The ISC Enabler supports interactivity with the content and one-to-one and one-to-many interpersonal multimedia communication from within the associated content viewing.

The ISC Enabler supports the creation of services that allow ISC Users to:

- do content viewing and communication (e.g., send invitation, post comments) with other users in parallel;
- synchronize content view with other user(s);
- share information of their content viewings (e.g., content name, same view or not) and presence information (e.g. available/not available for content viewing);
- get list of contents (personalized) available for viewing along with metadata and preview of the content;
- receive content views according to published device capability and spatial configuration;
- concurrently associate several devices with themselves;
- interact with the content (e.g., delegate content viewing rights);
- personalise their services by setting preferences;
- store content viewed and associated communication in the device(s).

## 5. Procedures at ISC Server

### 5.1 Contents Guide Function

#### 5.1.1 Contents List request handling

##### 5.1.1.1 Handle Contents List request

Upon receiving a SIP SUBSCRIBE request with the ISC ICSI feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ included in the Accept-Contact header and subscribing to the Contents List application usage for notifications on document changes with “xcap-diff” event package, the ISC XDMS:

1. SHALL check whether the authenticated originator’s ISC address is of an ISC User that is allowed to send the request. If the ISC/XDM Client is not authorized to send the request, the ISC XDMS 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. SHALL check if the feature tag included in the Accept-Contact header is supported. If it is not, the ISC XDMS SHALL reject the SIP SUBSCRIBE 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, continue with rest of the steps;

3. If a specific User Agent version must be supported, SHALL check the “User Agent” header field to determine if it supports the User Agent version as defined in Appendix G “Release Version in User-agent and Server headers” and if not, the ISC XDMS 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;

4. SHALL check if the P-Preferred-Service header field is present and carries the value of the ISC ICSI feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ or not.
  - A. If the value of ISC ICSI feature tag is ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ then the ISC XDMS 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.isc.cv-cm’;
  - B. Otherwise it MAY respond with a 403 ‘Forbidden’ SIP response;

Otherwise, continue with rest of the steps;

5. SHALL check if the body of the SIP SUBSCRIBE request is present and carries user preferences and/or user’s context information in its body, identifying <UserChoice> field whose <RefName> value is “FullContentsList” or “ReferOnDemandPref”.

6. SHALL acknowledge with a SIP 200 “OK” response towards SIP/IP Core;

Note: It is assumed that ISC XDMS has already received full Contents List from the ISC CP GATEWAY.

- A. SHALL set the Accept header field with the value “application/xcap-diff+xml”,
- B. subscribe to the “xcap-diff” event package;

The ISC XDMS SHALL generate SIP NOTIFY request according to the rules and procedures of the SIP/IP core with the following clarifications:

1. If the SIP SUBSCRIBE request carried the “UserChoice” field whose sub-element “RefName” value is “FullContentsList”; SHALL include the full Contents List document in the body of the SIP NOTIFY. Otherwise;
2. If the SIP SUBSCRIBE request carried the “UserChoice” field whose sub-element “RefName” value is “ReferOnDemandPref”;
  - a. SHALL apply the user preferences and/or user’s context information (e.g., to return associated contents related to current viewing/viewed content) received in the SIP SUBSCRIBE request on the full Contents List to generate Personalized Contents List and
  - b. SHALL include the personalized Contents List document in the body of the SIP NOTIFY
3. If there is a subscription for an “xcap-diff” event package, then SIP NOTIFY SHALL include updated (parts of) Contents List.
4. SHALL send the SIP NOTIFY towards the ISC/XDM Client including the Contents List document towards the SIP/IP Core.

## 5.1.2 Content Interest management

### 5.1.2.1 Handle Content Interest – User Express Interest

Upon receiving a SIP MESSAGE request with the ISC ICSI feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ and with ISC IARI feature tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.contentinterest’ included in the Accept-Contact header field, (directly via SIP/IP Core) the ISC Server:

1. SHALL check whether the authenticated originator’s ISC address is, of an ISC User that is authorized to send the request. If not authorized, the ISC Server 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 a specific User Agent version must be supported, SHALL check the “User Agent” header field to determine if it supports the User Agent version as defined in Appendix G “Release Version in User-agent and Server headers” and if not, the ISC Server Media 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. SHALL check
  - A. if the P-Preferred-Service header field is present and carries the value of the ISC ICSI feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’. In this case, the ISC Server 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.isc.cv-cm’; otherwise
  - B. if P-Asserted-Service header field is present and does not contain a value of the ISC ICSI feature tag of ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’, it MAY respond with a 403 ‘Forbidden’ SIP response;
4. SHALL check if the ISCConvergenceID received matches the locally stored ISCConvergenceID.
  - A. If it does not match, then the ISC Server:
    - i. SHALL store locally the ISCConvergenceID until the UserSetExpiryTime elapses;
    - ii. SHALL check if the body contains URI list. If yes, then the ISC Server extracts the terminating ISC Users address, generates a SIP MESSAGE according to the rules and procedures of [RFC5365] and sends the SIP MESSAGE towards each of the terminating ISC Clients with additional clarifications mentioned below. Otherwise, the ISC Server sends the SIP MESSAGE to the address of the terminating ISC User.



- iii. SHALL include an Accept-Contact header field with the ISC IARI feature tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.contentinterest’ percent encoded in a g.3gpp.icsi-ref media feature tag according to [3GPP TS 24.229] section 7.2A.9.2 “Coding of the IARI”;
- B. Otherwise, the ISC Server:
- i. SHALL forward the terminating ISC User’s response in SIP MESSAGE to the originating ISC User. Or
  - ii. MAY wait for the terminating ISC Users response until the UserSetExpiryTime lapses to aggregate, before forwarding the terminating ISC Users response in SIP MESSAGE to the originating ISC User with additional clarifications mentioned below. If there are more than one terminating ISC Users response then the MIME body SHALL include:
    - i). UserID element and the corresponding UserInterest element for each terminating ISC User response.

### 5.1.2.2 Handle Content Interest – Announcing Group Creation

Upon a pre-defined group being created in the Group XDMS with the <automatic-group-advertisement> element set to “true”, the Group XDMS generates Extended Group Advertisement message (SIP MESSAGE) to the members of the group to automatically announce the group being created following procedures described in [OMA-XDM-GROUP-TS] section 7.2 “Group XDMS generated Extended Group Advertisement”, with the additional clarifications described in this section.

1. SHALL include an Accept-Contact header field with the ISC ICSI Feature Tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ 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 set the P-Asserted-Service header field with the value of the ISC ICSI feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’;
3. SHALL include a User-Agent header field to indicate the OMA ISC release version of the ISC Client as specified in Appendix G “Release Version in User-agent and Server headers”;
4. SHALL include the ISConvergenceID header field with a newly generated value as specified in the Appendix H “ISC-specific SIP Headers”;
5. SHALL include Content-Type header field to “application/vnd.oma.isc.newgroupannouncement+xml”;
6. SHALL include the GroupID in the MIME body of the Group XDMS generated Extended Group Advertisement message (SIP MESSAGE) request;

## 5.2 Associated Content Function

### 5.2.1 Associated Contents Viewing Session Handling

Upon receiving a request from the Media Function to fetch Associated Contents (including metadata) related to the Primary Content, the ISC Associated Contents Function:

1. If an ISC session has not been established yet for the requested Associated Contents, the ISC Associated Contents Function SHALL generate a SIP INVITE request according to the rules and procedures of [RFC3261] with the following additional clarifications:
  - a. SHALL set the Request-URI to the address of ISC CP Gateway as provisioned to the ISC Server;
  - b. SHALL include the reference to the requested Associated Contents in the “ContentRef” element of the “application/ISC-content-request+xml”;
  - c. SHALL include a MIME SDP body as a SDP offer in the SIP INVITE request according to the rules and procedures of [RFC4566] and [RFC3264];
  - d. SHALL send the SIP INVITE request towards the ISC CP Gateway according to the rules and procedures of the SIP/IP Core;
2. Otherwise, the ISC Associated Contents Function SHALL fetch the requested Associated Contents via the established ISC Session

Upon receiving the SIP 200 “OK” response, the ISC Associated Contents Function SHALL establish a RTP session according to the rules and procedures of [RFC3550] for receiving the media related to the requested Associated Contents from the ISC CP Gateway.

## 5.3 Storage Function

In the mechanism of the network repository in the ISC Server, the Storage Function of the ISC Server SHALL manage the viewed contents (Primary Content and Associated Contents), user generated contents and Content Viewing Information

## 5.4 Multi-device Discovery Function

### 5.4.1 Multi-device Capability Management and Discovery

#### 5.4.1.1 Device Capability Information

The ISC Enabler supports the ISC User has one and/or more device(s). Each device has a unique ID, as per the rules of [RFC4479] and [OMA-DDS-Presence Data]. ISC Client’s identifier can be same with the device’s unique ID. Device capability information is static property set of the device about the device capabilities, including:

- Video codec properties, to decoding the video content, and
- Audio codec properties, to decoding the audio content, and
- Video rendering properties (e.g., display resolution), to playing the decoded video data, and
- Audio rendering properties, to playing the decoded audio data, and
- Encryption properties, to decrypting the media content if the media content is encrypted.

The device capability information above is contained in “device” components as described in the section “6.1.3 Device” of [OMA-DDS-Presence\_Data]. Each device has one “device” component in the [OMA-DDS-Presence\_Data] and its device capability information is stored in the component as sub-elements or attributes.

#### 5.4.1.2 Handle Multiple Devices Capabilities Publication

Upon receiving a publication request for device capability information from ISC Client, the Presence Server receives and manages the related information according to the rules and procedures as described in [OMA-TS-Presence].

#### 5.4.1.3 Handle Multiple Devices Capabilities Subscription

Upon receiving a subscription request for device capability information from ISC Client, the Multi-device Discovery Function acts as a Presence Server to process the request and to send relevant subscribed information to the subscriber, according to the rules and procedures as described in section “5.3.3 Presence Information Processing” of [OMA-TS-Presence] and according to the target user’s preferences and service policy.

### 5.4.2 Device Presence Information Management and Discovery

#### 5.4.2.1 Device Presence Information

The ISC Server’s Multi-device Discovery Function acts as Presence Server to manage the registration information (from SIP/IP Core) and the Device Presence Information (uploaded by ISC Clients which act as Presence Source) subject to the rules and procedures as described in [OMA-DDS-Presence\_Data]. The Device Presence Information of an ISC Client at least includes:

- Client identifier
- Client online status

- Content View selection information of the ISC Client, including
  - Content Name, that indicates the selected content, and its value is human-readable text
  - Content Identifier, that is used to uniquely indentify the selected content
- Content Viewing Information of the ISC Client, including
  - Content Name, that indicates the content being viewed, and its value is human-readable text
  - Content Identifier, that is used to uniquely indentify the content being viewed
  - Content URL, that indicates the URL of the content being viewed
  - Viewing Status, that indicates the viewing status of the content, which has four values “playing”, “stopped”, “paused”, or “closed”
  - Elapsed Time, that indicates the elapsed time of the content viewing

Client identifier is same as “deviceID” and is contained in “device” components as described in the section “6.1.3 Device” of [OMA-DDS-Presence\_Data].

Client online status is same as “registration-state” and is contained in “Application-specific Availability” components as described in the section “7.2 Application-specific Availability” of [OMA-DDS-Presence\_Data].

Content View selection information is contained in “Content-Selection-Information” as described in the section “7.25 Content Selection Information” of [OMA-DDS-Presence\_Data].

Content Viewing Information is contained in “Content Viewing Information” as described in the section “7.24 Content Viewing Information” of [OMA-DDS-Presence\_Data].

### **5.4.2.2 Handling the Device Presence Information Publication**

Upon receiving a publication request for Device Presence Information from ISC Client, the ISC Server Multi-device Discovery Function acts as a Presence Server to receive and manage the related information according to the rules and procedures as described in [OMA-TS-Presence].

### **5.4.2.3 Handling the Device Presence Information Subscription**

Upon receiving a subscription request for Device Presence Information from ISC Client, the Multi-device Discovery Function acts as a Presence Server to process the request and to send relevant subscribed information to the subscriber, according to the rules and procedures as described in section “5.3.3 Presence Information Processing” of [OMA-TS-Presence] and according to the target user’s preferences and service policy.

## **5.4.3 Multiple Devices Task Management**

### **5.4.3.1 Handles Resuming a Stopped Content Viewing with any of the ISC User’s devices**

The procedure for handling the publishing of Device Presence Information about the stopped and suspended Content Viewing from the ISC Client is same as the procedure which described in section 5.4.2.2 “Handling the Device Presence Information Updates”.

The procedure for handling the subscription of Device Presence Information about the stopped and suspended Content Viewing to the ISC Client is same as the procedure which described in section 5.4.2.3 “Handling the Device Presence Information Subscription”.

### **5.4.3.2 Notifies Client to Establish Communication Session (Originating Side)**

Note: See the flow listed in Appendix C.14.1 “Content Viewing and Communication session when the initiator uses multiple devices”.

If accepting an ISC/CPM Client's ask for notifying another ISC/CPM Client to support communication task, the ISC Server's Media Function generates a SIP MESSAGE according to the rules and procedures of [RFC5365], the SIP MESSAGE request SHALL include:

1. A Request-URI header field with value of the address of the target ISC/CPM Client;
2. The ISC User Address of the originating ISC/CPM Client that has been authenticated by the SIP/IP core as authenticated originator's ISC address;
3. An Accept-Contact header field with the ISC ICSI Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm' with ISC IARI Feature Tag 'urn:urn-7:3gpp-service.ims.iari.oma.isc.cm.recommendation' 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 section 7.2A.9.2 "Coding of the IARI";
4. An ISC ICSI feature tag 'urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm' 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;
5. A P-Preferred-Service header field with the value of the ISC ICSI feature tag 'urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm';
6. An MIME body that includes information about the communication task recommendation and related information, with the following clarifications:
  - a. The top-level Content-Type header field SHALL be set to 'application/vnd.oma.isc.cm.recommendation';
  - b. The body SHALL contain a sub-level MIME body with its Content-Type header field set to 'text/xml'. This sub-level MIME body SHALL contain the following fields:
    - i. "SessionType" element with value "cv-cm";
    - ii. "UsingMultipleClient" element with value "yes" (default value is "no");
    - iii. "CommunicationClientAddr" element with value as the client address of ISC/CPM Client to support the communication session;
    - iv. "ContentViewingClientAddr" element with value as the client address of ISC/CPM Client to support the content viewing session;
    - v. "ISCConvergenceID" element with value as the established content viewing session identifier for the initiator;

The ISC Server's Media Function forwards the SIP MESSAGE towards the target ISC/CPM Client according to the rules and procedures of the SIP/IP core.

#### 5.4.3.3 Notifies Client to Cancel Invite for Content Viewing Session (Terminating Side)

Note: See the flow listed in Appendix C.14.2 "Content Viewing and Communication session when the recipient using multi-devices".

The ISC Server's Media Function SHOULD support to cancel a sent SIP INVITE request for establishing content viewing session. When one content viewing session between one of the initiator's ISC Client(s) and one of the recipient's ISC Client(s) is established, the ISC Server's Media Function SHOULD send SIP CANCEL request to the recipient's other ISC Client(s) as the following conditions:

1. The recipient has multiple devices, and
2. The ISC Server's Media Function has sent SIP INVITE request(s) to the multiple devices (at least two) for establishing content viewing sessions, and
3. The recipient prefers to only one device supporting content viewing task, the setting is save in the recipient's user preference.

The ISC Server's Media Function adjusts to cancel a sent SIP INVITE request for establishing content viewing session, it generates a SIP CANCEL request according to the rules and procedures of [RFC 3261], and the SIP CANCEL request SHALL include:

1. A Request-URI header field with value of the address of the target ISC Client;
2. An Accept-Contact header field with the ISC ICSI Feature Tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ and with ISC IARI feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv.cancellation’ 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 section 7.2A.9.2 “Coding of the IARI”;
3. An ISC ICSI feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ 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. A P-Preferred-Service header field with the value of the ISC ICSI feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’;
5. An MIME body that includes information about the communication task recommendation and related information, with the following clarifications:
  - c. The top-level Content-Type header field SHALL be set to ‘application/vnd.oma.isc.cv.cancellation’;
  - d. The body SHALL contain a sub-level MIME body with its Content-Type header field set to ‘text/xml’. This sub-level MIME body SHALL contain the following fields:
    - i. “CVInviteIdentifier” element with value as an identifier indicating the sent SIP INVITE request for establishing content viewing session;
    - ii. “CancellationID” element with value as an identifier indicating the reason for the cancellation.

The ISC Server’s Media Function forwards the SIP CANCEL request towards the target ISC Client according to the rules and procedures of the SIP/IP core.

#### 5.4.3.4 Notifies Client to Cancel Communication Session (Terminating Side)

Note: See the flow listed in Appendix C.14.2 “Content Viewing and Communication session when the recipient using multi-devices”.

The ISC Server’s Communication Function (CPM) SHOULD support to cancel a sent SIP INVITE request for establishing communication session. When one communication session between one of the initiator’s CPM Clients and one of the recipient’s CPM Clients is established, the ISC Server’s Media Function SHOULD send SIP CANCEL request to the recipient’s other ISC Client(s) as the following conditions:

1. The recipient has multiple devices, and
2. The ISC Server’s communication Function (CPM) has sent SIP INVITE request(s) to the multiple devices (at least two) for establishing communication sessions, and
3. The recipient prefers to only one device supporting communication task, the setting is save in the recipient’s user preference.

The ISC Server’s Communication Function (CPM) SHALL cancel the related SIP INVITE request for establishing communication session with the rules and procedures as described in [CPM-CONV-TS].

## 5.5 Procedures at ISC Media Function and Communication Function

The ISC Server Communication Function directly refers to CPM Enabler server side functional components to support interactions between ISC Users and the Content Providers and also among other ISC Users.

## 5.5.1 Immersive Content Viewing Session Handling

### 5.5.1.1 Handle an Immersive Content Viewing Session Invitation Request

#### 5.5.1.1.1 Distribute Content Views according to Content View selection

Upon receiving a SIP INVITE request with ISC ICSI Feature Tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ and with the ISC IARI Feature Tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.icv-session’ included in the Accept-Contact header field corresponding to ISC Immersive Content Viewing Session, the ISC Media Function:

1. SHALL check the ISC User Address to find the authenticated address of the originating ISC User;
2. SHALL check if the feature tag included in the Accept-Contact header is supported. If it is not, the ISC Server 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, continue with rest of the steps;

3. If a specific User Agent version must be supported, SHALL check the “User Agent” header field to determine if it supports the User Agent version as defined in Appendix G “Release Version in User-agent and Server Headers (Normative)” and if not, the ISC Server 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;

4. SHALL check the MIME resource-list body to extract the target addresses of the ISC User’s Content View selection with the following additional clarifications:
  - a. The Media Function SHALL check if the MIME resource-list body includes an empty URI list. If the URI list is empty, the Media 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;

- b. The Media Function SHALL fetch all the existing ISC User’s Content View selection in the entries of MIME resource-lists body:
      - i. Content View identifier, if the entry contains the “?isc\_icv=id” parameter;
      - ii. ISC User’s field of view, if the entry contains the “?isc\_icv= fov” parameter;
      - iii. ISC User’s viewing distance, if the entry contains the “?isc\_icv=vd” parameter;
  5. SHALL fetch contents for mixing as the Content Views and Continuous Content Views according to the ISC User’s Content View selection with the following additional clarifications:
    - a. If an ISC session has not been established yet for the requested contents, the ISC Media Function SHALL follow the steps mentioned in Section 5.5.2 “Associated Contents Viewing Session Handling” using the address of ISC CP Gateway as provisioned to the ISC Server;
    - b. After contents session between ISC CPGateway and Content Provider is established, the ISC Media Function SHALL interact with the ISC CPGateway to fetch contents (including metadata) from Content Provider for mixing as Content Views and Continuous Content Views;
    - c. Otherwise, the ISC Media Function:
      - i. SHALL fetch the Content Views and Continuous Content Views directly if the Content View identifier is provided;
      - ii. SHALL select the media source to generate the Content Views and Continuous Content Views if the ISC User’s field of view or viewing distance is provided;

- d. When the ISC User selected contents relate to Primary Content being viewed, the Media Function SHALL interact with the Associated Content Function to fetch Associated Contents (including metadata) related to the Primary Content.
6. SHALL generate a SIP 200 “OK” response to the received initial SIP INVITE request according to the rules and procedures of [RFC3261];
7. SHALL include in the SIP 200 “OK” response a SDP body as a SDP answer according to the rules and procedures of [RFC4566] and [RFC3264];
8. SHALL send the SIP 200 “OK” response along the incoming signalling path according to rules and procedures of the SIP/IP core.

Upon receiving a SIP ACK request, the ISC Media Function

1. SHALL initiate the Media Plane according to the negotiated SDP.

Once the ISC Immersive Content Viewing Session is set up, the Media Function SHALL distribute Content Views and Continuous Content Views to the originating ISC Client.

#### 5.5.1.1.2 Distribute Content Views according to Spatial Configuration

Upon receiving a SIP INVITE request with ISC ICSI Feature Tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ and with the ISC IARI Feature Tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.icv-session’ included in the Accept-Contact header field corresponding to ISC Immersive Content Viewing Session, the ISC Media Function:

1. SHALL check the ISC User Address to find the authenticated address of the originating ISC User;
2. SHALL check if the feature tag included in the Accept-Contact header is supported. If it is not, the ISC Server 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, continue with rest of the steps;

3. If a specific User Agent version must be supported, SHALL check the “User Agent” header field to determine if it supports the User Agent version as defined in Appendix G “Release Version in User-agent and Server Headers (Normative)” and if not, the ISC Server 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;

4. SHALL check the MIME resource-list body to fetch the ISC User selected Spatial Configuration with the following additional clarifications:
  - a. The ISC Media Function SHALL check if the MIME resource-list body includes an empty URI list. If the URI list is empty, the ISC Media 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;

- b. The ISC Media Function SHALL extract all the target addresses of ISC Clients and corresponding spatial-based mappings between Content Views and ISC User’s device in the entries of MIME resource-lists body:
    - i. Mapping of spatial relationship, if the entry contains the “isc:spatialrelationship” attribute;
    - ii. Mapping of location, if the entry contains the “isc:location” attribute;
    - iii. Mapping of orientation, if the entry contains the “isc:orientation” parameter;
5. SHALL generate recommendation of spatial distribution for the Content Views and Continuous Content Views according to the ISC User selected Spatial Configuration with the following additional clarifications:

- a. The ISC Media Function SHALL follow the step 5 of Section 5.5.1.1.1 “Distribute Content Views according to Content View selection” to fetch contents for mixing as the Content Views and Continuous Content Views;
  - b. The ISC Media Function SHALL check the spatial properties of Content Views and Continuous Content Views and generate the spatial distribution among the ISC User’s devices for all available Content Views based on their spatial consistency with the ISC User selected Spatial Configuration;
6. SHALL generate a SIP 200 “OK” response to the received initial SIP INVITE request according to the rules and procedures of [RFC3261];
  7. SHALL include in the SIP 200 “OK” response a SDP body as a SDP answer according to the rules and procedures of [RFC4566] and [RFC3264];
  8. SHALL send the SIP 200 “OK” response along the incoming signalling path according to rules and procedures of the SIP/IP core.
  9. SHALL also establish an ISC Content Viewing session with the corresponding ISC Client according to the generated spatial distribution with the following additional clarifications:
    - a. If some Content Views should be delivered to one specific ISC Client according to the generated spatial distribution, the ISC Media Function SHALL follow the steps mentioned in Section 5.5.2 “Associated Contents Viewing Session Handling”:
      - i. Setting the Request-URI to the address of ISC Client as extracted from MIME <resource-lists> body in the Step 4.b;
      - ii. Including the reference to the Content Views in the “ContentRef” element of the “application/ISC-content-request+xml”;

Upon receiving a SIP ACK request, the ISC Media Function

2. SHALL initiate the Media Plane according to the negotiated SDP.

Once the ISC Immersive Content Viewing Session is set up, the ISC Media Function SHALL distribute Content Views and Continuous Content Views to the corresponding ISC Clients according to the generated spatial distribution.

### 5.5.1.1.3 Redistribute Content Views according to Spatial Configuration

Upon receiving a SIP re-INVITE request with ISC ICSI Feature Tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ and with the ISC IARI Feature Tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.icv-session’ included in the Accept-Contact header field corresponding to ISC Immersive Content Viewing Session, the ISC Media Function:

1. SHALL act as specified in section 5.5.1.1.2 “Distribute Content Views according to Spatial Configuration”.
2. MAY send the Immersive Content Viewing session notification to any authorized party which contains Content Views change information, if privacy rules allow it.

Once the ISC Immersive Content Viewing Session is modified, the ISC Media Function SHALL redistribute Content Views and Continuous Content Views to the corresponding ISC Clients according to the modified spatial distribution.

### 5.5.1.1.4 Redistribute Content Views according to Content View selection

Upon receiving a SIP re-INVITE request with ISC ICSI Feature Tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ and with the ISC IARI Feature Tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.icv-session’ included in the Accept-Contact header field corresponding to ISC Immersive Content Viewing Session, the ISC Media Function:

1. SHALL act as specified in section 5.5.1.1.1 “Distribute Content Views according to Content View selection”.
2. MAY send the Immersive Content Viewing session notification to any authorized party which contains Content Views change information, if privacy rules allow it.

Once the ISC Immersive Content Viewing Session is modified, the Media Function SHALL distribute Content Views and Continuous Content Views to the originating ISC Client.



## 5.5.2 Associated Contents Viewing Session Handling

### 5.5.2.1 Handle an Associated Contents Viewing Session Invitation Request

Upon receiving a SIP INVITE or SIP re-INVITE request with ISC ICSI Feature Tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ and with the ISC IARI Feature Tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.acv-session’ included in the Accept-Contact header field corresponding to ISC Associated Contents Viewing Session, the ISC Media Function:

1. SHALL check whether the authenticated originator’s ISC address is of an ISC User that is authorized to send the request. If the ISC Client is not authorized to send the request, the ISC Server 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. SHALL check if the feature tag included in the Accept-Contact header is supported. If it is not, the ISC Server 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, continue with rest of the steps;

3. If a specific User Agent version must be supported, SHALL check the “User Agent” header field to determine if it supports the User Agent version as defined in Appendix G “Release Version in User-agent and Server Headers (Normative)” and if not, the ISC Server 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;

4. SHALL check
  - a. if the P-Preferred-Service header field is present and carries the value of the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.self-cv’. In this case, the ISC Server 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.isc.self-cv’; otherwise
  - b. if P-Asserted-Service header field is present and does not contain a value of the ISC feature tag of ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.self-cv’, it MAY respond with a 403 ‘Forbidden’ SIP response;

Otherwise, continue with rest of the steps;

5. SHALL check the SIP INVITE or SIP re-INVITE request SDP attributes against service provider’s policies specified for the service and for the ISC User. If media types of SDP do not conform to the service provider’s policies, the ISC Server Media Function SHALL return a SIP 488 “Not Acceptable Here” response according to the rules and procedures of [RFC3261].

Otherwise, continue with rest of the steps;

6. SHALL check the MIME resource-list body to access the Content Viewing Information (e.g., content metadata and viewing progress) of the Primary Content with the following additional clarifications:
  - c. The ISC Media Function SHALL check if the MIME resource-list body includes an empty URI list. If the URI list is empty, the ISC Media 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. The ISC Media Function SHALL fetch the reference of Primary Content identified in the “ContentRef” of MIME resource-lists body and SHALL request the Multi-device Discovery Function to access the Content Viewing Information of the Primary Content

7. SHALL request the Associated Contents Function to fetch Associated Contents (including metadata) related to the Primary Content e.g. based on the collected Content Viewing Information.
8. SHALL generate a SIP 200 “OK” response to the received initial SIP INVITE or SIP re-INVITE request according to the rules and procedures of [RFC3261];
9. SHALL include in the SIP 200 “OK” response a SDP body as a SDP answer according to the rules and procedures of [RFC4566] and [RFC3264] before sending towards the ISC Client;
10. SHALL transmit the media related to the Associated Contents over an UDP/RTP channel towards the ISC Client;

## 5.5.3 Self Content Viewing

### 5.5.3.1 Handle Content Viewing and Change Content

Upon receiving a SIP INVITE or SIP re-INVITE request with the ISC ICSI feature tag “urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm” and with ISC IARI feature tag “urn:urn-7:3gpp-service.ims.iari.oma.isc.self-cv” included in the Accept-Contact header field to watch content, the ISC Server Media Function:

1. SHALL check whether the authenticated originator’s ISC address is of an ISC User that is authorized to send the request. If the ISC Client is not authorized to send the request, the ISC Server 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. SHALL check if the feature tag included in the Accept-Contact header is supported. If it is not, the ISC Server 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, continue with rest of the steps;
3. If a specific User Agent version must be supported, SHALL check the “User Agent” header field to determine if it supports the User Agent version as defined in Appendix G “Release Version in User-agent and Server Headers (Normative)” and if not, the ISC Server 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;
4. SHALL check
  - a. if the P-Preferred-Service header field is present and carries the value of the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’. In this case, the ISC Server 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.isc.cv-cm’; otherwise
  - b. if P-Asserted-Service header field is present and does not contain a value of the ISC feature tag of ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’, it MAY respond with a 403 ‘Forbidden’ SIP response;
 Otherwise, continue with rest of the steps;
5. SHALL check the SIP INVITE or SIP re-INVITE request SDP attributes against service provider’s policies specified for the service and for the ISC User. If media types of SDP do not conform to the service provider’s policies, the ISC Server Media Function SHALL return a SIP 488 “Not Acceptable Here” response according to the rules and procedures of [RFC3261].  
Otherwise, continue with rest of the steps;
6. SHALL include in the SIP 200 “OK” response a SDP body according to rules and procedures of [RFC3264] and [RFC3550] before sending towards the ISC Client;
7. SHALL transmit the media related to the Content identified in “ContentRef”, over an UDP/RTP channel towards the ISC Client;

### 5.5.3.2 Handle Content to self with User Controls

Upon receiving a SIP INVITE request with the ISC ICSI feature tag “urn:urn-7:3gpp-service.ims.icsi.oma.isc. cv-cm” and with ISC IARI feature tag “urn:urn-7:3gpp-service.ims.iari.oma.isc.self-cv” included in the Accept-Contact header field to watch content with user controls, the ISC Server Media Function:

1. SHALL check whether the authenticated originator’s ISC address is of an ISC User that is allowed to send the request. If the ISC Client is not authorized to send the request, the ISC Server 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. SHALL check if the feature tag included in the Accept-Contact header is supported. If it is not, the ISC Server 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, continue with rest of the steps;

3. If a specific User Agent version must be supported, SHALL check the “User Agent” header field to determine if it supports the User Agent version as defined in Appendix G “Release Version in User-agent and Server Headers (Normative)” and if not, the ISC Server 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;

4. SHALL check
  - A. if the P-Preferred-Service header field is present and carries the value of the ISC ICSI feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc. cv-cm’. In this case, the ISC Server 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.isc. cv-cm’; otherwise
  - B. if P-Asserted-Service header field is present and does not contain a value of the ISC ICSI feature tag of ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc. cv-cm’, it MAY respond with a 403 ‘Forbidden’ SIP response;

Otherwise, continue with rest of the steps;

5. SHALL check the SIP INVITE request SDP attributes against service provider’s policies specified for the service and for the ISC User. If media types of SDP do not conform to the service provider’s policies, the ISC Server Media Function SHALL return a SIP 488 “Not Acceptable Here” response according to the rules and procedures of [RFC3261].

Otherwise, continue with rest of the steps;

6. SHALL check the m-line is for setting up a RTSP session. Otherwise SHALL establish a RTP session according to the rules and procedures of [RFC3550];
7. SHALL include in the SIP 200 “OK” response a SDP body according to the rules and procedures of [RFC3264] and [RFC3550] before sending towards the ISC Client;

Upon receiving the RTSP PLAY request from the ISC Client, the ISC Server Media Function SHALL transmit the media related to the content identified in the ContentRef over an UDP/RTP channel towards the ISC Client;

Upon receiving the RTSP PAUSE request from the ISC Client, the ISC Server Media Function:

- a. SHALL temporarily stop transmitting the media related to the content identified in the ContentRef;

Upon receiving the RTSP PLAY request from the ISC Client, the ISC Server Media Function:

- a. SHALL start transmitting the media related to the content identified in the ContentRef from the paused position;

Upon receiving any other RTSP request from the ISC Client allowed by [RFC2326], the ISC Server Media Function SHALL perform according to the rules and procedures of [RFC2326] corresponding to the RTSP request.

## 5.5.4 1-1 Content Viewing and Communication session

The procedures for establishing 1-1 Content Viewing and Communication session, is described in this section.

### 5.5.4.1 Handle 1-1 Content Viewing session and Control Content

Upon receiving a SIP INVITE request with the ISC ICSI feature tag “urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm” and with ISC IARI feature tag “urn:urn-7:3gpp-service.ims.iari.oma.isc.1-1-cv-cm” included in the Accept-Contact header field to watch content with another ISC User, the ISC Server Media Function:

1. SHALL check whether the authenticated originator’s ISC address is of an ISC User that is allowed to send the request. If the ISC Client is not authorized to send the request, the ISC Server 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. SHALL check if the feature tag included in the Accept-Contact header is supported. If it is not, the ISC Server 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, continue with rest of the steps;

3. If a specific User Agent version must be supported, SHALL check the “User Agent” header field to determine if it supports the User Agent version as defined in Appendix G “Release Version in User-agent and Server Headers (Normative)” and if not, the ISC Server 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;

4. SHALL check
  - A. if the P-Preferred-Service header field is present and carries the value of the ISC ICSI feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’. In this case, the ISC Server 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.isc.cv-cm’; otherwise
  - B. if P-Asserted-Service header field is present and does not contain a value of the ISC feature tag of ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’, it MAY respond with a 403 ‘Forbidden’ SIP response;

Otherwise, continue with rest of the steps;

5. SHALL check the SIP INVITE request SDP attributes against service provider’s policies specified for the service and for the ISC User. If media types of SDP do not conform to the service provider’s policies, the ISC Server Media Function SHALL return a SIP 488 “Not Acceptable Here” response according to the rules and procedures of [RFC3261];

Otherwise, continue with rest of the steps;

6. SHALL behave as a B2BUA according to the rules and procedures of [RFC3261] for the duration of the ISC Session;
7. SHALL check the value included in the “Sync” element is “yes” in the MIME SDP body of the SIP INVITE request and then generate a SIP INVITE request according to the rules and procedures of [RFC3261] with the following clarifications. The ISC Server Media Function:
  - A. SHALL copy the received Request-URI;
  - B. SHALL copy the Contact header and the 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 of the SIP INVITE request;

- D. SHALL copy the values received in ISConvergenceID header field of the incoming request to a corresponding ISConvergenceID header field in the SIP INVITE request.
- E. SHALL include a MIME SDP body as an SDP offer in the SIP INVITE request based on the received SDP from the originating client.
- F. SHALL copy the “application/ISC-content-request+xml” MIME body of the incoming SIP INVITE request to the outgoing SIP INVITE request:

Otherwise, the ISC Server Media Function SHALL not forward the SIP INVITE request towards the terminating ISC Client.

- 8. SHALL send the SIP INVITE request towards the terminating ISC Client according to the rules and procedures of the SIP/IP core; If the recipient has multiple devices, the ISC Server Media Function SHALL fork and send the SIP INVITE request to the recipient’s every registered ISC Clients;
- 9. If the UsingMultipleClient element exists and its value is “yes”, and the CommunicationClientAddr element exists and its value is available in the MIME body of the incoming SIP INVITE request, SHALL continue with section 5.4.3.2 “Notifies Client to Establish Communication Session (Originating Side)”;

Upon receiving a SIP 200 “OK” response for content viewing, the ISC Server Media Function:

- 1. SHALL send a SIP 200 “OK” towards the originating and terminating ISC Client(s), according to the rules and procedures of the SIP/IP core;
- 2. Upon receiving the RTSP PLAY request from the ISC Client, the ISC Server Media Function SHALL establish a RTSP session towards the originating and terminating ISC Client(s) and transmit the media related to the Content identified in the ContentRef over an UDP/RTP channel.

Otherwise, continue with step 3.

Note: Upon receiving any other RTSP request from the ISC Client allowed by [RFC2326], the ISC Server Media Function SHALL perform subsequent actions according to the rules and procedures of [RFC2326].

- 3. SHALL transmit the media related to the Content identified in the ContentRef over an UDP/RTP channel towards the originating and terminating ISC Client(s);
- 4. SHALL check recipient’s user preference on the setting for multiple devices supporting. If the recipient only allows one device to support content viewing session, the ISC Server Media Function SHALL generate and send SIP CANCEL request(s) to all of the recipient’s registered other device(s) [see the section 5.4.3.3 “Notifies Client to Cancel Invite for Content Viewing Session (Terminating Side)”].

#### 5.5.4.2 Handle 1-1 Communication session

Refer 1-1 Communication Session procedures as specified in section “8.2.2.1 Handle a CPM Session Invitation” of [OMA-CPM-CONV-TS].

#### 5.5.4.3 Handle 1-1 Change Content Viewing session

Upon receiving a SIP re-INVITE request with the ISC ICSI feature tag “urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm” and with ISC IARI feature tag “urn:urn-7:3gpp-service.ims.iari.oma.isc.1-1-cv-cm” included in the Accept-Contact header field to change content being watched, the ISC Server Media Function SHALL refer to section “5.7.X Handle 1-1 Content Viewing session” with the following additional clarifications:

- 1. SHALL include the ISConvergenceID header field of the existing ISC Content Viewing session as specified in Appendix H “ISC-defined SIP Headers”;
- 2. SHALL include the reference of new requested content in the “ContentRef” element of the “application/ISC-content-request+xml”;
- 3. SHALL send the SIP re-INVITE request towards the originating and terminating ISC Client according to the rules and procedures of the SIP/IP Core;

NOTE: The ISC Server Media Function SHALL forward the originating ISC Client SIP re-INVITE request towards the terminating ISC Client only if the value included in the “Sync” element is “yes” in the MIME SDP body of the SIP re-INVITE request.

Upon receiving a SIP 200 “OK” response from the terminating ISC Client, the ISC Server Media Function SHALL establish a RTP session according to the rules and procedures of [RFC3550] and transmit the media related to the new Content identified in “ContentRef”.

## 5.5.5 Group Content Viewing and Communication session

The procedures for handling Content Viewing and Communication session within a group, is described in this section.

### 5.5.5.1 Handle Content Viewing session with a Pre-defined Group

Upon receiving a SIP INVITE request with the ISC ICSI feature tag “urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm” and with ISC IARI feature tag “urn:urn-7:3gpp-service.ims.iari.oma.isc.group-cv-cm” included in the Accept-Contact header field to watch content with members of ISC pre-defined group, the ISC Server Media Function:

1. SHALL check whether the authenticated originator’s ISC address is of an ISC User that is authorized to send the request. If the ISC Client is not authorized to send the request, the ISC Server 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. SHALL check if the feature tag included in the Accept-Contact header is supported. If it is not, the ISC Server 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, continue with rest of the steps;

3. If a specific User Agent version must be supported, SHALL check the “User Agent” header field to determine if it supports the User Agent version as defined in Appendix G “Release Version in User-agent and Server Headers (Normative)” and if not, the ISC Server 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;

4. SHALL check
  - A. if the P-Preferred-Service header field is present and carries the value of the ISC ICSI feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’. In this case, the ISC Server 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.isc.cv-cm’; otherwise
  - B. if P-Asserted-Service header field is present and does not contain a value of the ISC ICSI feature tag of ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’, it MAY respond with a 403 ‘Forbidden’ SIP response;

Otherwise, continue with rest of the steps;

5. SHALL check the SIP INVITE request SDP attributes against service provider’s policies specified for the service and for the ISC User. If media types of SDP do not conform to the service provider’s policies, the ISC Server Media Function SHALL return a SIP 488 “Not Acceptable Here” response according to the rules and procedures of [RFC3261];

Otherwise, continue with rest of the steps;

6. SHALL fetch the ISC pre-defined group members list and group policies from ISC XDMS according to procedures specified in [OMA-XDM-TS];
7. SHALL behave as a B2BUA according to the rules and procedures of [RFC3261] for the duration of the ISC Session;
8. SHALL generate a SIP INVITE request according to the rules and procedures of [RFC3261] with the following clarifications. The ISC Server Media Function:
  - a. SHALL copy the received Request-URI;

- b. SHALL copy the Contact header and the 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 of the SIP INVITE request;
  - d. SHALL copy the values received in ISConvergenceID header field of the incoming request to a corresponding ISConvergenceID header field in the SIP INVITE request.
  - e. SHALL include a MIME SDP body as an SDP offer in the SIP INVITE request based on the received SDP from the originating client.
  - f. SHALL copy the “application/ISC-content-request+xml” MIME body of the incoming SIP INVITE request to the outgoing SIP INVITE request:
9. SHALL send the SIP INVITE request towards each member of ISC Pre-defined group according to the rules and procedures of the SIP/IP core; If the member has multiple devices, the ISC Server Media Function SHALL fork and send the SIP INVITE request to the member’s every registered ISC Clients;
  10. If the UsingMultipleClient element exists and its value is “yes”, and the CommunicationClientAddr element exists and its value is available in the MIME body of the incoming SIP INVITE request, SHALL continue with section 5.4.3.2 “Notifies Client to Establish Communication Session (Originating Side)”;

Upon receiving a SIP 200 “OK” response for content viewing, the ISC Server Media Function:

1. SHALL send a SIP 200 “OK” response, according to the rules and procedures of the SIP/IP core;
2. SHALL transmit the media related to the Content identified in the ContentRef over an UDP/RTP channel towards each member of ISC pre-defined group;
3. SHALL check member’s user preference on the setting for multiple devices supporting. If the member only allows one device to support content viewing session, the ISC Server Media Function SHALL generate and send SIP CANCEL request(s) to all of the member’s registered other device(s) [see the section 5.4.3.3 “Notifies Client to Cancel Invite for Content Viewing Session (Terminating Side)”].

Note: Upon receiving any other RTSP request from the ISC Client allowed by [RFC2326], the ISC Server Media Function SHALL perform subsequent actions according to the rules and procedures of [RFC2326].

### 5.5.5.2 Handle Group Communication session

Refer 1-1 Communication Session procedures as specified in [OMA-CPM-CONV-TS] section “8.2.2.1 Handle a CPM Session Invitation”.

### 5.5.5.3 Handle Change Content Viewing with a pre-defined group

Upon receiving a SIP re-INVITE request with the ISC ICSI feature tag “urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm” and with ISC IARI feature tag “urn:urn-7:3gpp-service.ims.iari.oma.isc.group-cv-cm” included in the Accept-Contact header field to change content being watched in a pre-defined group, the ISC Server Media Function SHALL refer to section “5.5.5.1 Handle Content Viewing session with a Pre-defined Group” with the following additional clarifications:

1. SHALL include the ISConvergenceID header field of the existing ISC Content Viewing session as specified in Appendix H “ISC-defined SIP Headers”;
2. SHALL include the reference of new requested content in the “ContentRef” element of the “application/ISC-content-request+xml”;
3. SHALL send the SIP re-INVITE request towards each member of ISC pre-defined group according to the rules and procedures of the SIP/IP Core;

Upon receiving a SIP 200 “OK” response from the members of the pre-defined group, the ISC Server Media Function SHALL establish a RTP session according to the rules and procedures of [RFC3550] and transmit the media related to the new Content identified in ContentRef;

#### 5.5.5.4 Handle Content Viewing session with an Ad-hoc Group

Upon receiving a SIP INVITE request with the ISC ICSI feature tag “urn:urn-7:3gpp-service.ims.iari.oma.isc.cv-cm” and with ISC IARI feature tag “urn:urn-7:3gpp-service.ims.iari.oma.isc.group-cv-cm” included in the Accept-Contact header field to watch content with members of ISC Ad-hoc group, the ISC Server Media Function:

1. SHALL check whether the authenticated originator’s ISC address is of an ISC User that is authorized to send the request. If the ISC Client is not authorized to send the request, the ISC Server 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. SHALL check if the feature tag included in the Accept-Contact header is supported. If it is not, the ISC Server 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, continue with rest of the steps;

3. If a specific User Agent version must be supported, SHALL check the “User Agent” header field to determine if it supports the User Agent version as defined in Appendix G “Release Version in User-agent and Server Headers (Normative)” and if not, the ISC Server 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;

4. SHALL check
  - a. if the P-Preferred-Service header field is present and carries the value of the ISC ICSI feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’. In this case, the ISC Server 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.isc.cv-cm’; otherwise
  - b. if P-Asserted-Service header field is present and does not contain a value of the ISC ICSI feature tag of ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’, it MAY respond with a 403 ‘Forbidden’ SIP response;

Otherwise, continue with rest of the steps;

5. SHALL check the SIP INVITE request SDP attributes against service provider’s policies specified for the service and for the ISC User. If media types of SDP do not conform to the service provider’s policies, the ISC Server Media Function SHALL return a SIP 488 “Not Acceptable Here” response according to the rules and procedures of [RFC3261];

Otherwise, continue with rest of the steps;

6. SHALL behave as a B2BUA according to the rules and procedures of [RFC3261] for the duration of the ISC Session;

7. SHALL create an ISC Ad-hoc group for the URI list received from the ISC Client;

8. SHALL generate a SIP INVITE request according to the rules and procedures of [RFC3261] with the following clarifications. The ISC Server Media Function:

- a. SHALL copy the received Request-URI;
- b. SHALL copy the Contact header and the 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 of the SIP INVITE request;
- d. SHALL copy the values received in ISConvergenceID header field of the incoming request to a corresponding ISConvergenceID header field in the SIP INVITE request.
- e. SHALL include a MIME SDP body as an SDP offer in the SIP INVITE request based on the received SDP from the originating client.



- f. SHALL copy the “application/ISC-content-request+xml” MIME body of the incoming SIP INVITE request to the outgoing SIP INVITE request:
9. SHALL send the SIP INVITE request towards each member of the created Ad-hoc group according to the rules and procedures of the SIP/IP core; If the member has multiple devices, the ISC Server Media Function SHALL fork and send the SIP INVITE request to the member’s every registered ISC Clients
10. If the UsingMultipleClient element exists and its value is “yes”, and the CommunicationClientAddr element exists and its value is available in the MIME body of the incoming SIP INVITE request, SHALL continue with section 5.4.3.2 “Notifies Client to Establish Communication Session (Originating Side)”;

Upon receiving a SIP 200 “OK” response for content viewing, the ISC Server Media Function:

1. SHALL send a SIP 200 “OK” response, according to the rules and procedures of the SIP/IP core;
2. SHALL transmit the media related to the Content identified in the ContentRef over an UDP/RTP channel towards each member of ISC Ad-hoc group;
3. SHALL check member’s user preference on the setting for multiple devices supporting. If the member only allows one device to support content viewing session, the ISC Server Media Function SHALL generate and send SIP CANCEL request(s) to all of the member’s registered other device(s) [see the section 5.4.3.3 “Notifies Client to Cancel Invite for Content Viewing Session (Terminating Side)”].

Note: Upon receiving any other RTSP request from the ISC Client allowed by [RFC2326], the ISC Server Media Function SHALL perform subsequent actions according to the rules and procedures of [RFC2326].

### 5.5.5.5 Handle Group Communication session

Refer 1-1 Communication Session procedures as specified in [OMA-CPM-CONV-TS] section “8.2.2.1” Handle a CPM Session Invitation.

### 5.5.5.6 Handle Change Content Viewing with an Ad-hoc group

Upon receiving a SIP re-INVITE request with the ISC ICSI feature tag “urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm” and with ISC IARI feature tag “urn:urn-7:3gpp-service.ims.iari.oma.isc.group-cv-cm” included in the Accept-Contact header field to change content being watched in a ISC Ad-hoc group, the ISC Server Media Function SHALL refer to section “5.10.4 Handle Content Viewing session with a Ad-hoc Group” with the following additional clarifications:

1. SHALL include the ISConvergenceID header field of the existing ISC Content Viewing session as specified in Appendix H “ISC-defined SIP Headers”;
2. SHALL include the reference of new requested content in the “ContentRef” element of the “application/ISC-content-request+xml”;
3. SHALL send the SIP re-INVITE request towards each member of ISC Ad-hoc group according to the rules and procedures of the SIP/IP Core;

Upon receiving a SIP 200 “OK” response from the members of the ISC Ad-hoc group, the ISC Server Media Function SHALL establish a RTP session according to the rules and procedures of [RFC3550] and transmit the media related to the new Content identified in ContentRef;

### 5.5.6 Resuming Previous Content Viewing

When the ISC Server Media Function receives the RTSP PAUSE from the ISC Client, the ISC Server Media Function SHALL stop transmitting the media of the content over the UDP/RTP channel for the ISC Client.

When the ISC Server Media Function receives the RTSP PLAY from the ISC Client, the ISC Server Media Function SHALL start transmitting the media of the content over the UDP/RTP channel for the ISC Client from the Pause Time.

## 5.6 Social Function

### 5.6.1 Handle Delegation of a Content Usage Right

Upon receiving a SIP REFER request that contains a MIME Content-Type 'application/vnd.oma.isc.authinfo', to delegate a content usage right, the ISC Server:

1. SHALL check whether the authenticated originator's ISC address is of an ISC User that is allowed to send the request by checking the information about the ISC Client's right to use the content, contained in the body of the MIME Content-Type 'application/vnd.oma.isc.authinfo'. If the ISC Client is not authorized to send the request, the ISC Server 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. SHALL check if the feature tag included in the Accept-Contact header is supported. If it is not, the ISC Server 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, continue with rest of the steps;

3. If a specific User Agent version must be supported, SHALL check the "User Agent" header field to determine if it supports the User Agent version as defined in Appendix G "Release Version in User-agent and Server Headers (Normative)" and if not, the ISC Server 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;

4. SHALL generate a delegation request by initiating a CPM File Transfer Session (SIP INVITE) towards the terminating ISC Client(s) according to [OMA-CPM-CONV-TS] (Section 7.4.1, "CPM File Transfer Session Initiation") and the rules and procedures of [RFC3261] with the following clarifications and differences. The ISC Server:

- a. SHALL set the Request-URI to the target ISC User Address, if it is included in the Refer-To header of the received SIP REFER request;
- b. If the Refer-To header of the received SIP REFER request refers to a MIME resource-list body:
  - SHALL check from the MIME resource-list body that the maximum number of ISC Users allowed for this delegation request is not exceeded. If exceeded, the ISC Server SHALL return a SIP 486 "Busy Here" response and SHALL include a Warning header with the warning text set to "102 Too many target users" in the response according to the rules and procedures of [RFC3261].  
Otherwise, continue with the rest of the steps;
  - SHALL check if the MIME resource-list body includes an empty URI list. If the URI list is empty, the ISC Server 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;
  - 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 ISC Users that have to be invited for the delegation;
  - For each ISC User found in the member list, SHALL initiate a separate 1-1 CPM File Transfer Session (SIP INVITE) with the Request-URI set to that ISC User's address.
- c. SHALL include an Accept-Contact header field with the ISC IARI feature tag 'urn:urn-7:3gpp-service.ims.iari.oma.isc.social' if an Accept-Contact header field has been received in the incoming request, according to the rules and procedures of [RFC3841];
- d. SHALL include an Expires header with a positive value after which the SIP INVITE will timeout.

- e. SHALL include the option tag 'timer' in the Supported header field;
  - f. SHOULD include the Session-Expires header with the refresher parameter set to "uas" according to the rules and procedures of [RFC4028];
  - g. SHALL include the ISC Server's ISC address as the originator's ISC address;
  - h. SHALL include a Referred-By header field with the authenticated originator's ISC Address present in the incoming SIP REFER request;
  - i. SHALL include a MIME SDP body as an SDP offer by adding the relevant media attributes to the SDP as specified in [RFC5547] to initiate a file transfer, with the following additional considerations:
    - The "name", "size" and "type" sub-attributes of the "file-selector" attribute SHALL be included;
    - The "type" sub-attribute of "file-selector" attribute SHALL be set to "application/vnd.oma.isc.authinfo";
  - j. SHALL copy any information about the content to be delegated, as received in a MIME body of the incoming request, to a corresponding MIME body in the SIP INVITE request.
5. SHALL generate and send a 202 Accepted towards the requesting entity in response to the SIP REFER, according to the rules and procedures of the SIP/IP core.
  6. SHALL generate and send a first SIP NOTIFY towards the requesting entity in response to the implicit subscription created by the SIP REFER, according to the rules and procedures of [RFC3515].
  7. SHALL send the SIP INVITE request towards the terminating ISC Client(s) according to the rules and procedures of the SIP/IP core.

Upon receiving a SIP 200 "OK" response to the sent delegation request(s) (SIP INVITE) from a terminating ISC Client, the ISC Server:

1. SHALL generate and send a SIP CANCEL request towards any other terminating ISC Clients in order to cancel the initial delegation request, according to the rules and procedures of [RFC3261];
2. SHALL create a new content usage right information for the receiving ISC User that accepted the SIP INVITE;
3. SHALL generate an MSRP SEND request according to the rules and procedure of [RFC4975] with the following clarifications:
  - a. SHALL include the newly created content usage right information for the receiving ISC User who accepted the delegation request in a MIME body, as follows:
    - i. The Content-Type header SHALL be set to "application/vnd.oma.isc.authinfo";
    - ii. The Content-Transfer-Encoding header SHALL be set to "binary";
    - iii. The body of the MIME content SHALL contain the newly created content usage right information.
4. SHALL send the MSRP SEND request on the established MSRP connection.
5. When the MSRP SEND request has been sent and acknowledged, the ISC Server:
  - 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;
6. SHALL generate and send a SIP NOTIFY towards the originating side to inform that a receiving ISC User accepted the delegation request and that the delegation has been successful, following the procedures of [RFC3515], with the following clarifications. The SIP NOTIFY:
  - a. SHALL include the received SIP 200 "OK" response;
  - b. SHALL include the received SDP answer as received in the SIP 200 "OK" response, which contains among others the address of the terminating ISC Client who accepted the delegation request in the "Origin" (o=) field of the SDP answer, and the "file-selector" attribute with the "type" sub-attribute set to "application/vnd.oma.isc.authinfo".
7. SHALL delete the content usage right information of the ISC User who initially requested the delegation.

Upon receiving a SIP final response to the sent SIP INVITE(s) other than a SIP 200 "OK" response, the ISC Server SHALL:

1. If a SIP 302 “Temporarily Moved” response was received, the ISC Server SHALL send the SIP INVITE towards the address received in the Contact header of the response according to rules and procedures of [RFC3261];
2. If one of the following SIP responses is received from the a terminating ISC 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”, or
  - g. SIP 603 “Declined”, then
    - If there are remaining SIP INVITEs for which a final SIP response has not been received, the ISC Server SHALL wait until all responses to the sent requests are received.
    - If all SIP responses to the sent SIP INVITEs were received, and none of the responses was a SIP 200 “OK” response, the ISC Server SHALL generate and send a SIP NOTIFY that includes the aggregated received SIP responses towards the originating side, to inform that the delegation request was unsuccessful;

If the time indicated in the Expires header field of the outgoing SIP INVITE(s) is reached and no SIP 200 “OK” response was received from any of the terminating ISC Clients, the ISC Server:

1. SHALL generate and send a SIP NOTIFY that includes the aggregated SIP final responses received so far towards the originating side, to inform that the delegation request was unsuccessful;
2. SHALL generate and send a SIP CANCEL towards the ISC Clients that have not yet provided a SIP final response, following the procedures of [RFC3261].

## 5.6.2 User Interaction

Note: See flow in Appendix C.18 “User Interaction”.

Upon receiving a SIP MESSAGE request from the ISC CPGateway that contains a MIME Content-Type ‘application/vnd.oma.isc.userinteraction’, to support social interaction between the ISC User and the Content Provider, the ISC Server:

1. SHALL check whether the authenticated originator’s ISC address is of an ISC CPGateway that is allowed to send the request. If the ISC CPGateway is not authorized to send the request, the ISC Server 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 rule and procedure of [RFC3261].  
Otherwise, continue with rest of the steps;
2. SHALL check if the feature tag include in the Accept-Contact header is supported. If it is not, the ISC Server SHALL reject the SIP MESSAGE 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, continue with rest of the steps;
3. If a specific User Agent version must be supported, SHALL check the “User Agent” header field to determine if it supports the User Agent version as defined in Appendix G “Release Version in User-agent and Server Headers (Normative)” and if not, the ISC Server 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;
4. The ISC Server SHALL check the message size. If the maximum size of the message is larger than 1300 bytes, the ISC Server SHALL return a SIP 403 “Forbidden” response and SHALL include a Warning header with the warning

text set to “134 Maximum message size exceeded” in the response according to the rules and procedures of [RFC3261].

Otherwise, continue with rest of the steps;

5. SHALL check
  - a. if the P-Preferred-Service header field is present and carries the value of the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.social’. In this case, the ISC Server 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.isc.social’; or
  - b. if P-Asserted-Service header field is present and does not contain a value of the ISC feature tag of ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.social’, it MAY respond with a 403 ‘Forbidden’ SIP response;

Otherwise, continue with rest of the steps;

6. SHALL retrieves the user preference from ISC User Preferences Document [ISC 1.0 XDMS]

Upon receiving a SIP 200 “OK” response to the sent HTTP GET operation request from an ISC XDMS, the ISC Server:

7. SHALL use <receive-user-expression> element from ISC User Preferences Document [ISC 1.0 XDMS] to identify how to support the received user interaction request
  - a. When <receive-user-expression> element is “true”, the ISC Server SHALL forward SIP MESSAGE to the ISC Client.
  - b. When <receive-user-expression> element is “false”, the ISC Server SHALL reject the operation with a SIP “403 Forbidden” response to the ISC CPGateway.

Upon receiving a SIP 200 “OK” response to the sent user interaction request (SIP MESSAGE) from an ISC Client, the ISC Server:

1. SHALL send 200 “OK” SIP response code according to [RFC3428] to ISC CPGateway;

Upon receiving a SIP MESSAGE request from the ISC Client that contains a MIME Content-Type ‘application/vnd.oma.isc.userinteraction’, to deliver user expression between the ISC User and the Content Provider, the ISC Server:

1. SHALL forward the SIP MESSAGE towards the ISC CPGateway, according to the rules and procedures of the SIP/IP core.

Upon receiving a SIP 202 “Accepted” response to the sent user interaction request (SIP MESSAGE) from an ISC CPGateway, the ISC Server:

1. SHALL send 202 “Accepted” SIP response code according to [RFC3428] to ISC Client;

Upon receiving a SIP MESSAGE request from the ISC CPGateway that contains a MIME Content-Type ‘application/vnd.oma.isc.userinteraction’, to deliver the status of user interaction request between the ISC User and the Content Provider, the ISC Server:

1. SHALL forward the SIP MESSAGE towards the ISC Client, according to the rules and procedures of the SIP/IP core.

Upon receiving a SIP final response to the sent user interaction request (SIP MESSAGE) from an ISC Client, the ISC Server:

1. SHALL send 200 “OK” SIP response code according to [RFC3428] to ISC CPGateway;

### 5.6.3 Handle Content Interest – receive alert notification before content delivery

Upon lapse of the “ReminderTime” for sending an alert message (SIP MESSAGE) prior to delivery of the content, the ISC Server Contents Guide Function:

1. SHALL set the Request-URI to the address of the members of the ISC pre-defined group;

2. SHALL include an Accept-Contact header field with the ISC IARI Feature Tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.contentinterest’ percent encoded in a g.3gpp.icsi-ref media feature tag according to [3GPP TS 24.229] section 7.2A.9.2 “Coding of the IARI”;
3. SHALL set the P-Asserted-Service-header field with the value of the ISC IARI feature tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.contentinterest’;
4. SHALL include a User-Agent header field to indicate the OMA ISC release version of the ISC Client as specified in Appendix G “Release Version in User-agent and Server headers”;
5. SHALL include Content-Type header field to “application/vnd.oma.isc.content-alert+xml”;
6. SHALL include the following in the SIP MESSAGE body as per defined ISC MIME content for “application/vnd.oma.isc.content-alert+xml”:
  - a. ContentRef – the reference to the content;
  - b. StartTime – time for later delivery of content;
  - c. text alert information
7. SHALL include the ISCConvergenceID header field as received in the SIP MESSAGE request from the originating ISC User expressing content interest;
8. SHALL send the SIP MESSAGE towards each member of the ISC pre-defined group according to the rules and procedures of the SIP/IP Core;

## 5.6.4 Social Relationship

Note: See flow in Appendix C.19 “SET THE SOCIAL RELATIONSHIP”.

Upon detecting the closure of existing ISC session, the ISC Server

1. SHALL retrieves the ISC User Preference for creating the participants group and establishing the social relationship by using HTTP GET [RFC2616] from ISC User Preferences Document [ISC 1.0 XDMS]

Upon receiving a SIP 200 “OK” response to the sent HTTP GET operation request from an ISC XDMS, the ISC Server:

1. SHALL use <create-social-group> element from ISC User Preferences Document [ISC 1.0 XDMS] to identify whether or now the participants group is created
  - A. When <create-social-group> element is “true”, the ISC Server SHALL create the social-group based upon the contacts group which is fetched by CPM-MSG interface
  - B. When <create-social-group> element is “false”, the ISC Server SHALL NOT create the social group.

If the user preference <create-social-group> element is set as “true”, the ISC Server

1. SHALL fetch the single recipient or invited participants via IMAP FETCH request through the CPM-MSG interface from the CPM message server.

Upon receiving a “OK” response to the sent participants group fetch request (SIP MESSAGE), the ISC Server

2. SHALL creates the contacts group in the ISC XDMS and set the social relationship for each contact in the contacts group based on context (e.g. 2013.06.25\_Summer Workshop)(HTTP PUT)
3. SHALL receive a SIP 200 “OK” response.

Upon the fetched user preference from the previous procedure, the ISC Server

1. SHALL use <set-social-relation> element from ISC User Preferences Document [ISC 1.0 XDMS] to identify whether or now the social relationship of participants group is set
  - A. When <set-social-relation> element is “true”, the ISC Server SHALL set the social relationship for the contacts group which is fetched by CPM-MSG interface
2. When <create-social-group> element is “false”, the ISC Server SHALL NOT set the social relationship for the contacts group which is fetched by CPM-MSG interface

If the user preference <set-social-relation> element is set as “true”, the ISC Server

1. SHALL update the Request Handler Document for maintaining the status of social relationship request from ISC User Preferences Document [ISC 1.0 XDMS] and set the status as 'pending' if the delivery report needs(HTTP PUT)
2. SHALL generate the social relationship request by creating HTTP POST toward ISC XDMS and forward it to the ISC XDMS
3. SHALL receive a SIP 200 "OK" response.

### 5.6.5 Social Activity

Note: See flow in Appendix C.20 "SHARE THE SOCIAL ACTIVITY".

Upon detecting the closure of existing ISC session, the ISC Server

2. SHALL retrieves the ISC User Preference for storing the ISC Contents (HTTP GET) [RFC2616] from ISC User Preferences Document [ISC 1.0 XDMS]

Upon receiving a SIP 200 "OK" response to the sent HTTP GET operation request from an ISC XDMS, the ISC Server:

2. SHALL use <store-primary-contents> element from ISC User Preferences Document [ISC 1.0 XDMS] to identify whether or not the each Primary Contents, Associate Contents and Content Viewing Information is stored
  - A. When <store-primary-contents> element is "true", the ISC Server SHALL store the each Primary Contents, Associate Contents and Content Viewing Information in the ISC Server.
  - B. When <store-primary-contents> element is "false", the ISC Server SHALL NOT store the each Primary Contents, Associate Contents and Content Viewing Information in the ISC Server.

If the user preference <store-primary-contents> element is set as "true", the ISC Server

2. SHALL store the each Primary Contents, Associate Contents and Content Viewing Information in ISC Server

Upon receiving a "OK" response to the sent primary contents storage request, the ISC Server

3. SHALL use <store-specific-contents> element from ISC User Preferences Document [ISC 1.0 XDMS] to identify whether or not the specific contents is stored
  - A. When <store-specific-contents> element is "true", the ISC Server SHALL store the ISC Contents based on user specific context in the ISC Server.
  - B. When <store-specific-contents> element is "false", the ISC Server SHALL NOT store the ISC Contents based on user specific context

If the user preference <store-specific-contents> element is set as "true", the ISC Server

1. SHALL store the ISC Contents based on user specific context in the ISC Server.

Note: The ISC Server may store store the each Primary Contents, Associate Contents and Content Viewing Information as well as the ISC Contents based on user specific context in the ISC Server when both the user preference <store-primary-contents> element and <store-specific-contents> element are set as "true".

2. MAY notify the contents update to the ISC Client based upon the ISC User's subscription status.
3. SHALL check the user preference whether the newly created ISC Contents send to all or part of ISC User A's followers or event participants. The ISC Server SHALL
  - A. SHALL use <share-contents> element to identify which ISC User is targeted to receive the contents
    - i. When < share-contents> element is "true", the ISC Server SHALL send the newly created ISC Contents in the ISC Server to all participants in ISC session.
    - ii. When < share-contents> element is "false", the ISC Server SHALL NOT send the newly created ISC Contents in the ISC Server to all of ISC User's subscriber list
  - B. SHALL use <filter-set> element, if included, to filter the recipient to be shared from the ISC User (e.g. ISC User's profile followers)

4. SHALL update the Request Handler Document for maintaining the status of Social Activity sharing request from ISC User Preferences Document [ISC 1.0 XDMS and set the status as 'pending' if delivery report needs(HTTP PUT)
5. SHALL forward the ISC Contents (SIP MESSAGE) to the terminating ISC Server

Upon receiving forwarding request for ISC Contents, the terminating ISC Server

1. SHALL check the user preference whether ISC User B accepts/ receives/ confirms/rejects to receive it
2. SHALL fetch the corresponding ISC Contents from the originating ISC Server and stores it in the terminating ISC Server.
3. SHALL notify the contents update to the ISC Client based upon the ISC User's subscription status.

## 5.7 Registration and Authentication

Note: See the flows listed in Appendix C.1 "Registration".

### 5.7.1 Subscribe Registration Event Information Notifications

The ISC Server SHALL support receiving 3<sup>rd</sup> party registration from the SIP/IP core according to [3GPP TS 24.229] clause 5.4.1.7.

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

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 ISC User Address as 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.

When receiving the SIP 200 "OK" response from the SIP/IP core, the ISC Server SHALL wait for and receive the Registration Event Information Notifications.

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.

### 5.7.2 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 ISC Server:

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 ISC User Address. Otherwise, the ISC Server SHALL replace the old Registration Event Information with the Registration Event Information received in the SIP NOTIFY request.

### 5.7.3 Terminate the Subscription to Registration Event Information

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



## 6. Procedures at ISC Client

As the ISC Enabler directly refers to CPM Enabler for the Communication related activities by the ISC User (ex: interaction between the ISC Users and the Content provider and also among other ISC Users), the ISC Client interacts with the CPM Client for all ISC User Communication related activities.

### 6.1 Registration and Authentication

Note: See the flows listed in Appendix C.1 “Registration”.

The ISC Client SHALL, according to rules and procedures of [3GPP TS24.229] and the SIP/IP core,

- Perform SIP registration for the ISC Enabler to the SIP/IP core prior to using the ISC Enabler functionality. In a multi-device or multi-client context, the ISC Client also includes the Instance ID handling as per [3GPP TS24.229]; and,
- Maintain SIP registration for the ISC Enabler active by using a re-registration procedure while the ISC Enabler is being used; and,
- Terminate SIP registration for the ISC Enabler after the ISC Enabler functionality is no longer used.

NOTE: The SIP registration can be shared with other SIP based Enablers at the Device hosting the ISC Client.

The ISC Client SHALL indicate its Instance ID at SIP registration. The ISC User MAY assign a name to his/her device equipped with an ISC Client. The ISC Client SHALL indicate the user assigned name of the ISC Client and its ISC Client user agent capabilities as defined by [RFC3840] in the SIP registration. The ISC Client MAY also update its capabilities by re-registration when the capabilities have changed.

The ISC Client SHALL register with at least one ISC User Address.

### 6.2 Self Content Viewing

#### 6.2.1 Content Viewing

Note: See Flow in Appendix C.3.1 “Change Content Viewing”.

Upon receiving the request from the ISC User to watch content, the ISC Client SHALL generate a SIP INVITE request according to the rules and procedures of [RFC3261]. In particular, the ISC Client:

1. SHALL set the Request-URI to the address of the ISC Server;
2. SHALL include an Accept-Contact header field with the ISC Feature Tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ and with ISC IARI Feature Tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.self-cv’ 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 section 7.2A.9.2 “Coding of the IARI”;
3. SHALL include the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ 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 set the P-Preferred-Service header field with the value of the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’;
5. SHALL include the ISC User Address of the originating ISC Client that has been authenticated by the SIP/IP core as authenticated originator’s ISC address;
6. SHALL include a User-Agent header field to indicate the OMA ISC release version of the ISC Client as specified in Appendix G “Release Version in User-agent and Server headers”;
7. If a new ISC Content Viewing session is started, the ISC Client SHALL include a ISCCongvergenceID header field include a newly generated value as specified in Appendix H “ISC-defined SIP Headers”; Otherwise include the ISCCongvergenceID of the existing ISC Content Viewing session;

8. SHALL include 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.
9. SHALL include a MIME body with the Content-Type header field to “application/ISC-content-request+xml” including the reference to selected content in “ContentRef” in the SIP INVITE body;
10. SHALL send the SIP INVITE request towards the ISC Server Media Function according to the rules and procedures of the SIP/IP Core;

Upon receiving the SIP 200 “OK” response, the ISC Client SHALL establish a RTP session according to the rules and procedures of [RFC3550] for receiving the media related to the requested content from the ISC Server Media Function.

## 6.2.2 Change Content Viewing

Upon receiving the request from the ISC User to change the content being watched, the ISC Client SHALL generate a SIP re-INVITE request according to section 6.9.1 with the following additional clarifications:

1. SHALL include the ISCConvergenceID header field of the existing ISC Content Viewing session as specified in the Appendix H “ISC-defined SIP Headers”;
2. SHALL include the reference to new requested content in the “ContentRef” element of the “application/ISC-content-request+xml”;
3. SHALL send the SIP re-INVITE request towards the ISC Server Media Function according to the rules and procedures of the SIP/IP Core;

Upon receiving the SIP 200 “OK” response, the ISC Client SHALL modify the Media Plane according to the re-negotiated SDP for receiving the media related to the new content from the ISC Server Media Function;

## 6.2.3 Content Viewing with User Controls

Note: See Flow in Appendix C.3.2 “Control Content Viewing”.

Upon receiving the request from the ISC User to watch content with user controls, the ISC Client SHALL generate a SIP INVITE request according to the rules and procedures of [RFC3261]. In particular, the ISC Client:

1. SHALL set the Request-URI to the address of the ISC Server;
2. SHALL include an Accept-Contact header field with the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ and with ISC IARI feature tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.self-cv’ 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 section 7.2A.9.2 “Coding of the IARI”;
3. SHALL include the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ 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 set the P-Preferred-Service header field with the value of the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’;
5. SHALL include the ISC User Address of the originating ISC Client that has been authenticated by the SIP/IP core as authenticated originator’s ISC address;
6. SHALL include a User-Agent header field to indicate the OMA ISC release version of the ISC Client as specified in Appendix G “Release Version in User-agent and Server headers”;
7. If a new ISC Content Viewing session is started, the ISC Client SHALL include a ISCConvergenceID header field set to a newly generated value as specified in Appendix H “ISC-defined SIP Headers”; Otherwise include the ISCConvergenceID of the existing ISC Content Viewing session;
8. SHALL include 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.
9. SHALL include a MIME body with the Content-Type header field to “application/ISC-content-request+xml” including
  - a. the reference to selected content in “ContentRef”;

- b. the m-line for setting up a RTSP session according to the rules and procedures of [RFC2326] and [RFC4567].
10. SHALL send the SIP INVITE request towards the ISC Server Media Function according to the rules and procedures of the SIP/IP Core;

Upon receiving the SIP 200 “OK” in response, the ISC Client SHALL generate a RTSP PLAY request and establish a RTSP session according to the rules and procedures of [RFC2326] for receiving the media related to the requested content identified in the ContentRef with user controls from the ISC Server Media Function;

Upon receiving the request from the ISC User to pause the content being watched, the ISC Client:

- a. SHALL send a RTSP PAUSE request towards the ISC Server Media Function;
- b. SHALL temporarily stop receiving the media related to the content from the ISC Server Media Function over the established RTSP session;

Upon receiving the request from the ISC User to resume the content paused, the ISC Client:

- a. SHALL send a RTSP PLAY request towards the ISC Server Media Function;
- b. SHALL continue receiving the temporarily halted content from the position where it stopped, from the ISC Server Media Function over the established RTSP session;

Upon receiving any other request from the ISC User allowed by [RFC2326], the ISC Client SHALL send the corresponding RTSP request towards the ISC Server Media Function, and subsequent actions SHALL be performed according to the rules and procedures of [RFC2326].

## 6.3 Content Viewing and Communication session

### 6.3.1 1-1 Content Viewing and Communication (Originating Side)

Note: See Flow in Appendix C.2.1 “Content Viewing and Communication session”.

Upon receiving the request from the ISC User to watch content and communicate with another ISC User, the ISC Client SHALL generate a separate SIP INVITE request for content viewing according to the rules and procedures of [RFC3261]. In particular, the ISC Client:

1. SHALL set the Request-URI to the address of the target ISC User;
2. SHALL include an Accept-Contact header field with the ISC Feature Tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ and with ISC IARI Feature Tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.1-1-cv-cm’ 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 section 7.2A.9.2 “Coding of the IARI”;
3. SHALL include the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ 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 set the P-Preferred-Service header field with the value of the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’;
5. SHALL include the ISC User Address of the originating ISC Client that has been authenticated by the SIP/IP core as authenticated originator’s ISC address;
6. SHALL include a User-Agent header field to indicate the OMA ISC release version of the ISC Client as specified in Appendix G “Release Version in User-agent and Server headers”;
7. If a new ISC Content Viewing is started, the ISC Client SHALL include a ISCCConvergenceID header field set to a newly generated value as specified in Appendix H “ISC-defined SIP Headers”; Otherwise include the ISCCConvergenceID of the existing ISC Content Viewing;

Note: If a new Content Viewing is started along with the existing 1-1 Communication, then ISC Client SHALL interact with CPM Client to fetch CPM Conversation-ID and set ISCCConvergenceID header field to the value of CPM Conversation-ID which is used for existing 1-1 Communication;

8. SHALL include 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.
9. SHALL include a MIME body of the SIP INVITE request with the following clarifications:
  - a. SHALL set the Content-Type header field to “application/ISC-content-request+xml” including the reference to selected content in “ContentRef”;
  - b. SHALL include the “SessionType” element with the value as:
    - i. cv: if the ISC User’s request is for content viewing only;
    - ii. cv-cm: if the ISC User’s request is for content viewing and communication;
  - c. SHALL include the “Sync” element with the value as:
    - i. yes: if both ISC Users in 1-1 session should be synchronized in Content Viewing;
    - ii. no: if both ISC Users in 1-1 session do not want to synchronize their Content Viewing;
  - d. If the originating user sets using another ISC/CPM Client to support communication, the MIME body SHALL include:
    - i. “UsingMultipleClient” element with the value “yes” (default value is “no”);
    - ii. “CommunicationClientAddr” element with the value as the client address of ISC/CPM Client to support the communication session;
10. SHALL send the SIP INVITE request towards the ISC Server Media Function according to the rules and procedures of the SIP/IP Core;
11. If the “SessionType” is “cv-cm” and the originating user does not set using another ISC/CPM Client to support communication, continue with Section 6.3.3 “1-1 Communication (Originating Side)”.

Upon receiving the SIP 200 “OK” response for content viewing, the ISC Client SHALL establish a RTP session according to the rules and procedures of [RFC3550] for receiving the media related to the requested content from the ISC Server Media Function.

### 6.3.2 1-1 Content Viewing and Communication (Terminating Side)

Note: See Flow in Appendix C.2.1 “Content Viewing and Communication session”.

Upon receiving a SIP INVITE request for Content Viewing with the ISC IARI feature tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.1-1-cv-cm’ included in the Accept-Contact header field, the terminating ISC/CPM Client:

1. SHALL check if the value of “SessionType” element value is “cv-cm” in MIME SDP body with Content-Type header ‘application/ISC-content-request+xml’. If yes then the ISC Client SHOULD wait until SIP INVITE request for Communication with the CPM feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session’ and for the same “ISCCongvergenceID” is received before continuing with rest of the steps;
2. SHALL return:
  - a. a SIP 480 “Temporarily Unavailable” response if there are not enough resources to handle the ISC Session, or
  - b. a SIP 486 “Busy Here” response if the ISC User or ISC 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 408 “Timeout” response if the ISC User does not provide any input either until the value of the Expires header in the incoming SIP INVITE is reached (if present and time value is positive), or until a maximum time value set by the ISC Client is reached, whichever comes first. or
  - d. a SIP 603 “Declined” response if the ISC User has rejected the invitation.

Otherwise, continue with the rest of steps;

3. SHALL send the SIP 200 “OK” response according to rules and procedures of the SIP/IP core, with the following clarifications:

- a. The ISC Client SHALL process an incoming SDP and accept, modify or reject the Media Streams requested in the incoming SDP as defined by [RFC3264], [RFC3264] and [RFC3550] to include an answer SDP;
  - b. The ISC Client SHALL include the ISConvergenceID header field and value as received in the SIP INVITE request;
4. After sending a SIP 200 OK response to the originating ISC Client, the ISC Client SHALL establish a RTP session according to the rules and procedures of [RFC3550] for receiving the media related to the content from the ISC Server Media Function;

NOTE: The terminating ISC Client SHALL receive the same media related to the content specified in the “ContentRef” by the originating ISC Client from the ISC Server Media Function, only if the value included in the “Sync” element is “yes” in the MIME SDP body of the SIP re-INVITE request.

Upon receiving a SIP INVITE request for Communication with the CPM feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session’ included in the Accept-Contact header field, the terminating CPM Client SHALL refer to 1-1 Communication Session procedures as specified in [OMA-CPM-CONV-TS] section “7.3.2 Receiving a CPM Session Invitation”.

Note: The terminating CPM Client will setup an MSRP channel to exchange messages between the originating and terminating CPM Client(s);

The CPM Client SHALL interact with the ISC Client to render the media from Content Viewing and Communication Sessions together when the value of “ISConvergenceID” is same.

### 6.3.3 1-1 Communication (Originating Side)

Upon receiving the request from the ISC User to watch content and communicate with another ISC User, the ISC/CPM Client SHALL generate a SIP INVITE for communication request according to the rules and procedures of [RFC3261]. In particular, the CPM Client:

1. SHALL initiate a 1-1 Communication Session as specified in [OMA-CPM-CONV-TS] section “7.3.1.1 Initiating a CPM 1-1 Session” with the following clarifications:
2. SHALL include an Accept-Contact header field with the ISC IARI Feature Tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.1-1-cv-cm’ percent encoded in a g.3gpp.icsi-ref media feature tag according to [3GPP TS 24.229] section 7.2A.9.2 “Coding of the IARI”;
3. SHALL include the ISC IARI feature tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.1-1-cv-cm’ percent encoded as per [3GPP TS 24.229] section 7.2A.9.2 “Coding of the IARI” in a g.3gpp.icsi-ref media feature tag of the Contact header field;
4. If a new communication is started along with 1-1 content viewing, then the CPM Client SHALL set CPM Conversation-ID header field to the value of ISConvergenceID which is used for 1-1 content viewing as specified in the Appendix H “ISC-defined SIP Headers”;
5. SHALL include a MIME body of the SIP INVITE request with the following clarifications:
  - a. SHALL set the Content-Type header field to “application/ISC-content-request+xml” including the reference to selected content in “ContentRef”;
  - b. SHALL include the “SessionType” element with the value as:
    1. cv: if the ISC User’s request is for content viewing only;
    2. cv-cm: if the ISC User’s request is for content viewing and communication;

Upon receiving the SIP 200 “OK” response for communication, the CPM Client SHALL establish a MSRP session with ISC Server Communication Function according to the rules and procedures of [RFC4975] for exchanging messages with another ISC User;

### 6.3.4 1-1 Change Content Viewing (Originating Side)

Note: See Flow in Appendix C.2.2 “Change Content Viewing”.

Upon receiving the request from the ISC User to change the content being watched, the ISC Client SHALL generate a SIP re-INVITE request according to section 6.10.1 with the following additional clarifications:

1. SHALL include the ISConvergenceID header field of the existing ISC Content Viewing as specified in the Appendix H “ISC-defined SIP Headers”;
2. SHALL include a MIME body of the SIP re-INVITE request with the following clarifications:
  - a. SHALL include the reference to new requested content in the “ContentRef” element of the “application/ISC-content-request+xml”;
  - b. SHALL include the “Sync” element with the value as:
    1. yes: if both ISC Users in 1-1 session should be synchronized in Content Viewing;
    2. if both ISC Users in 1-1 session do not want to synchronize their Content Viewing;
3. SHALL send the SIP re-INVITE request towards the ISC Server Media Function according to the rules and procedures of the SIP/IP Core;

Upon receiving the SIP 200 “OK” response, the ISC Client SHALL modify the Media Plane according to the re-negotiated SDP for receiving the media related to the new content from the ISC Server Media Function.

### 6.3.5 1-1 Change Content Viewing (Terminating Side)

Note: See Flow in Appendix C.2.2 “Change Content Viewing”.

Upon receiving a SIP re-INVITE request for Change Content Viewing with the ISC IARI feature tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.1-1-cv-cm’ included in the Accept-Contact header field, the terminating ISC Client SHALL perform procedures according to section 6.10.2 “1-1 Content Viewing (Terminating Side)” with the following clarifications:

1. SHALL auto-accept and send the SIP 200 “OK” response according to rules and procedures of the SIP/IP core including the ISConvergenceID header field and value as received in the SIP INVITE request;
2. SHALL modify the Media Plane according to the re-negotiated SDP of the new content.

NOTE: The terminating ISC Client SHALL receive the same media related to the content specified in the “ContentRef” by the originating ISC Client from the ISC Server Media Function, only if the value included in the “Sync” element is “yes” in the MIME SDP body of the SIP re-INVITE request.

### 6.3.6 Control Content Viewing and Communication (Originating Side)

Note: See Flow in Appendix C.2.3 “Control Content Viewing”.

When the ISC Client receives a request from the ISC User to watch content with other ISC User, the ISC Client SHALL generate a separate SIP INVITE request for Content Viewing according to the rules and procedures of [RFC3261]. In this SIP INVITE request, the ISC Client:

1. SHALL set the Request-URI to the address of the target ISC User;
2. SHALL include an Accept-Contact header field with the ISC Feature Tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ and with ISC IARI Feature Tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.1-1-cv-cm’ 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 section 7.2A.9.2 “Coding of the IARI”;
3. SHALL include the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ 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 set the P-Preferred-Service header field with the value of the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’;
5. SHALL include the ISC User Address of the originating ISC Client that has been authenticated by the SIP/IP core as authenticated originator's ISC address;

6. SHALL include a User-Agent header field to indicate the OMA ISC release version of the ISC Client as specified in Appendix G “Release Version in User-agent and Server headers”;
7. If a new ISC Content Viewing is started, the ISC Client SHALL include a ISCCongvergenceID header field set to a newly generated value as specified in Appendix H “ISC-defined SIP Headers”; Otherwise include the ISCCongvergenceID of the existing ISC Content Viewing;

Note: If a new Content Viewing is started along with the existing 1-1 Communication, then ISC Client SHALL interact with CPM Client to fetch CPM Conversation-ID and set ISCCongvergenceID header field to the value of CPM Conversation-ID which is used for existing 1-1 Communication;

8. SHALL include 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 with the following clarifications:
  - i. the m-line for setting up a RTSP session according to the rules and procedures of [RFC2326] and [RFC4567];
9. SHALL include a MIME body of the SIP INVITE request with the following clarifications:
  - a. SHALL set the Content-Type header field to “application/ISC-content-request+xml” including the reference to selected content in “ContentRef”;
  - b. SHALL include the “SessionType” element with the value as:
    1. cv: if the ISC User’s request is for content viewing only;
    2. cv-cm: if the ISC User’s request is for content viewing and communication;
10. SHALL send the SIP INVITE towards the ISC Server Media Function according to the rules and procedures of the SIP/IP Core;
11. If “SessionType” element value is “cv-cm” in MIME SDP body with Content-Type header ‘application/ISC-content-request+xml’ and the value of “ISCCongvergenceID” is same as in other SIP INVITE.
  - a. Refer 1-1 Communication Session procedures as specified in [OMA-CPM-CONV-TS] section “7.3.1.1 Initiating a CPM 1-1 Session” with the following clarifications. The CPM Client:
    - i. SHALL include an Accept-Contact header field with the ISC IARI Feature Tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.1-1-cv-cm’ percent encoded in a g.3gpp.icsi-ref media feature tag according to [3GPP TS 24.229] section 7.2A.9.2 “Coding of the IARI”;
    - ii. SHALL include the ISC IARI feature tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.1-1-cv-cm’ percent encoded as per [3GPP TS 24.229] section 7.2A.9.2 “Coding of the IARI” in a g.3gpp.icsi-ref media feature tag of the Contact header field;
    - iii. SHALL set CPM Conversation-ID header field to the value of ISCCongvergenceID which is used for group content viewing as specified in the Appendix H “ISC-defined SIP Headers”;
    - iv. SHALL include a MIME body of the SIP INVITE request:
      1. SHALL set the Content-Type header field to “application/ISC-content-request+xml” including the reference to selected content in “ContentRef”;
    - v. SHALL include the “SessionType” element with the value as:
      1. cv: if the ISC User’s request is for content viewing only;
      2. cv-cm: if the ISC User’s request is for content viewing and communication;

Note: Upon receiving the SIP 200 “OK” the originating CPM Client will setup an MSRP channel to exchange messages between the originating and terminating CPM Client(s);

Upon receiving the SIP 200 “OK” in response, the ISC Client SHALL establish a RTSP session according to the rules and procedures of [RFC2326];

- a. Upon receiving the request from the ISC User to start receiving the content

- i. the ISC Client SHALL generate RTSP PLAY according to the rules and procedures of [RFC2326];
- ii. SHALL receive the content from the ISC Server Media Function over the established RTSP session;
- b. Upon receiving the request from the ISC User to pause the content being watched, the ISC Client:
  - i. SHALL send a RTSP PAUSE request towards the ISC Server Media Function;
  - ii. SHALL temporarily stop receiving the media related to the content from the ISC Server Media Function over the established RTSP session;
- c. Upon receiving the request from the ISC User to resume the content paused, the ISC Client:
  - i. SHALL send a RTSP PLAY request towards the ISC Server Media Function;
  - ii. SHALL continue receiving the temporarily halted content from the position where it stopped, from the ISC Server Media Function over the established RTSP session;

Note: Upon receiving any other request from the ISC User allowed by [RFC2326], the ISC Client SHALL send the corresponding RTSP request towards the ISC Server Media Function, and subsequent actions SHALL be performed according to the rules and procedures of [RFC2326].

### 6.3.7 1-1 Control Content Viewing (Terminating Side)

Note: See Flow in Appendix C.2.3 “Control Content Viewing”.

The terminating ISC Client SHALL stop receiving the media related to the content from the ISC Server Media Function over the established RTSP session, when the originating ISC Client sends a RTSP PAUSE request towards the ISC Server Media Function;

The terminating ISC Client SHALL start continue receiving the temporarily halted from the position where it stopped from the ISC Server Media Function over RTSP session, when the originating ISC Client sends a RTSP PLAY request towards the ISC Server Media Function.

Note: The ISC Server upon receiving any other RTSP request from the originating ISC Client allowed by [RFC2326], the ISC Server Media Function SHALL perform subsequent actions according to the rules and procedures of [RFC2326] towards the originating and terminating ISC Clients.

## 6.4 Group Content Viewing and Communication session

### 6.4.1 Content Viewing and Communication with a Pre-defined Group (Originating Side)

Note: See Flow in Appendix C.4.1 “Establish a Content Viewing and Communication Session with a Pre-defined Group”.

Upon receiving the request from the ISC User to watch content and communicate with members of ISC pre-defined group, the ISC Client SHALL generate a SIP INVITE for content viewing request according to the rules and procedures of [RFC3261]. In particular, the ISC Client:

1. SHALL set the Request-URI to the address of the ISC pre-defined group;
2. SHALL include an Accept-Contact header field with the ISC Feature Tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ and with ISC IARI Feature Tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.group-cv-cm’ 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 section 7.2A.9.2 “Coding of the IARI”;
3. SHALL include the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ 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 set the P-Preferred-Service header field with the value of the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’;
5. SHALL include the ISC User Address of the originating ISC Client that has been authenticated by the SIP/IP core as authenticated originator's ISC address;



6. SHALL include a User-Agent header field to indicate the OMA ISC release version of the ISC Client as specified in Appendix G “Release Version in User-agent and Server headers”;
7. If a new ISC Content Viewing is started, the ISC Client SHALL include a ISConvergenceID header field set to a newly generated value as specified in Appendix H “ISC-defined SIP Headers”; Otherwise include the ISConvergenceID of the existing ISC Content Viewing;
 

Note: If a new Content Viewing is started along with the existing pre-defined Group Communication, then ISC Client SHALL interact with CPM Client to fetch CPM Conversation-ID and set ISConvergenceID header field to the value of CPM Conversation-ID which is used for existing pre-defined Group Communication;
8. SHALL include 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.
9. SHALL include a MIME body of the SIP INVITE request with the following clarifications:
  - a. SHALL set the Content-Type header field to “application/ISC-content-request+xml” including the reference to selected content in “ContentRef”;
  - b. SHALL include the “SessionType” element with the value as:
    3. cv: if the ISC User’s request is for content viewing only;
    4. cv-cm: if the ISC User’s request is for content viewing and communication;
10. SHALL send the SIP INVITE request towards the ISC Server Media Function according to the rules and procedures of the SIP/IP Core;
11. Continue with Section 6.4.5 “Group Communication (Originating Side)”, only if the “SessionType” is “cv-cm”.

Upon receiving the SIP 200 “OK” response, the ISC Client SHALL establish a RTP session according to the rules and procedures of [RFC3550] for receiving the media related to the requested content from the ISC Server Media Function.

## 6.4.2 Content Viewing and Communication with a Pre-defined Group (Terminating Side)

Note: See Flow in Appendix C.4.1 “Establish a Content Viewing and Communication session with a Pre-defined Group”.

Upon receiving a SIP INVITE request for Content Viewing with the ISC IARI feature tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.group-cv-cm’ included in the Accept-Contact header field, the terminating ISC Client:

1. SHALL check if the value of “ISConvergenceID” and “SessionType” element value is “cv-cm” in MIME SDP body with Content-Type header ‘application/ISC-content-request+xml’. If yes then the ISC Client SHOULD wait until SIP INVITE request for Communication with the CPM feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session’ and for the same “ISConvergenceID” is received before continuing with rest of the steps;
2. SHALL return:
  - a. a SIP 480 “Temporarily Unavailable” response if there are not enough resources to handle the ISC Session, or
  - b. a SIP 486 “Busy Here” response if the ISC User or ISC 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 408 “Timeout” response if the ISC User does not provide any input either until the value of the Expires header in the incoming SIP INVITE is reached (if present and time value is positive), or until a maximum time value set by the ISC Client is reached, whichever comes first.
  - d. a SIP 603 “Declined” response if the ISC User has rejected the invitation.

Otherwise, continue with the rest of steps;

3. SHALL send the SIP 200 “OK” response according to rules and procedures of the SIP/IP core, with the following clarifications:

- a. The ISC Client SHALL process an incoming SDP and accept, modify or reject the Media Streams requested in the incoming SDP as defined by [RFC3264], [RFC3264] and [RFC3550] to include an answer SDP;
  - b. The ISC Client SHALL include the ISConvergenceID header field and value as received in the SIP INVITE request;
4. After sending a SIP 200 OK response to the originating ISC Client, the ISC Client SHALL establish a RTP session according to the rules and procedures of [RFC3550] for receiving the media related to the content from the ISC Server Media Function;

Upon receiving a SIP INVITE request for Communication with the CPM feature tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' included in the Accept-Contact header field, the terminating CPM Client SHALL refer to Group Communication Session procedures as specified in [OMA-CPM-CONV-TS] section "7.3.2 Receiving a CPM Session Invitation".

Note: The terminating CPM Client will setup an MSRP channel can be setup to exchange messages between the members of ISC pre-defined group;

The CPM Client SHALL interact with the ISC Client to render the contents from Content Viewing and Communication Sessions together when the value of "ISConvergenceID" is same.

### 6.4.3 Content Viewing and Communication with a Pre-defined/Adhoc Group (Terminating Side)

Note: See Flow in Appendix C.4.1 "Establish a Content Viewing and Communication session with a Pre-defined Group".

And see Flow in Appendix C.5.3 "Control Content Viewing with a Ad-hoc Group".

Upon receiving a SIP INVITE request for Content Viewing with the ISC IARI feature tag 'urn:urn-7:3gpp-service.ims.iari.oma.isc.group-cv-cm' included in the Accept-Contact header field, the terminating ISC Client:

1. SHALL check if the value of "SessionType" element value is "cv-cm" in MIME SDP body with Content-Type header 'application/ISC-content-request+xml'. If yes then the ISC Client SHOULD wait until SIP INVITE request for Communication with the CPM feature tag 'urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session' and for the same "ISConvergenceID" is received before continuing with rest of the steps;
2. SHALL return:
  - a. a SIP 480 "Temporarily Unavailable" response if there are not enough resources to handle the ISC Session, or
  - b. a SIP 486 "Busy Here" response if the ISC User or ISC 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 408 "Timeout" response if the ISC User does not provide any input either until the value of the Expires header in the incoming SIP INVITE is reached (if present and time value is positive), or until a maximum time value set by the ISC Client is reached, whichever comes first.
  - d. a SIP 603 "Declined" response if the ISC User has rejected the invitation.

Otherwise, continue with the rest of steps;

3. SHALL send the SIP 200 "OK" response according to rules and procedures of the SIP/IP core, with the following clarifications:
  - a. The ISC Client SHALL process an incoming SDP and accept, modify or reject the Media Streams requested in the incoming SDP as defined by [RFC3264], [RFC3264] and [RFC3550] to include an answer SDP;
  - b. The ISC Client SHALL include the ISConvergenceID header field and value as received in the SIP INVITE request;
4. After sending a SIP 200 OK response to the originating ISC Client, the ISC Client SHALL establish a RTSP session according to the rules and procedures of [RFC3550] for receiving the media related to the content from the ISC Server Media Function;

Upon receiving a SIP INVITE request for Communication with the CPM feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session’ included in the Accept-Contact header field, the terminating CPM Client SHALL refer to Group Communication Session procedures as specified in [OMA-CPM-CONV-TS] section “7.3.2 Receiving a CPM Session Invitation”.

Note: The terminating CPM Client will setup an MSRP channel can be setup to exchange messages between the members of ISC pre-defined group;

The CPM Client SHALL interact with the ISC Client to render the contents from Content Viewing and Communication Sessions together when the value of “ISCConvergenceID” is same.

## 6.4.4 Content Viewing and Communication with a Pre-defined Group – Control Content (Originating Side)

Note: See Flow in Appendix C.4.3 “Control Content Viewing with a Pre-defined Group”.

Upon receiving the request from the ISC User to watch content and communicate with members of ISC pre-defined group, the ISC Client SHALL generate a SIP INVITE for content viewing request according to the rules and procedures of [RFC3261]. In particular, the ISC Client:

1. SHALL set the Request-URI to the address of the ISC pre-defined group;
2. SHALL include an Accept-Contact header field with the ISC Feature Tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ and with ISC IARI Feature Tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.group-cv-cm’ 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 section 7.2A.9.2 “Coding of the IARI”;
3. SHALL include the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ 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 set the P-Preferred-Service header field with the value of the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’;
5. SHALL include the ISC User Address of the originating ISC Client that has been authenticated by the SIP/IP core as authenticated originator’s ISC address;
6. SHALL include a User-Agent header field to indicate the OMA ISC release version of the ISC Client as specified in Appendix G “Release Version in User-agent and Server headers”;
7. If a new ISC Content Viewing is started, the ISC Client SHALL include a ISCConvergenceID header field set to a newly generated value as specified in Appendix H “ISC-defined SIP Headers”; Otherwise include the ISCConvergenceID of the existing ISC Content Viewing;

Note: If a new Content Viewing is started along with the existing pre-defined Group Communication, then ISC Client SHALL interact with CPM Client to fetch CPM Conversation-ID and set ISCConvergenceID header field to the value of CPM Conversation-ID which is used for existing pre-defined Group Communication;

8. SHALL include 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 with the following clarifications:
  - a. the m-line for setting up a RTSP session according to the rules and procedures of [RFC2326] and [RFC4567];
9. SHALL include a MIME body of the SIP INVITE request with the following clarifications:
  - a. SHALL set the Content-Type header field to “application/ISC-content-request+xml” including the reference to selected content in “ContentRef”;
  - b. SHALL include the “SessionType” element with the value as:
    1. cv: if the ISC User’s request is for content viewing only;
    2. cv-cm: if the ISC User’s request is for content viewing and communication;
10. SHALL send the SIP INVITE request towards the ISC Server Media Function according to the rules and procedures of the SIP/IP Core;

11. If “SessionType” element value is “cv-cm” in MIME SDP body with Content-Type header ‘application/ISC-content-request+xml’ and the value of “ISCConvergenceID” is same as in other SIP INVITE.
  - a. Refer 1-1 Communication Session procedures as specified in [OMA-CPM-CONV-TS] section “7.3.1.2 Initiating a CPM Group Session for a CPM Ad-hoc Group” with the following clarifications. The CPM Client:
    - i. SHALL include an Accept-Contact header field with the ISC IARI Feature Tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.group-cv-cm’ percent encoded in a g.3gpp.icsi-ref media feature tag according to [3GPP TS 24.229] section 7.2A.9.2 “Coding of the IARI”;
    - ii. SHALL include the ISC IARI feature tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.group-cv-cm’ percent encoded as per [3GPP TS 24.229] section 7.2A.9.2 “Coding of the IARI” in a g.3gpp.icsi-ref media feature tag of the Contact header field;
    - iii. SHALL set CPM Conversation-ID header field to the value of ISCConvergenceID which is used for group content viewing as specified in the Appendix H “ISC-defined SIP Headers”;
    - iv. SHALL include a MIME body of the SIP INVITE request:
      1. SHALL set the Content-Type header field to “application/ISC-content-request+xml” including the reference to selected content in “ContentRef”;
    - v. SHALL include the “SessionType” element with the value as:
      1. cv: if the ISC User’s request is for content viewing only;
      2. cv-cm: if the ISC User’s request is for content viewing and communication;

Note: Upon receiving the SIP 200 “OK” the originating CPM Client will setup an MSRP channel to exchange messages between the pre-defined group members.

Upon receiving the SIP 200 “OK” response, the ISC Client SHALL establish a RTSP session according to the rules and procedures of [RFC2326]:

- a. Upon receiving the request from the ISC User to start receiving the content
  - iii. the ISC Client SHALL generate RTSP PLAY according to the rules and procedures of [RFC2326];
  - iv. SHALL receive the content from the ISC Server Media Function over the established RTSP session;
- b. Upon receiving the request from the ISC User to pause the content being watched, the ISC Client:
  - i. SHALL send a RTSP PAUSE request towards the ISC Server Media Function;
  - ii. SHALL temporarily stop receiving the media related to the content from the ISC Server Media Function over the established RTSP session;
- c. Upon receiving the request from the ISC User to resume the content paused, the ISC Client:
  - i. SHALL send a RTSP PLAY request towards the ISC Server Media Function;
  - ii. SHALL continue receiving the temporarily halted content from the position where it stopped, from the ISC Server Media Function over the established RTSP session;

Note: Upon receiving any other request from the ISC User allowed by [RFC2326], the ISC Client SHALL send the corresponding RTSP request towards the ISC Server Media Function, and subsequent actions SHALL be performed according to the rules and procedures of [RFC2326].

## 6.4.5 Group Communication (Originating Side)

Upon receiving the request from the ISC User to watch content and communicate with members of ISC pre-defined group, the ISC/CPM Client SHALL generate a SIP INVITE for communication request according to the rules and procedures of [RFC3261]. In particular, the CPM Client:

1. SHALL interact with the ISC Client to fetch the ISC pre-defined group members list and group policies from ISC XDMS according to procedures specified in [OMA-XDM-TS] and generate a URI list;

2. SHALL initiate a Group Communication Session as specified in [OMA-CPM-CONV-TS] section “7.3.1.2 Initiating a CPM Group Session for a CPM Ad-hoc Group” with the following clarifications:
  - a. SHALL include an Accept-Contact header field with the ISC IARI Feature Tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.group-cv-cm’ percent encoded in a g.3gpp.icsi-ref media feature tag according to [3GPP TS 24.229] section 7.2A.9.2 “Coding of the IARI”;
  - b. SHALL include the ISC IARI feature tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.group-cv-cm’ percent encoded as per [3GPP TS 24.229] section 7.2A.9.2 “Coding of the IARI” in a g.3gpp.icsi-ref media feature tag of the Contact header field;
  - c. If a new communication is started along with group content viewing, then the CPM Client SHALL set CPM Conversation-ID header field to the value of ISConvergenceID which is used for group content viewing as specified in the Appendix H “ISC-defined SIP Headers”;
  - d. SHALL include a MIME body of the SIP INVITE request with the following clarifications:
    - i. SHALL set the Content-Type header field to “application/ISC-content-request+xml” including the reference to selected content in “ContentRef”;
    - ii. SHALL include the “SessionType” element with the value as:
      1. cv: if the ISC User’s request is for content viewing only;
      2. cv-cm: if the ISC User’s request is for content viewing and communication;

Upon receiving the SIP 200 “OK” response for communication, the CPM Client SHALL establish a MSRP session with ISC Server Communication Function according to the rules and procedures of [RFC4975] for exchanging messages with the ISC Group members;

## 6.4.6 Change Content Viewing in a Pre-defined Group (Originating Side)

Note: See Flow in Appendix C.4.2 “Change Content Viewing”.

Upon receiving the request from the ISC User to change the content being watched, the ISC Client SHALL generate a SIP re-INVITE request according to section 6.4.1 “Content Viewing and Communication with a Pre-defined Group (Originating Side)” with the following additional clarifications:

1. SHALL include the ISConvergenceID header field of the existing ISC Content Viewing as specified in the Appendix H “ISC-defined SIP Headers”;
2. SHALL include the reference to new requested content in the “ContentRef” element of the “application/ISC-content-request+xml” MIME body;
3. SHALL send the SIP re-INVITE request towards the ISC Server Media Function according to the rules and procedures of the SIP/IP Core;

Upon receiving the SIP 200 “OK” response, the ISC Client SHALL modify the Media Plane according to the re-negotiated SDP for receiving the media related to the new content from the ISC Server Media Function;

## 6.4.7 Change Content Viewing in a Pre-defined Group (Terminating Side)

Note: See Flow in Appendix C.4.2 “Change Content Viewing”.

Upon receiving a SIP re-INVITE request for Change Content Viewing with the ISC IARI feature tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.group-cv-cm’ included in the Accept-Contact header field, the terminating ISC Client SHALL perform procedures according to section 6.4.2 “Content Viewing and Communication with a Pre-defined Group (Terminating Side)” with the following clarifications:

1. SHALL auto-accept and send the SIP 200 “OK” response according to rules and procedures of the SIP/IP core including the ISConvergenceID header field and value as received in the SIP INVITE request;
2. SHALL modify the Media Plane according to the re-negotiated SDP of the new content.

## 6.4.8 Content Viewing and Communication with a Adhoc Group (Originating Side)

Note: See Flow in Appendix C.5.1 “Establish a Content Viewing and Communication Session with an Ad-hoc Group”.

Upon receiving the request from the ISC User to watch content and communicate with members of ISC Ad-hoc group, the ISC Client SHALL generate a SIP INVITE for content viewing request according to the rules and procedures of [RFC3261]. In particular, the ISC Client:

1. SHALL set the Request-URI to the address of the ISC Server;
2. SHALL include an Accept-Contact header field with the ISC Feature Tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ and with ISC IARI Feature Tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.group-cv-cm’ 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 section 7.2A.9.2 “Coding of the IARI”;
3. SHALL include the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ 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 set the P-Preferred-Service header field with the value of the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’;
5. SHALL include the ISC User Address of the originating ISC Client that has been authenticated by the SIP/IP core as authenticated originator's ISC address;
6. SHALL include a User-Agent header field to indicate the OMA ISC release version of the ISC Client as specified in Appendix G “Release Version in User-agent and Server headers”;
7. If a new ISC Content Viewing is started, the ISC Client SHALL include a ISConvergenceID header field set to a newly generated value as specified in Appendix H “ISC-defined SIP Headers”; Otherwise include the ISConvergenceID of the existing ISC Content Viewing;

Note: If a new Content Viewing is started along with the existing ad-hoc Group Communication, then ISC Client SHALL interact with CPM Client to fetch CPM Conversation-ID and set ISConvergenceID header field to the value of CPM Conversation-ID which is used for existing ad-hoc Group Communication;

8. SHALL include 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.
9. SHALL include a MIME body of the SIP INVITE request with the following clarifications:
  - a. SHALL set the Content-Type header field to “application/ISC-content-request+xml” including the reference to selected content in “ContentRef”;
  - b. SHALL include the “SessionType” element with the value as:
    - i. cv: if the ISC User’s request is for content viewing only;
    - ii. cv-cm: if the ISC User’s request is for content viewing and communication;
  - c. SHALL include the URI list for creating the Ad-hoc Group;
  - d. If the originating user sets using another ISC/CPM Client to support communication, the MIME body SHALL include:
    - i. “UsingMultipleClient” element with the value “yes” (default value is “no”);
    - ii. “CommunicationClientAddr” element with the value as the client address of ISC/CPM Client to support the communication session;
10. SHALL send the SIP INVITE request towards the ISC Server Media Function according to the rules and procedures of the SIP/IP Core;
11. If the “SessionType” is “cv-cm” and the originating user does not set using another ISC/CPM Client to support communication, continue with Section 6.4.11 “Ad-hoc Group Communication (Originating Side)”.

Upon receiving the SIP 200 “OK” response, the ISC Client SHALL establish a RTP session according to the rules and procedures of [RFC3550] for receiving the media related to the requested content from the ISC Server Media Function.

## 6.4.9 Content Viewing and Communication with an Ad-hoc Group (Terminating Side)

Note: See Flow in Appendix C.5.1 “Establish a Content Viewing and Communication session with an Ad-hoc Group”.

Upon receiving a SIP INVITE request for Content Viewing with the ISC IARI feature tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.group-cv-cm’ included in the Accept-Contact header field, the terminating ISC Client:

1. SHALL check if the value of “ISCConvergenceID” and “SessionType” element value is “cv-cm” in MIME SDP body with Content-Type header ‘application/ISC-content-request+xml’. If yes then the ISC Client SHOULD wait until SIP INVITE request for Communication with the CPM feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session’ and for the same “ISCConvergenceID” is received before continuing with rest of the steps;
2. SHALL return:
  - a. a SIP 480 “Temporarily Unavailable” response if there are not enough resources to handle the ISC Session, or
  - b. a SIP 486 "Busy Here" response if the ISC User or ISC 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 408 “Timeout” response if the ISC User does not provide any input either until the value of the Expires header in the incoming SIP INVITE is reached (if present and time value is positive), or until a maximum time value set by the ISC Client is reached, whichever comes first.
  - d. a SIP 603 “Declined” response if the ISC User has rejected the invitation.

Otherwise, continue with the rest of steps;

3. SHALL send the SIP 200 “OK” response according to rules and procedures of the SIP/IP core, with the following clarifications:
  - a. The ISC Client SHALL process an incoming SDP and accept, modify or reject the Media Streams requested in the incoming SDP as defined by [RFC3264], [RFC3264] and [RFC3550] to include an answer SDP;
  - b. The ISC Client SHALL include the ISCConvergenceID header field and value as received in the SIP INVITE request;
4. After sending a SIP 200 OK response to the originating ISC Client, the ISC Client SHALL establish a RTP session according to the rules and procedures of [RFC3550] for receiving the media related to the content from the ISC Server Media Function;

Upon receiving a SIP INVITE request for Communication with the CPM feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session’ included in the Accept-Contact header field, the terminating CPM Client SHALL refer to Group Communication Session procedures as specified in [OMA-CPM-CONV-TS] section “7.3.2 Receiving a CPM Session Invitation”.

Note: The terminating CPM Client will setup an MSRP channel can be setup to exchange messages between the members of ISC ad-hoc group;

The CPM Client SHALL interact with the ISC Client to render the contents from Content Viewing and Communication Sessions together when the value of “ISCConvergenceID” is same.

## 6.4.10 Content Viewing and Communication with a Adhoc Group – Control Content (Originating Side)

Note: See Flow in Appendix C.5.1 “Establish a Content Viewing and Communication Session with an Ad-hoc Group”.

Upon receiving the request from the ISC User to watch content and communicate with members of ISC Ad-hoc group, the ISC Client SHALL generate a SIP INVITE for content viewing request according to the rules and procedures of [RFC3261]. In particular, the ISC Client:

1. SHALL set the Request-URI to the address of the ISC Server;
2. SHALL include an Accept-Contact header field with the ISC Feature Tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ and with ISC IARI Feature Tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.group-cv-cm’ 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 section 7.2A.9.2 “Coding of the IARI“;
3. SHALL include the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ 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 set the P-Preferred-Service header field with the value of the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’;
5. SHALL include the ISC User Address of the originating ISC Client that has been authenticated by the SIP/IP core as authenticated originator's ISC address;
6. SHALL include a User-Agent header field to indicate the OMA ISC release version of the ISC Client as specified in Appendix G “Release Version in User-agent and Server headers”;
7. If a new ISC Content Viewing is started, the ISC Client SHALL include a ISCConvergenceID header field set to a newly generated value as specified in Appendix H “ISC-defined SIP Headers”; Otherwise include the ISCConvergenceID of the existing ISC Content Viewing;

Note: If a new Content Viewing is started along with the existing ad-hoc Group Communication, then ISC Client SHALL interact with CPM Client to fetch CPM Conversation-ID and set ISCConvergenceID header field to the value of CPM Conversation-ID which is used for existing ad-hoc Group Communication;

8. SHALL include 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 with the following clarifications:
  - A. the m-line for setting up a RTSP session according to the rules and procedures of [RFC2326] and [RFC4567];
9. SHALL include a MIME body of the SIP INVITE request with the following clarifications:
  - B. SHALL set the Content-Type header field to “application/ISC-content-request+xml” including the reference to selected content in “ContentRef”;
  - C. SHALL include the “SessionType” element with the value as:
    1. cv: if the ISC User’s request is for content viewing only;
    2. cv-cm: if the ISC User’s request is for content viewing and communication;
  - D. SHALL include the URI list for creating the Ad-hoc Group;
10. SHALL send the SIP INVITE request towards the ISC Server Media Function according to the rules and procedures of the SIP/IP Core;
11. If “SessionType” element value is “cv-cm” in MIME SDP body with Content-Type header ‘application/ISC-content-request+xml’ and the value of “ISCConvergenceID” is same as in other SIP INVITE.
  - E. Refer Ad-hoc Communication Session procedures as specified in [OMA-CPM-CONV-TS] section “7.3.1.2 Initiating a CPM Group Session for a CPM Ad-hoc Group” with the following clarifications. The CPM Client:
    - i. SHALL include an Accept-Contact header field with the ISC IARI Feature Tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.group-cv-cm’ percent encoded in a g.3gpp.icsi-ref media feature tag according to [3GPP TS 24.229] section 7.2A.9.2 “Coding of the IARI“;
    - ii. SHALL include the ISC IARI feature tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.group-cv-cm’ percent encoded as per [3GPP TS 24.229] section 7.2A.9.2 “Coding of the IARI“ in a g.3gpp.icsi-ref media feature tag of the Contact header field;
    - iii. SHALL set CPM Conversation-ID header field to the value of ISCConvergenceID which is used for group content viewing as specified in the Appendix H “ISC-defined SIP Headers”;
    - iv. SHALL include a MIME body of the SIP INVITE request;



1. SHALL set the Content-Type header field to “application/ISC-content-request+xml” including the reference to selected content in “ContentRef”;
- v. SHALL include the “SessionType” element with the value as:
  1. cv: if the ISC User’s request is for content viewing only;
  2. cv-cm: if the ISC User’s request is for content viewing and communication;

Note: Upon receiving the SIP 200 “OK” the originating CPM Client will setup an MSRP channel to exchange messages between the originating and terminating CPM Client(s).

Upon receiving the SIP 200 “OK” response, the ISC Client SHALL establish a RTSP session according to the rules and procedures of [RFC2326]:

- a. Upon receiving the request from the ISC User to start receiving the content
  - i. the ISC Client SHALL generate RTSP PLAY according to the rules and procedures of [RFC2326];
  - ii. SHALL receive the content from the ISC Server Media Function over the established RTSP session;
- b. Upon receiving the request from the ISC User to pause the content being watched, the ISC Client:
  - i. SHALL send a RTSP PAUSE request towards the ISC Server Media Function;
  - ii. SHALL temporarily stop receiving the media related to the content from the ISC Server Media Function over the established RTSP session;
- c. Upon receiving the request from the ISC User to resume the content paused, the ISC Client:
  - i. SHALL send a RTSP PLAY request towards the ISC Server Media Function;
  - ii. SHALL continue receiving the temporarily halted content from the position where it stopped, from the ISC Server Media Function over the established RTSP session;

Note: Upon receiving any other request from the ISC User allowed by [RFC2326], the ISC Client SHALL send the corresponding RTSP request towards the ISC Server Media Function, and subsequent actions SHALL be performed according to the rules and procedures of [RFC2326].

## 6.4.11 Ad-hoc Group Communication (Originating Side)

Upon receiving the request from the ISC User to watch content and communicate with members of ISC Ad-hoc group, the ISC/CPM Client SHALL generate a SIP INVITE for communication request according to the rules and procedures of [RFC3261]. In particular, the CPM Client:

1. SHALL initiate a Ad-hoc Group Communication Session as specified in [OMA-CPM-CONV-TS] section “7.3.1.2 Initiating a CPM Group Session for a CPM Ad-hoc Group” with the following clarifications:
2. SHALL include an Accept-Contact header field with the ISC IARI Feature Tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.group-cv-cm’ percent encoded in a g.3gpp.icsi-ref media feature tag according to [3GPP TS 24.229] section 7.2A.9.2 “Coding of the IARI”;
3. SHALL include the ISC IARI feature tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.group-cv-cm’ percent encoded as per [3GPP TS 24.229] section 7.2A.9.2 “Coding of the IARI” in a g.3gpp.icsi-ref media feature tag of the Contact header field;
4. If a new communication is started along with Ad-hoc group content viewing, then the CPM Client SHALL set CPM Conversation-ID header field to the value of ISCConvergenceID which is used for Ad-hoc group content viewing as specified in the Appendix H “ISC-defined SIP Headers”;
5. SHALL include a MIME body of the SIP INVITE request with the following clarifications:
  - a. SHALL set the Content-Type header field to “application/ISC-content-request+xml” including the reference to selected content in “ContentRef”;
  - b. SHALL include the “SessionType” element with the value as:

1. cv: if the ISC User's request is for content viewing only;
2. cv-cm: if the ISC User's request is for content viewing and communication;

Upon receiving the SIP 200 "OK" response for communication, the CPM Client SHALL establish a MSRP session with ISC Server Communication Function according to the rules and procedures of [RFC4975] for exchanging messages with another ISC User;

### 6.4.12 Change Content Viewing in an Ad-hoc Group (Originating Side)

Note: See Flow in Appendix C.5.2 "Change Content Viewing".

Upon receiving the request from the ISC User to change the content being watched, the ISC Client SHALL generate a SIP re-INVITE request according to section 6.4.8 "Content Viewing and Communication with a Adhoc Group (Originating Side)" with the following additional clarifications:

1. SHALL include the ISConvergenceID header field of the existing ISC Content Viewing as specified in the Appendix H "ISC-defined SIP Headers";
2. SHALL include the reference to new requested content in the "ContentRef" element of the "application/ISC-content-request+xml" MIME body;
3. SHALL send the SIP re-INVITE request towards the ISC Server Media Function according to the rules and procedures of the SIP/IP Core;

Upon receiving the SIP 200 "OK" response, the ISC Client SHALL modify the Media Plane according to the re-negotiated SDP for receiving the media related to the new content from the ISC Server Media Function;

### 6.4.13 Change Content Viewing in an Ad-hoc Group (Terminating Side)

Note: See Flow in Appendix C.5.2 "Change Content Viewing".

Upon receiving a SIP re-INVITE request for Change Content Viewing in a Ad-hoc Group with the ISC IARI feature tag 'urn:urn-7:3gpp-service.ims.iari.oma.isc.group-cv-cm' included in the Accept-Contact header field, the terminating ISC Client SHALL perform procedures according to section 6.4.9 "Content Viewing and Communication with an Ad-hoc Group (Terminating Side)" with the following clarifications:

1. SHALL auto-accept and send the SIP 200 "OK" response according to rules and procedures of the SIP/IP core including the ISConvergenceID header field and value as received in the SIP INVITE request;
2. SHALL modify the Media Plane according to the re-negotiated SDP of the new content.

### 6.4.14 Searching Active Content Viewing Group according to Content View

Note: see the flows as listed in Appendix C.16.1 "Searching Content Viewing Group according to Content View".

Note: see the flows as listed in Appendix C.16.1 "Searching Content Viewing Group according to Content View".

Upon receiving a request from the ISC User to searching active Content Viewing Group, the ISC Client SHALL generate a HPPT POST request according to the rules and procedures of [OMA-XDM-TS\_Core] and [OMA-XDM-TS\_Group] and [OMA-TS-ISC-XDMS] with the additional clarifications described in this section. In particular, the ISC Client:

1. SHALL compose XQuery expression to contain the searching criteria as including:
  - a. Subscriber's identifier, which indicates who initiates the subscription;
  - b. Identifier of Content View, which indicates subscribing the information of the Content Viewing Group(s) as viewing the indicated Content View;
  - c. Name of Content View, which indicates subscribing the information of the Content Viewing Group(s) as viewing the Content View(s) with the name;

- d. Pre-defined keyword of Content View, which indicates subscribing the information of the Content Viewing Group(s) as viewing the Content View(s) with the pre-defined keyword;
  - e. Global searching flag, which is flag if searching all possible Content Viewing Group(s) or only searching the Content Viewing Group(s) the subscriber is being in or is invited to participated in;
2. SHALL send the HTTP POST towards the ISC Group Application Usages of ISC XDMS, via XDM Client, according to the rules and procedures of [OMA-XDM-TS\_Core] and [OMA-XDM-TS\_Group] and [OMA-TS-ISC-XDMS]

Upon receiving a HTTP 200 “OK” via XDM Client the ISC Client SHALL parse the searched result according to the rules and procedures of [OMA-XDM-TS\_Core] and [OMA-XDM-TS\_Group] and [OMA-TS-ISC-XDMS].

## 6.5 Associated Contents Viewing Session Handling

### 6.5.1 Initiating an Associated Contents Viewing Session

Upon receiving the request from the ISC User to view Associated Contents, the ISC Client SHALL generate a SIP INVITE or SIP re-INVITE request according to the rules and procedures of [RFC3261]. In particular, the ISC Client:

1. SHALL set the Request-URI to the ISC Server’s address as provisioned to the ISC Client;
2. SHALL include an Accept-Contact header field with ISC ICSI Feature Tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ and with the ISC IARI Feature Tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.acv-session’ to indicate the ISC Associated Contents Viewing 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 and section 7.2A.9.2 “Coding of the IARI“;
3. SHALL include the ISC feature tag ‘urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ 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 set the P-Preferred-Service header field with the value of the ISC Feature Tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’;
5. SHALL include the ISC User Address of the originating ISC Client that has been authenticated by the SIP/IP core as authenticated originator’s ISC address;
6. SHALL include a User-Agent header field to indicate the OMA ISC release version of the ISC Client as specified in Appendix G “Release Version in User-agent and Server headers”;
7. SHALL include a MIME body in the SIP INVITE body with the Content-Type header field of “application/ISC-content-request+xml” including:
  - a. the reference to the Primary Content in “ContentRef”, and
  - b. The ISConvergenceID of the ISC Content Viewing Session;
8. SHALL include a MIME SDP body as a SDP offer in the SIP INVITE or SIP re-INVITE request according to the rules and procedures of [RFC4566] and [RFC3264];
9. SHALL send the SIP INVITE or SIP re-INVITE request towards the ISC Server according to the rules and procedures of the SIP/IP core.

Upon receiving the SIP 200 “OK” response, the ISC Client SHALL establish a RTP session according to the rules and procedures of [RFC3550] for receiving the media related to the requested Associated Contents from the ISC Server.

## 6.6 Immersive Content Viewing Session Handling

### 6.6.1 Initiating Immersive Content Viewing sessions

#### 6.6.1.1 Initiating an Immersive Content Viewing session according to Content View selection

If device settings are set to enable Immersive Content Viewing sessions and allowed by the service provider policy, the ISC Client SHALL collect the ISC User's Content View selection in any one of the following cases:

- Content View identifier
- ISC User's field of view
- ISC User's viewing distance

To receive Content Views and Continuous Content Views based on the collected ISC User's Content View selection, the ISC Client SHALL generate an initial SIP INVITE request according to the rules and procedures of [RFC3261]. In this SIP INVITE request, the ISC Client:

1. SHALL set the Request-URI to the ISC Server's address as provisioned to the ISC Client;
2. SHALL include an Accept-Contact header field with ISC ICSI Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm' and with the ISC IARI Feature Tag 'urn:urn-7:3gpp-service.ims.iari.oma.isc.icv-session' to indicate the ISC Immersive Content Viewing 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 and section 7.2A.9.2 "Coding of the IARI";
3. SHALL set the P-Preferred-Service header field with the value of the ISC Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm';
4. SHALL include a Contact header field with the ISC Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm', 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 option tag 'timer' in the Supported header field;
6. SHOULD include the Session-Expires header with the refresher parameter set to "uas" according to the rules and procedures of [RFC4028];
7. SHALL include the ISC User Address of the ISC User as the authenticated originator's address;
8. SHALL include a User-Agent header field to indicate the OMA ISC release version of the ISC Client as specified in Appendix G "Release Version in User-agent and Server Headers (Normative)";
9. SHALL include a MIME resource-list body as specified in [RFC5366]. Each entry in the URI-list identifies a Content View selection and SHALL contain one or more of the following parameters:
  - a. "?isc\_icv=id", if the Content View selection identified by the URI is used as Content View identifier;
  - b. "?isc\_icv=fov", if the Content View selection identified by the URI is used as ISC User's field of view;
  - c. "?isc\_icv=vd", if the Content View selection identified by the URI is used as ISC User's viewing distance;
10. SHALL include a MIME SDP body as a SDP offer in the SIP INVITE request according to the rules and procedures of [RFC4566] and [RFC3264];
11. 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 ISC Client SHALL handle the response according to the rules and procedures of [RFC3261], with the following clarifications:

1. The ISC 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 ISC 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 ISC Client SHALL initiate the Media Plane according to the negotiated SDP.

Once the ISC Immersive Content Viewing Session is set up, the ISC Client SHALL receive and display the Content Views and Continuous Content Views to the ISC User.

### 6.6.1.2 Initiating an Immersive Content Viewing session according to Spatial Configuration

To receive Content Views and Continuous Content Views based on the ISC User selected Spatial Configuration, the ISC Client SHALL generate an initial SIP INVITE request according to the rules and procedures of [RFC3261]. In this SIP INVITE request, the ISC Client:

1. SHALL set the Request-URI to the Content Identifier(URI) selected by ISC User;
2. SHALL include an Accept-Contact header field with ISC ICSI Feature Tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ and with the ISC IARI Feature Tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.icv-session’ to indicate the ISC Immersive Content Viewing 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 and section 7.2A.9.2 “Coding of the IARI“;
3. SHALL set the P-Preferred-Service header field with the value of the ISC Feature Tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’;
4. SHALL include a Contact header field with the ISC Feature Tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ , 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 option tag ‘timer’ in the Supported header field;
6. SHOULD include the Session-Expires header with the refresher parameter set to "uas" according to the rules and procedures of [RFC4028];
7. SHALL include the ISC User Address of the ISC User as the authenticated originator's address;
8. SHALL include a User-Agent header field to indicate the OMA ISC release version of the ISC Client as specified in Appendix G “Release Version in User-agent and Server Headers (Normative)”;
9. SHALL include a MIME resource-list body with the target addresses of the ISC Clients as specified in [RFC5366], to set the ISC User selected Spatial Configuration. Each entry in the URI-list identifies a spatial-based mapping between Content Views and ISC User’s device and SHALL contain one or more of the following attributes:
  - a. “isc:spatialrelationship”, if the spatial relationship (e.g. left, right, etc.) is used as the Spatial Configuration;
  - b. “isc:location”, if the location (e.g. north, south, etc.) is used as the Spatial Configuration;
  - c. “isc:orientation”, if the orientation (e.g. towards the east, facing west, etc.) is used as the Spatial Configuration;
10. SHALL include a MIME SDP body as a SDP offer in the SIP INVITE request according to the rules and procedures of [RFC4566] and [RFC3264];
11. 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 ISC Client SHALL handle the response according to the rules and procedures of [RFC3261], with the following clarifications:

1. The ISC 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 ISC 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 ISC Client SHALL initiate the Media Plane according to the negotiated SDP.

Once the ISC Immersive Content Viewing Session is set up, the ISC Client SHALL get ready to receive the Content Views and Continuous Content Views distributed from ISC Server according to the selected Spatial Configuration.

## 6.6.2 Modifying Immersive Content Viewing sessions

### 6.6.2.1 Modifying an Immersive Content Viewing session according to Content View selection

To receive Content Views and Continuous Content Views based on the modified ISC User's Content View selection, the ISC Client SHALL generate an SIP re-INVITE request according to section 6.6.1.1 "Initiating an Immersive Content Viewing session according to Content View selection" with the following additional clarifications:

1. The ISC 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;
2. The ISC Client SHALL include a modified MIME resource-list body as specified in [RFC5366]. Each entry in the URI-list identifies a Content View selection and SHALL contain one or more of the following parameters:
  - a. "?isc\_icv=id", if the Content View selection identified by the URI is used as Content View identifier;
  - b. "?isc\_icv=fov", if the Content View selection identified by the URI is used as ISC User's field of view;
  - c. "?isc\_icv=vd", if the Content View selection identified by the URI is used as ISC User's viewing distance;
3. The ISC Client SHALL include a modified MIME SDP body as a new SDP offer in the SIP re-INVITE request according to the rules and procedures of [RFC4566] and [RFC3264];

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

1. The ISC Client SHALL generate and send a SIP ACK request according to the rules and procedures of [RFC3261] and the SIP/IP core;
2. The ISC Client SHALL modify the Media Plane according to the re-negotiated SDP.

### 6.6.2.2 Modifying an Immersive Content Viewing session according to Spatial Configuration

To receive Content Views and Continuous Content Views based on the ISC User modified Spatial Configuration, the ISC Client SHALL generate an SIP re-INVITE request according to section 6.6.1.2 "Initiating an Immersive Content Viewing session according to Spatial Configuration" with the following additional clarifications:

1. The ISC 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;
2. SHALL include a modified MIME resource-list body with the target addresses of the ISC Clients as specified in [RFC5366], to set the ISC User selected Spatial Configuration. Each entry in the URI-list identifies a spatial-based mapping between Content Views and ISC User's device and SHALL contain one or more of the following attributes:
  - a. "isc:spatialrelationship", if the spatial relationship (e.g. left, right, etc.) is used as the Spatial Configuration;
  - b. "isc:location", if the location (e.g. north, south, etc.) is used as the Spatial Configuration;
  - c. "isc:orientation", if the orientation (e.g. towards the east, facing west, etc.) is used as the Spatial Configuration;
3. The ISC Client SHALL include a modified MIME SDP body as a new SDP offer in the SIP re-INVITE request according to the rules and procedures of [RFC4566] and [RFC3264];

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

1. The ISC Client SHALL generate and send a SIP ACK request according to the rules and procedures of [RFC3261] and the SIP/IP core;
2. The ISC Client SHALL modify the Media Plane according to the re-negotiated SDP.

## 6.7 Receiving Contents List

Note: See Flows in Appendix C.8 “Receiving Full Contents List from CP” and Appendix C.9 “Receiving Personalized Contents List”.

Upon receiving the request from the ISC User to retrieve contents list, the ISC/XDM Client SHALL subscribe to the “xcap-diff” event package (if the SIP SUBSCRIBE request is targeted towards the ISC XDMS) in order to receive continuous updates about Contents List and generate a SIP SUBSCRIBE request according to the rules and procedures of [RFC6665] with the additional clarifications described in this section. In particular, the ISC/XDM Client:

1. SHALL set the Request-URI as described in [OMA-XDM-TS] to include the XUI address of the ISC User, if the SIP SUBSCRIBE request is targeted towards the ISC XDMS. Otherwise, SHALL set the Request-URI to the address of the ISC Server Contents Guide Function;
2. SHALL include an Accept-Contact header field with the ISC ICSI Feature Tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ 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 include the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ 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 ISC User Address of the originating ISC/XDM Client that has been authenticated by the SIP/IP core as authenticated originator’s ISC address;
5. SHALL include a User-Agent header field to indicate the OMA ISC release version of the ISC/XDM Client as specified in Appendix G “Release Version in User-agent and Server headers”;
6. SHALL set the P-Preferred-Service header field with the value of the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’;
7. SHALL set the Event header field to “xcap-diff”;
8. SHALL set the Expires header field to “0” for receiving the Contents List document one time, otherwise to a “non-zero” value according to the rules and procedures of [RFC6665];
9. SHALL include Accept header field with the following values:
  - a. “application/xcap-diff+xml” to receive continuous updates of Contents List document, according to the rules and procedures described in [RFC5875];
10. SHALL include Content-Type header field to “application/contents-list+xml”;
11. SHALL use filters user preferences and/or user’s context information in the MIME body of the SIP SUBSCRIBE request to filter out notifications based on changes done to either the entire Content List XML document, or only to On-Demand elements. Filters (user preferences and/or user’s context information) SHALL be set to one of the following:
  - a. “FullContentsList” as the type of Contents List retrieval in the field <RefName>, which is the sub-element of <UserChoice> for retrieving full Contents List; else
  - b. “ReferOnDemandPref” as the type of Contents List retrieval in the field <RefName>, which is the sub-element of <UserChoice> for retrieving personalized Contents List;
    - i. SHALL include the user preferences as filters (user-defined filter criterias according to the elements in contents-list structure, as specified in Appendix (C.17.1) by the ISC User; and/or
    - ii. SHALL include the user’s context information as filters (for e.g., user’s context information is viewing/viewed content).
12. SHALL send the SIP SUBSCRIBE request towards the ISC Server Contents Guide Function according to the rules and procedures of the SIP/IP Core.

Upon receiving a SIP 200 “OK”, the ISC/XDM Client has successfully sent the request to receive the Contents List, towards the ISC XDMS/ISC Server Contents Guide Function;

Upon receiving a subsequent SIP NOTIFY that includes Contents List from the ISC XDMS/ISC Server Contents Guide Function, the ISC/XDM Client:

1. SHALL return a SIP 200 “OK”;

2. SHALL provide the full Contents List or personalized Contents List to the ISC User according to the filter set in SIP SUBSCRIBE;

## 6.8 Delegation of a Content Usage Right

### 6.8.1 Delegating a Content Usage Right to other ISC Users (Originating Side)

Note: See flow in Appendix C.7 “Delegating a Content Usage Right to other ISC Users”.

When the ISC Client receives a request from the ISC User to delegate the right to use a content to one or more ISC Users, the ISC Client SHALL generate a SIP REFER request according to the rules and procedures of [RFC3515]. The ISC Client:

1. SHALL set the Request-URI to the address of the ISC Server’s provisioned to the ISC Client;
2. SHALL include an Accept-Contact header field with the ISC Feature Tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ 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 include the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ 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 set the P-Preferred-Service header field with the value of the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’;
5. SHALL include the ISC User Address of the originating ISC Client that has been authenticated by the SIP/IP core as authenticated originator’s ISC address;
6. SHALL include a User-Agent header field to indicate the OMA ISC release version of the ISC Client as specified in Appendix G “Release Version in User-agent and Server headers”;
7. SHALL include the option tag ‘timer’ in the Supported header field;
8. SHALL include the Session-Expires header with the refresher parameter set to “uac” according to the rules and procedures of [RFC4028];
9. If the delegation request is to be sent to one ISC User, the ISC Client SHALL:
  - a. set the address of the Refer-To header to the address of the target ISC User;
  - b. set the method header field value inside the Refer-To header to ‘INVITE’;
10. If the delegation request is to be sent to multiple ISC Users, the ISC Client SHALL include a MIME resource-lists+xml list in the body according to the rules and procedures of [RFC5368], with the following clarifications
  - a. Each resource entry SHALL include a uri header field set to the address of each target ISC User and the method value set to “INVITE”;
11. SHALL include a MIME body that includes information about the ISC Client’s authentication to use the content (content usage right), with the following clarifications:
  - a. The Content-Type header field SHALL be set to ‘application/vnd.oma.isc.authinfo’;
  - b. The Content-Transfer-Encoding header field SHALL be set to ‘binary’;
12. SHALL include a MIME body (e.g. with Content-Type set to ‘text/plain’) that includes information about the content for which the usage right is requested for delegation.
13. SHALL send the SIP REFER request towards the ISC Server according to the rules and procedures of the SIP/IP core.

Upon receiving the first SIP NOTIFY from the ISC Server, the ISC Client SHALL return a SIP 200 “OK” response to acknowledge its receipt.

Upon receiving a subsequent SIP NOTIFY from the ISC Server, the ISC Client:



1. SHALL return a SIP 200 “OK” response to acknowledge its receipt;
2. SHALL inform the sending ISC User about the status of the delegation request based on the received notification, including the status and reason(s) for failure as appropriate;
3. If the notification contains as a status line corresponding to a SIP 200 “OK” response, SHALL delete the content usage right information of the ISC User.

## 6.8.2 Handle Delegation of a Content Usage Right (Terminating Side)

Upon receiving a CPM File Transfer (SIP INVITE) request with the ISC IARI feature tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.social’ included in the Accept-Contact header field, the terminating ISC Client

1. SHALL check if the request contains a MIME body with Content-Type header set to ‘application/vnd.oma.isc.authinfo’, to check if this is a request to delegate a content usage right. If such a header field value cannot be found, the ISC Client SHALL proceed with the request as described in Section 6.3.2 “1-1 Content Viewing and Communication (Terminating Side)”;  
Otherwise, continue with the rest of the steps;
2. SHALL inform the receiving ISC User about the request and render relevant content, including the nature of the request (delegation request), the identity of the original sender of the request and any information about the content to be delegated;
3. SHALL offer the ISC User the possibility to provide an input to either accept or reject the request;
4. SHALL include a Server header field to indicate the OMA ISC release version of the ISC Client as specified in Appendix G “Release Version in User-agent and Server headers”;
5. SHALL generate a response based on the ISC User’s input or absence of input:
  - a. If the ISC User accepts the request, SHALL generate a SIP 200 “OK” response with an SDP answer containing the identities (name, size, type) of the delegation file to be transferred, as received in the incoming INVITE request;
  - b. If the ISC User rejects the request, SHALL generate a SIP 603 “Decline” response;
  - c. If the ISC User does not provide any input either until the value of the Expires header in the incoming SIP INVITE is reached (if present and time value is positive), or until a maximum time value set by the ISC Client is reached, whichever comes first, the ISC Client SHALL generate a SIP 408 “Timeout” response.
6. SHALL send the SIP response according to rules and procedures of the SIP/IP core;

If a SIP session was opened successfully and upon receiving an MSRP SEND request that contains the content usage right for the receiving ISC User, the terminating ISC Client:

1. SHALL receive and store the content usage right;
2. SHALL acknowledge the reception by returning a 200 “OK” response;

Upon receiving a SIP BYE request after a content usage right has been received, the terminating ISC Client SHALL return a SIP 200 “OK” response to acknowledge the request and close the SIP session.

Upon receiving a SIP CANCEL request to cancel a request to delegate a content usage right, the ISC Client:

1. SHALL return a SIP 200 “OK” response to acknowledge the request;
2. SHALL inform the receiving ISC User that the request for delegation of a content usage right has been cancelled.

## 6.9 Recommendation of a Content

Note: See flow in Appendix C.15 “Recommending a Content to another ISC User”.

## 6.9.1 Recommending a Content to Another ISC User (Originating Side)

When the ISC Client receives a request from the ISC User to recommend a content to another ISC User, the ISC Client SHALL generate a CPM Standalone Message (SIP MESSAGE) request according to [OMA-CPM-CONV-TS] (section 7.2.1.1, “Sending a Pager Mode CPM Standalone Message”) and the rules and procedures of [RFC3261], with the additional clarifications and differences described in this section. In particular, the ISC Client:

7. SHALL set the Request-URI to the address of the receiving ISC User;
8. SHALL include an Accept-Contact header field with the ISC IARI feature tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.social’ percent encoded in a g.3gpp.iari-ref media feature tag according to [3GPP TS 24.229] section 7.2A.9.2 “Coding of the IARI”;
9. SHALL set the P-Preferred-Service header field with the value of the ISC IARI feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.social’;
10. SHALL include the ISC User Address of the originating ISC Client that has been authenticated by the SIP/IP core as authenticated originator's ISC address;
11. SHALL include a User-Agent header field to indicate the OMA ISC release version of the ISC Client as specified in Appendix G “Release Version in User-agent and Server headers”;
12. SHALL include the ISC-Convergence-ID header field associated with the on-going ISC Content Viewing Group session;
13. SHALL include a MIME body that includes information about the recommended content and related information, with the following clarifications:
  - a. The top-level Content-Type header field SHALL be set to ‘application/vnd.oma.isc.recommendinfo’;
  - b. The body SHALL contain a sub-level MIME body with its Content-Type header field set to ‘text/xml’. This sub-level MIME body SHALL contain the following fields: ‘name’ (name of the content to recommend), ‘id’ (identifier of the content), ‘description’ (description about the content), ‘start\_time’ (time when the content starts), ‘end\_time’ (time when the content ends), ‘info\_url’ (address where more information about the content can be found), ‘user\_message’ (personal message that the recommending ISC User would like to convey), ‘expiry\_time’ (time until when the recommendation is valid);
  - c. The body SHOULD contain a sub-level MIME body that contains a preview image of the recommended content;
  - d. The body SHALL contain a sub-level MIME body with its Content-Type header field set to ‘text/xml’, that contains information about the ISC Content Viewing Group in which the recommended content can be watched. This sub-level MIME body SHALL contain the following fields: ‘name’ (name of the ISC Content Viewing Group), ‘description’ (description of the ISC Content Viewing Group), ‘address’ (address of the ISC Content Viewing Group);
14. SHALL send the SIP MESSAGE towards the ISC/CPM Server according to the rules and procedures of the SIP/IP Core.

Upon receiving a SIP 200 “OK” the ISC Client SHALL inform the sending ISC User that the recommendation message has been sent successfully towards the receiving ISC User;

Upon receiving a subsequent SIP NOTIFY that informs that another ISC User joined the established ISC Content Viewing Group to watch the recommended content, the ISC Client:

1. SHALL return a SIP 200 “OK” response to acknowledge its receipt;
2. SHALL inform the ISC User about the event.

## 6.9.2 Receiving Recommendation of a Content from Another ISC User (Terminating Side)

Upon receiving a SIP MESSAGE request with the ISC IARI feature tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.social’ included in the Accept-Contact header field, the terminating ISC Client:

1. SHALL check if the SIP MESSAGE request includes a MIME body with Content-Type header set to 'application/vnd.oma.isc.recommendinfo', to check if the message contains a recommendation of a content. If it does not contain such a header value, the ISC Client SHALL interact with the CPM Client to proceed with the request as a standard SIP MESSAGE.  
Otherwise, continue with the rest of the steps;
2. SHALL store the 'expiry\_time' and the 'address' field value that contains the address of the ISC Content Viewing Group associated with the recommended content;
3. SHALL inform the receiving ISC User about the recommendation information;
4. SHALL generate a SIP 200 "OK" response according to the rules and procedures of [RFC3428] towards the originating ISC Client along the SIP signalling path;
5. SHALL include a Server header field to indicate the OMA ISC release version of the ISC Client as specified in Appendix G "Release Version in User-agent and Server headers";
6. MAY include the registered ISC address of the ISC User as authenticated recipient 's ISC address;
7. SHALL include the ISC-Convergence-ID header field received in the SIP MESSAGE request;
8. SHALL send the SIP response according to rules and procedures of the SIP/IP core;

Upon receiving a request from the receiving ISC User to participate in the specified ISC Content Viewing Group to watch the recommended content, the ISC Client:

1. SHALL check if the request time has passed the stored 'expiry\_time' value received in the recommendation information. If so, the ISC Client SHALL inform the ISC User that the deadline to participate to the ISC Content Viewing Group and watch the recommended content has passed;  
Otherwise, continue with the rest of the steps;
2. SHALL follow the steps mentioned in Section 6.4.1 "Content Viewing and Communication with a Pre-defined Group (Originating Side)" using the stored 'address' value of the ISC Content Viewing Group received in the recommendation information.

## 6.10 Content Interest management

### 6.10.1 Content Interest – User Express Interest (Originating Side)

Note: See Flow in Appendix C.12.1 "Content Interest – User Express Interest".

Upon receiving the request from the ISC User to express the interest to view content along with other ISC Users, the ISC Client SHALL generate a SIP MESSAGE request according to the rules and procedures of [RFC3428] with the additional clarifications described in this section. In particular, the ISC Client:

1. SHALL set the Request-URI to the address of the ISC Server, if the interest has to be expressed to more than one terminating ISC Users; Otherwise the Request-URI will include the address of the terminating ISC User;
2. SHALL include an Accept-Contact header field with the ISC ICSI Feature Tag 'urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm' and with ISC IARI feature tag 'urn:urn-7:3gpp-service.ims.iari.oma.isc.contentinterest' 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 section 7.2A.9.2 "Coding of IARI";
3. SHALL set the P-Preferred-Service header field with the value of the ISC feature tag 'urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm';
4. SHALL include the ISC User Address of the originating ISC Client that has been authenticated by the SIP/IP core as authenticated originator's ISC address;
5. SHALL include a User-Agent header field to indicate the OMA ISC release version of the ISC Client as specified in Appendix G "Release Version in User-agent and Server headers";
6. SHALL include the URI list of the ISC Users to whom the content interest is expressed;
7. SHALL include the ISConvergenceID header field as specified in the Appendix H "ISC-specific SIP Headers";

8. SHALL set the Content-Type header field to “application/vnd.oma.isc.content-interest+xml”;
9. SHALL include the following in the SIP MESSAGE body as a MIME content for the interested content:
  - a. “ContentRef” – unique identity of content
  - b. “ContentName” – name of the Content
  - c. “Description” – description of the content
  - d. “UserMessage” – message to the other ISC users
  - e. “UserSetExpiryTime” – time within which the other ISC Users response is expected
10. SHALL store locally on the device the ISCConvergenceID until the UserSetExpiryTime elapses;
11. SHALL send the SIP MESSAGE towards the ISC Server according to the rules and procedures of the SIP/IP Core;

Upon receiving the SIP MESSAGE with the ISC IARI feature tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.contentinterest’, the ISC Client:

1. SHALL check if the ISCConvergenceID header field matches the locally stored ISCConvergenceID. If yes continue with rest of the steps;
2. SHALL extract the “UserID” element(s) and the corresponding “UserInterest” element from the body containing the Content-Type “application/vnd.oma.isc.content-interest+xml”;
3. SHALL notify the ISC User about the content interest response from other ISC Users according to the value extracted from the sub-element “UserInterest” of “UserID”;
4. SHALL send a SIP 200 “OK” in response towards the ISC Server.

## 6.10.2 Content Interest – User Express Interest (Terminating Side)

Note: See Flow in Appendix C.12.1 “Content Interest – User Express Interest”.

Upon receiving a SIP MESSAGE request with the ISC IARI feature tag “urn:urn-7:3gpp-service.ims.iari.oma.isc.contentinterest” included in the Accept-Contact header field, the terminating ISC Client:

1. SHALL check if the SIP MESSAGE request includes a MIME body with Content-Type header set to ‘application/vnd.oma.isc.content-interest+xml’.
2. SHALL check if the ISCConvergenceID header field matches any locally stored ISCConvergenceID. If yes, the terminating ISC Client SHALL ignore the SIP MESSAGE. Otherwise, continue with the rest of the steps;
3. SHALL inform the terminating ISC User about the content interest expressed by the originating ISC User;
4. SHALL send the SIP 200 “OK” response according to rules and procedures of the SIP/IP core;

Upon receiving the terminating ISC User response (either “yes” or “no”) to the originating ISC User expressed content interest, the terminating ISC Client SHALL generate a SIP MESSAGE according to the rules and procedures of [RFC3428] with the following clarifications. The terminating ISC Client:

1. SHALL check if the ‘UserSetExpiryTime’ has lapsed. If yes then notify the terminating ISC User about the expired time. Otherwise, continue with the rest of the steps;
2. SHALL set the Request-URI to the address of the Originating ISC User;
3. SHALL include an Accept-Contact header field with the ISC ICSI Feature Tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’ and with ISC IARI feature tag ‘urn:urn-7:3gpp-service.ims.iari.oma.isc.contentinterest’ 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 section 7.2A.9.2 “Coding of IARI”;
4. SHALL set the P-Preferred-Service header field with the value of the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm’;

5. SHALL include the ISC User Address of the originating ISC Client that has been authenticated by the SIP/IP core as authenticated originator's ISC address;
6. SHALL include a User-Agent header field to indicate the OMA ISC release version of the ISC Client as specified in Appendix G "Release Version in User-agent and Server headers";
7. SHALL set the ISConvergenceID header field as received in the SIP MESSAGE request from the originating ISC User expressing content interest;
8. SHALL set the Content-Type header field to "application/vnd.oma.isc.content-interest+xml";
9. SHALL include the following in the SIP MESSAGE body as a MIME content for the interested content:
  - a. SHALL set the value of "UserInterest" to "yes" or "no" according to the response of the terminating ISC User;
10. SHALL send the SIP MESSAGE request towards ISC Server.

If the 'UserSetExpiryTime' has lapsed and the terminating ISC User has not responded until then, the terminating ISC Client SHOULD notify the terminating ISC User about the expired time.

### 6.10.3 Content Interest – Announcing Group Creation (Originating Side)

Note: See Flow in Appendix C.12.2 "Content Interest – Announcing Group Creation".

Upon receiving a Group XDMS generated Extended Group Advertisement message (SIP MESSAGE) request including the ISC ICSI feature tag 'urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm' in one of the Accept-Contact header fields and contains a MIME Content-Type "application/vnd.oma.isc.newgroupannouncement+xml", the originating ISC Client:

1. SHALL check the ISC User Address of the originating ISC Client has been authenticated by the SIP/IP core is an authenticated originator's ISC address;
2. SHALL extract the "GroupID" of the announced pre-defined group from the MIME body of the Group XDMS generated Extended Group Advertisement message (SIP MESSAGE) request and notify the terminating ISC User;
3. SHALL send the SIP 200 "OK" response according to rules and procedures of the SIP/IP core;

### 6.10.4 Content Interest – Announcing Group Creation (Terminating Side)

Note: See Flow in Appendix C.12.2 "Content Interest – Announcing Group Creation".

Upon receiving a Group XDMS generated Extended Group Advertisement message (SIP MESSAGE) request with the ISC ICSI feature tag 'urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm' included in one of the Accept-Contact header fields and containing a MIME Content-Type "application/vnd.oma.isc.newgroupannouncement+xml", the terminating ISC Client:

1. SHALL check the ISC User Address of the originating ISC Client has been authenticated by the SIP/IP core is an authenticated originator's ISC address;
2. SHALL extract the "GroupID" of the announced pre-defined group from the MIME body of the Group XDMS generated Extended Group Advertisement message (SIP MESSAGE) request and notify the terminating ISC User;
3. SHALL send the SIP 200 "OK" response according to rules and procedures of the SIP/IP core;

### 6.10.5 Content Interest – receive alert notification before content delivery (Originating Side)

Note: See Flow in Appendix C.12.3 "Content Interest – receive alert notification before content delivery".

Upon receiving the request from the ISC User to set the time for later delivery of content and for receiving alert notification prior to the content delivery, the ISC Client SHALL generate a SIP PUBLISH request with presence event package as described in [OMA-PRS-TS]. In addition, the ISC Client:

1. SHALL include the ISC User Address of the originating ISC Client that has been authenticated by the SIP/IP core as authenticated originator's ISC address;
2. SHALL set the Content-Type header field to "application/vnd.oma.isc.content-alert+xml";
3. SHALL include the following in the SIP PUBLISH body as a MIME content for setting the later delivery of content and setting the time for receiving alert following procedures described in [OMA-DDS-Presence\_Data\_Ext-V2\_2-20111101-A\_0090R01] section 7.23 "Content-delivery Information":
  - a. "ContentRef" – the reference to the content;
  - b. "StartTime" – to the time decided to watch content;
  - c. "ReminderTime" – to the time for receiving alert notification prior to content delivery;
4. SHALL send the SIP PUBLISH request towards the Presence Server according to the rules and procedures of the SIP/IP Core;

Upon receiving the SIP MESSAGE request with the ISC IARI feature tag "urn:urn-7:3gpp-service.ims.iari.oma.isc.contentinterest" included in the Accept-Contact header field and the content type is "application/vnd.oma.isc.content-alert+xml" included in the Content-Type header field , the ISC Client:

1. SHALL extract and check for ISCCongvergenceID match with locally stored ISCCongvergenceID to identify the alert message sent from ISC Server is the response for the expressed interested Content.
2. SHALL extract the alert information from the MIME body and notify the ISC User;
3. SHALL send a SIP 200 "OK" in response;

### 6.10.6 Content Interest – receive alert notification before content delivery (Terminating Side)

Note: See Flow in Appendix C.12.3 "Content Interest – receive alert notification before content delivery".

Upon receiving a SIP NOTIFY request identified through the "service identification" element as described in the [OMA-DDS-Presence\_Data\_Ext-V2\_2-20111101-A\_0090R01], the terminating ISC Client:

1. SHALL check the ISC User Address of the originating ISC Client has been authenticated by the SIP/IP core is an authenticated originator's ISC address;
2. SHALL extract the below elements from the SIP NOTIFY body for displaying to the ISC User:
  - i. "ContentRef" – the reference to the content;
  - ii. StartTime – time for later delivery of content;
  - iii. ReminderTime – time at which the alert is sent to ISC Users;
3. SHALL send the SIP 200 "OK" response according to rules and procedures of the SIP/IP core;

Upon receiving the SIP MESSAGE request with the ISC IARI feature tag "urn:urn-7:3gpp-service.ims.iari.oma.isc.contentinterest" included in the Accept-Contact header field and the content type is "application/vnd.oma.isc.content-alert+xml" included in the Content-Type header field , the ISC Client:

1. SHALL extract and check for ISCCongvergenceID match with locally stored ISCCongvergenceID to identify the alert message sent from ISC Server is the response for the expressed interested Content.
2. SHALL extract the alert information from the MIME body and notify the ISC User;
3. SHALL send a SIP 200 "OK" in response;

## 6.11 Interaction management

### 6.11.1 User expression

Note: See flow in Appendix C.18 “User Interaction”.

Upon receiving a SIP MESSAGE request from the ISC Server that contains a MIME Content-Type ‘application/vnd.oma.isc.userinteraction’, to support social interaction between the ISC User and the Content Provider, the ISC Client:

1. SHALL send the SIP 200 “OK” response according to rules and procedures of the SIP/IP core;
2. SHALL generate a SIP MESSAGE request according to the rules and procedures of [RCS3428], with the following clarifications;
  - a. SHALL set the Request-URI to the address of the ISC CPGateway,
  - b. SHALL include an Accept-Contact header field with the ISC Feature Tag ‘urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.isc.social’ 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 the ISC feature tag ‘urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.isc.social’ 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. SHALL set the P-Preferred-Service header field with the value of the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.social’;
  - e. SHALL include the ISC User Address of the originating ISC Client that has been authenticated by the SIP/IP core as authenticated originator’s ISC address;
  - f. SHALL include a User-Agent header field to indicate the OMA ISC release version of the ISC Client as specified in Appendix G “Release Version in User-agent and Server headers”;
  - g. SHALL include the ISCConvergenceID header field as specified in the Appendix H “ISC-specific SIP Headers”;
3. SHALL include a MIME body that includes information about the user expression as described in Appendix J. “User Interaction MIME”. SHALL send the SIP MESSAGE towards the ISC Server according to the rules and procedures of the SIP/IP Core.
4. SHALL receive 202 “Accepted” SIP response code according to [RFC 3428] from ISC Server;

Upon receiving a SIP MESSAGE request from the ISC Server that contains a MIME Content-Type ‘application/vnd.oma.isc.userinteraction’, to deliver the user expression status report for social interaction between the ISC User and the Content Provider, the ISC Client:

1. SHALL send the SIP 200 “OK” response according to rules and procedures of the SIP/IP core;

## 6.12 Multi-device Capability Management and Discovery

### 6.12.1 Publishing Device Capability Information

The ISC Client acts as a Presence Source which publishes its device capability information as Presence Information to the Presence Server (ISC Server) when it starts or its device capability information is changed. The publication progresses conform to the rules and procedures as described in the section “5.1.2 Publication of Presence Information using SIP” in [OMA-TS-Presence].

When the ISC Client publishes its device capability information as described in section “5.4.1.1 Device Capability Information”, it SHOULD contain the device’s unique ID and the ISC Client’s identifier.

## 6.12.2 Subscribing Devices Capability Information

Upon receiving an ISC User's subscription request for device capability information of an indicated device, the ISC Client acts as a Watcher to subscribe and receive relevant Presence Information from the ISC Server, according to the rules and procedures as described in section "5.2 Watcher" of [OMA-TS-Presence] and according to the ISC User's preferences.

The ISC Client's subscription for device capability information is based on device ID. It is out of scope how the ISC Client gets the target's device ID.

## 6.13 Device Presence Information Management and Discovery

### 6.13.1 Publishing Device Presence Information to the ISC Server

The ISC Client acts as a Presence Source which publishes its Device Presence Information as Presence Information to the Presence Server (ISC Server) when it starts or its Device Presence Information is changed. The publication progresses conform to the rules and procedures as described in the section "5.1.2 Publication of Presence Information using SIP" in [OMA-TS-Presence].

When the ISC Client publishes its Device Presence Information as described in section "5.4.2.1 Device Presence Information", it SHOULD contain the device's unique ID and the ISC Client's identifier.

### 6.13.2 Handling the Device Presence Information Subscription

Upon receiving an ISC User's subscription request for Device Presence Information of an indicated device, the ISC Client acts as a Watcher to subscribe and receive relevant Presence Information from the ISC Server, according to the rules and procedures as described in section "5.2 Watcher" of [OMA-TS-Presence] and according to the ISC User's preferences.

The ISC Client's subscription for Device Presence Information is based on device ID. It is out of scope how the ISC Client gets the target's device ID.

## 6.14 Multiple Devices Task Management

### 6.14.1 Resuming a Stopped Content Viewing with any of the ISC User's devices

The procedure for publishing Device Presence Information about the stopped and suspended Content Viewing to the ISC Server is same as the procedure which described in section 6.13.1 "Uploading Device Presence Information to the ISC Server".

The procedure for subscribing Device Presence Information about the stopped and suspended Content Viewing from the ISC Server is same as the procedure which described in section 6.13.2 "Handling to the Device Presence Information subscription".

### 6.14.2 Handling Notification to Establish Communication Session (Originating Side)

Note: See the flow listed in Appendix C.14.1 "Content Viewing and Communication session when the initiator uses multiple devices".

Upon receiving the SIP MESSAGE) request for establishing communication session from the ISC Server with the ISC IARI feature tag "urn:urn-7:3gpp-service.ims.iari.oma.isc.cm.recommendation" included in the Accept-Contact header field, the ISC/CPM Client:

1. SHALL check if the SIP MESSAGE request includes a MIME body with Content-Type header set to 'application/vnd.oma.isc.cm.recommendation', to check if the message contains a recommendation of communication;



2. SHALL parse the recommendation information for the communication in the MIME body, the information SHALL accord the rules described in section 6.3.3 “1-1 Communication (Originating Side)”;
3. SHOULD require the ISC User’s permission to establish the communication session;

Upon receiving the ISC User’s permission, SHALL establish the communication session with the target ISC User with the rules and procedures described in section 6.3.3 “1-1 Communication (Originating Side)”.

### 6.14.3 Handling Notification to Cancel Content Viewing Session (Terminating Side)

Note: See the flow listed in Appendix C.14.2 “Content Viewing and Communication session when the recipient using multi-devices”.

Upon receiving the SIP CANCEL request from the ISC Server for cancel a previous SIP INVITE request about establishing content viewing session with the ISC IARI feature tag “urn:urn-7:3gpp-service.ims.iari.oma.isc.cv.cancellation” included in the Accept-Contact header field, the ISC Client SHALL act as a UAS to handle the SIP CANCEL request according to the rules and procedures of [RFC3261], and

1. SHALL check whether the SIP CANCEL request includes a MIME body. If there is not MIME body or the Content-Type header value is not ‘application/vnd.oma.isc.cv.cancellation’, the ISC Client SHALL return a SIP 406 “Not Acceptable” and SHALL include a Warning header with the warning text set to “406 Not Acceptable” in the response according to the rules and procedures of [RFC3261];

Otherwise, continue with rest of the steps;

2. SHALL check whether the “CVInviteIdentifier” and “CancellationID” elements in the MIME body are available. If the two elements do not exist or their values are unavailable, the ISC Client SHALL return a SIP 406 “Not Acceptable” and SHALL include a Warning header with the warning text set to “406 Not Acceptable” in the response according to the rules and procedures of [RFC3261];

Otherwise, continue with rest of the steps;

3. SHALL search the related SIP INVITE request(s) according to the value of the “CVInviteIdentifier” element. If not found, the ISC Client SHALL return a SIP 404 “NOT FOUND” and SHALL include a Warning header with the warning text set to “404 Not Found” in the response according to the rules and procedures of [RFC3261];

Otherwise, continue with rest of the steps;

4. SHALL check the status(es) of the related SIP INVITE request(s). If the related SIP INVITE request(s) are processed, the ISC Client SHALL return a SIP 406 “Not Acceptable” and SHALL include a Warning header with the warning text set to “406 Not Acceptable” in the response according to the rules and procedures of [RFC3261];

Otherwise, continue with rest of the steps;

5. SHALL ignore the related SIP INVITE request(s) and respond a SIP 487 “Request Terminated” for the SIP INVITE request(s);

6. MAY notify the ISC User the cancellation information.

### 6.14.4 Handling Notification to Cancel Communication Session (Terminating Side)

Note: See the flow listed in Appendix C.14.2 “Content Viewing and Communication session when the recipient using multi-devices”.

Upon receiving the SIP CANCEL request from the ISC Server for cancel a previous SIP INVITE about establishing communication session with the ISC IARI feature tag “urn:urn-7:3gpp-service.ims.iari.oma.isc.cm.cancellation” included in the Accept-Contact header field, the ISC/CPM Client SHALL act as a UAS to handle the SIP CANCEL request according to the rules and procedures of [RFC3261], and with the rules and procedures as described in [CPM-CONV-TS].

## 6.15 Social Relationship

Note: See flow in Appendix C.19 “SET THE SOCIAL RELATIONSHIP”.

Upon receiving a SIP NOTIFY request from the ISC XDMS that contains the contacts group and social relationship for each contact based upon the ISC User’s subscription status, the ISC Client SHALL accept the creation of contacts group and the social relationship based on the ISC User’s request.

The ISC Client SHALL be notified of the social relationship update to ISC User from the terminating ISC XDMS based upon the ISC User’s subscription status.

## 6.16 Social Activity

Note: See flow in Appendix C.20 “SHARE THE SOCIAL ACTIVITY”.

The ISC Client SHALL be notified of the contents update based upon the ISC Client’s subscription to the content update in the ISC Server.

## 6.17 ISC User Preferences Management

The ISC Client SHALL format the requests for ISC User Preferences document management as described in the [XDM Core] sub-clause 6.1.1 “Document Management” with the following clarifications:

- It SHALL populate the AUID of the XCAP URI with “org.openmobilealliance.isc-user-prefs” Application Usage for ISC User preferences as defined in [ISC XDMS].

## 6.18 Resuming Previous Content Viewing

ISC User is watching a content via a ISC Client, when the ISC Client receives a SIP INVITE request for Content Viewing with the ISC feature tag ‘urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.isc.group-cv-cm’ included in the Accept-Contact header field, the ISC Client:

1. SHALL check if the value of “ISConvergenceID” and “SessionType” element value is “cv-cm” in MIME SDP body with Content-Type header ‘application/ISC-content-request+xml’. If yes then the ISC Client SHOULD wait until SIP INVITE request for Communication with the feature tag ‘urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.cpm.session’ and for the same “ISConvergenceID” is received before continuing with rest of the steps;
2. SHALL return:
  - a. a SIP 480 “Temporarily Unavailable” response if there are not enough resources to handle the ISC Session, or
  - b. a SIP 486 “Busy Here” response if the ISC User or ISC 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 408 “Timeout” response if the ISC User does not provide any input either until the value of the Expires header in the incoming SIP INVITE is reached (if present and time value is positive), or until a maximum time value set by the ISC Client is reached, whichever comes first.
  - d. a SIP 603 “Declined” response if the ISC User has rejected the invitation.

Otherwise, continue with the rest of steps;

3. SHALL inform the receiving ISC User about the request for Content Viewing;
4. upon receiving the request from the ISC User to pause the content which is been watching, SHALL check whether the content is been watching is available for pause, if the content is been watching is available for pause, SHALL send RTSP PAUSE to the ISC Server Media Function to pause the content which is been watching and store the Pause Time of the content which is been watching.

Otherwise, continue with rest of the steps;

5. SHALL send the SIP 200 “OK” response according to rules and procedures of the SIP/IP core, with the following clarifications:
  - a. The ISC Client SHALL process an incoming SDP and accept, modify or reject the Media Streams requested in the incoming SDP as defined by [RFC3264], [RFC3264] and [RFC3550] to include an answer SDP;
  - b. The ISC Client SHALL include the ISCConvergenceID header field and value as received in the SIP INVITE request;
6. After sending a SIP 200 OK response to the originating ISC Client, the ISC Client SHALL establish a RTP session according to the rules and procedures of [RFC3550] for receiving the media related to the content from the ISC Server Media Function;

When the content viewing for the group is stop or the ISC Client has left the group, the ISC Client SHALL send RTSP PLAY with the stored Pause Time to continue receiving previous content from the stored Pause Time towards the ISC Server Media Function, upon receiving a request from the ISC User to resume the paused content.

## 7. ISC XDMS

### 7.1 ISC User Preference Application Usage

In ISC Enabler, an ISC User/ISC Server manages authorizations rules (e.g. white/black lists, access control lists) and ISC User Preference by interacting with ISC User Preference Application Usage.

The ISC User Preferences Application Usage supports these functions to manage authorizations rules and ISC User Preference.

- Document Management .The procedure for Document Management shall conform to the sub-clause 6.1 “Document Management” in [OMA TS XDM Core].
  - The ISC Client SHALL format the request for ISC User Preference document management as described with the following clarifications:
    - It SHALL populate the AUID of the XCAP URI with “org.openmobilealliance.isc-user-prefs” Application Usage for ISC User Preferences.
- Subscription and Notification of ISC User preference Document change. The procedure for Subscription and Notification of ISC User preference Document change shall conform to the sub- clause sub-clause 6.1.2 “Subscribing to changes in the XDM Resource” in [OMA TS XDM Core ]
- Access Permissions. If the Access Permissions Document is used, the procedure to manage the Access Permissions Document at ISC Client/ISC Server SHALL conform to the sub-clause 6.1.1 “Document Management” and the sub-clause 5.6 “Access Permissions Document” in [OMA TS XDM Core] with the clarifications provided in this sub-clause.

### 7.2 ISC Contents List Application Usage

In ISC Enabler, an ISC User or ISC Server manages to retrieve ISC Contents List document by interacting with ISC Contents List Application Usage.

The ISC Contents List Application Usage supports these functions to manage authorizations rules and in retrieving the ISC Contents List document.

- Document Management .The procedure for Document Management shall conform to the sub-clause 6.1 “Document Management” in [OMA TS XDM Core].
  - The ISC Server Contents Guide Function SHALL format the request for the full Contents List document management from the XDMS (ISC XDMS) as described with the following clarification:
    - It SHALL populate the AUID of the XCAP URI with “org.openmobilealliance.isc.contentslist” Application usage for retrieval of ISC Contents List.
- Subscription and Notification of ISC Contents List Document change. The procedure for Subscription and Notification of ISC Contents List Document change shall conform to the sub- clause sub-clause 6.1.2 “Subscribing to changes in the XDM Resource” in [OMA TS XDM Core ]
- Access Permissions. If the Access Permissions Document is used, the procedure to manage the Access Permissions Document at ISC Client/ISC Server SHALL conform to the sub-clause 6.1.1 “Document Management” and the sub-clause 5.6 “Access Permissions Document” in [OMA TS XDM Core] with the clarifications provided in this sub-clause.

### 7.3 ISC Group XDM Application Usage

The ISC Group Application Usage manages the information about the Content Viewing Group in ISC XDMS. The ISC Group Application Usage is described in [OMA-TS-ISC-XDMS].

### 7.3.1 Searching Active Content Viewing Group according to Content View

Note: see the flows as listed in Appendix C.16.1 “Searching active Content Viewing Group according to Content View”.

Upon receiving a HTTP POST request for searching Content Viewing Group from an ISC Client via XDM Client, the ISC XDMS (ISC Group Application Usage) SHALL authenticate the request. When the ISC XDMS accepts the request, it parses the XQuery expression contained in the request, and searches the related document, and sends HTTP 200 “OK” response containing the searched results the ISC Client via XDM Client, according to the rules and procedures as defined in [OMA-XDM-TS\_Core] and [OMA-XDM-TS\_Group] and [OMA-TS-ISC-XDMS].

## 7.4 Group Management

### 7.4.1 Group Creation

Upon receiving a request from ISC User to create a pre-defined group, ISC Client SHALL send XCAP PUT request including URI list of ISC Users who will be members of pre-defined group and group policies, to ISC XDMS via XDM Client [see C.12.2 “Content Interest – announcing group creation”].

Upon receiving the authorized request from ISC Client to create a pre-defined group, the ISC XDMS SHALL create a pre-defined Content Viewing Group according to the XCAP PUT request which contains the group information (including group name, group description, group policies, and ISC Users list), and according to the rules and procedures as defined in [OMA-XDM-TS\_Core] and [OMA-XDM-TS\_Group] and [OMA-TS-ISC-XDMS]. The ISC Users list SHOULD be stored in the <list-service/invite-members> element of the Group Document in the ISC XDMS. When the pre-defined group is created, the ISC XDMS SHALL respond a HTTP 200 “OK” to ISC Client via XDM Client. The response contains information to describe the created pre-defined group.

### 7.4.2 Group Updates

When a content viewing and communication session associated with a pre-defined group [see 5.10 “Group Content Viewing and Communication session”] is changed (e.g. established, content changed, session closed, participant changed), the ISC Server Media Function SHALL send requests to the ISC XDMS to update the pre-defined group, according to the rules and procedures as defined in [OMA-XDM-TS\_Core] and [OMA-XDM-TS\_Group] and [OMA-TS-ISC-XDMS], including:

- Group participants information, as stored in <list-service/list> element of the Group Document in the ISC XDMS;
- Group active status, as stored in <list-service/active> element of the Group Document in the ISC XDMS;
- Content viewing session related information, as stored in <list-service/session> element of the Group Document in the ISC XDMS;
- Content related information, as stored in <list-service/content> element of Group Document in the ISC XDMS;

## 8. ISC CPGateway

### 8.1 User Interaction

Note: See flow in Appendix C.18 “User Interaction”.

Upon receiving the user interaction request from the Content Provider to support social interaction between the ISC User and the Content Provider, the ISC CPGateway SHALL generate a SIP MESSAGE request according to the rule and procedures of [RFC3428]. The ISC CPGateway;

1. SHALL set the Request-URI to the address of the ISC Server’s provisioned to the ISC CPGateway;
2. SHALL include an Accept-Contact header field with the ISC Feature Tag ‘urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.isc.social’ 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 include the ISC feature tag ‘urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.isc.social’ 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 set the P-Preferred-Service header field with the value of the ISC feature tag ‘urn:urn-7:3gpp-service.ims.icsi.oma.isc.social’;
5. SHALL include the ISC CPGateway Address that has been authenticated by the SIP/IP core as authenticated originator’s ISC address;
6. SHALL include a User-Agent header field to indicate the OMA ISC release version of the ISC Client as specified in Appendix G “Release Version in User-agent and Server headers”;
7. SHALL include the ISC-Convergence-ID header field associated with the on-going ISC Content Viewing Group session;
8. SHALL include a MIME body that includes information about the user expression with the following clarifications:
  - a. The top-level Content-Type header field SHALL be set to ‘application/vnd.oma.isc.userinteraction’;
  - b. The body SHALL contain a sub-level MIME body with its Content-Type header field set to ‘text/xml’. This sub-level MIME body SHALL contain the following fields: ‘user-expression’ (name of the user interaction), ‘id’ (identifier of the user expression), ‘description’ (description about the user expression), ‘items’ (set of item for the user expression), ‘item’ (item of the user expression), ‘id’ (identifier of item), ‘url’ (url of item), ‘participation’ (way for participation of user expression), ‘comm-addr’ (communication address of the user expression), ‘expired-time’ (expiry time of the user expression);
  - c. The MIME body SHALL be contained as described in Appendix J “User Interaction MIME”;
  - d. The body SHOULD contain a sub-level MIME body that contains a preview image of the user expression;
9. SHALL send the SIP MESSAGE towards the ISC Server according to the rules and procedures of the SIP/IP Core.
10. SHALL receive a SIP 200 “OK” response.

Upon receiving a SIP MESSAGE request from the ISC Server that contains a MIME Content-Type ‘application/vnd.oma.isc.userinteraction’, todeliver user expression between the ISC User and the Content Provider, the ISC CPGateway:

1. SHALL send 202 “Accepted” SIP response code according to [RFC 3428] to ISC Server;
2. SHALL aggregate the user expressions and generate the status of user interactions which include a MIME body that includes information about the th status of aggregated user expressions with the following clarifications:
  - a. The top-level Content-Type header field SHALL be set to ‘application/vnd.oma.isc.userinteractionreport’;
  - b. The body SHALL contain a sub-level MIME body with its Content-Type header field set to ‘text/xml’. This sub-level MIME body SHALL contain the following fields: ‘user-expression-report’ (name of the user expression report), ‘id’ (identifier of the user expression report), ‘description’ (description about the user

- expression report), 'status' (status of the user expression report), 'participation-num' (number of the user expression participation), 'items' (set of item for the user expression report), 'item' (item of the user expression report), 'id' (identifier of item), 'url' (url of item), 'count' (number of the user expression count), 'counted-time' (time of the user expression count);
- c. The body SHOULD contain a sub-level MIME body that contains a preview image of the user expression;
  - d. The body SHALL contain a sub-level MIME body with its Content-Type header field set to 'text/xml', that contains information about the ISC Content Viewing Group in which the user expression can be exchanged. This sub-level MIME body SHALL contain the following fields: 'name' (name of the ISC Content Viewing Group), 'description' (description of the ISC Content Viewing Group), 'address' (address of the ISC Content Viewing Group);
3. SHALL send the status of user interaction to the content provider
  4. SHALL generate the SIP MESSAGE including the above MIME body about the status of aggregated user expression with the following clarifications
    - a. SHALL set the Request-URI to the address of the ISC Server's provisioned to the ISC CPGateway;
    - b. SHALL include an Accept-Contact header field with the ISC Feature Tag 'urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.isc.social' 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 the ISC feature tag 'urn:urn-7:3gpp-service.ims.urn:urn-7:3gpp-service.ims.icsi.oma.isc.social' 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. SHALL set the P-Preferred-Service header field with the value of the ISC feature tag 'urn:urn-7:3gpp-service.ims.icsi.oma.isc.social';
    - e. SHALL include the ISC CPGateway Address that has been authenticated by the SIP/IP core as authenticated originator's ISC address;
    - f. SHALL include a User-Agent header field to indicate the OMA ISC release version of the ISC Client as specified in Appendix G "Release Version in User-agent and Server headers";
    - g. SHALL include the ISC-Convergence-ID header field associated with the on-going ISC Content Viewing Group session;
  5. SHALL receive a SIP 200 "OK" response from the ISC Server.

## 9. System Concepts

### 9.1 General Concepts

#### 9.1.1 Identification

##### ISC Client Address

An ISC Client is uniquely identified by a Unique User Agent Identifier.

A Unique User Agent Identifier distinguishes the ISC Client on a Device from other ISC Clients on other Devices used by the same ISC User.

The Unique ISC Agent Identifier SHALL be in the format of:

UUID URN as specified in [RFC4122].

The SIP/IP core assigns, during registration, a unique globally routable user agent URI to the device hosting the ISC Client and returns this GRUU in the registration response as specified in [RFC5627]. The GRUU allows the ISC Enabler to uniquely address each ISC Client residing on a different device.

##### ISC User Address

An ISC User is identified by his/her ISC User Address

An ISC User Address can be used for authentication, authorization, and charging, etc

An ISC User Address SHALL be in the format of:

- a SIP URI as specified in [RFC3261]; or
- a TEL URI as specified in [RFC3966].

#### 9.1.2 Signalling over the SIP/IP Core

##### 9.1.2.1 Registration and Authentication

On receiving the SIP registration request from an ISC Client, the SIP/IP core, according to [RFC3261]:

- Authenticates the ISC User; and,
- Binds an ISC User address and one or more Unique User Agent Identifiers ;and,
- Returns the complete list of bindings of that ISC User address in the response to the registration, if successful; and,
- Returns both a public GRUU and a temporary GRUU associated with the device of the ISC Client according to [RFC5627];and
- Keeps the binding information (e.g. ISC User address, Unique User Agent Identifier, expiration time, ISC Client capabilities, temporary GRUU ) until de-registration is performed for each Unique User Agent Identifier bound to the ISC User address

When the SIP/IP core corresponds with 3GPP/3GPP2 IMS then it is possible that the SIP/IP core informs the ISC Client about additional implicitly registered ISC User addresses in the SIP registration response.

The SIP/IP core provides an SIP authentication framework as defined in [RFC3261] to authenticate the ISC User. When the SIP/IP core corresponds with 3GPP/3GPP2, then the ISC Client SHALL consider ISC variants[3GPP TS33.178] and determine the appropriate authentication scheme according to [3GPP TS33.203]/[3GPP2 S.R0086-0] and [3GPP TS33.178].



### 9.1.2.2 Originator Address

The ISC Client MAY include the address of the sending ISC User when sending ISC requests and ISC responses.

The ISC Enabler expects that the SIP/IP core serving the ISC Client provides an authenticated address of the ISC User in ISC request and response.

## 9.2 Security

The Security mechanism provides protection to the ISC Enabler environment.

### General

The ISC Enabler Service environment SHOULD rely on /reuse security features/mechanisms provided by the underlying SIP/IP Core, to e.g. secure environment and authenticate users. Such dependence will be assumed as the basis for the security architecture .The SIP/IP Core is assumed to provide to user authentication and (optionally) confidentiality protection of SIP signalling as defined in [3GPP TS 33.203].When the SIP/IP core correspond to 3GPP/3GPP2 IMS, and the User Equipment contains USIM/ISIM or UIM/R-UIM mutual authentication between the ISC User and the SIP/IP Core SHALL be applied as specified in [3GPP TS 33.203]/[3GPP2 S.R0086-0]. All ISC Users SHALL be securely authenticated to allow reliable access control to ISC services.

### Secured Client Registration and ISC Service Usage Authentication

The SIP security measures applied to client registration and service usage authentication as described in section 9.1.2

“Signalling over the SIP/IP Core” also apply to the ISC Client registration and authentication of the service used by the ISC User according to [RFC3261].

### Originator Address

The ISC Client MAY include the address of the sending ISC User when sending ISC requests and ISC responses.

The ISC Enabler expects that the SIP/IP core serving the ISC Client provides an authenticated address of the ISC User in ISC request and response.

### Authentication between ISC Server and ISC Clients

Mutual authentication between ISC Server and ISC Client is expected on the interface ISC-1 as a prerequisite to authorization when the ISC Client requests to access services provided by the ISC Server or the ISC Server requests to access content /information stored on the ISC Client.

In some scenes, after mutual authentication, the key shared between ISC Server and ISC Client will be obtained and used for confidentiality and integrity for data transportation.

ISC Server shall authenticate ISC Client based on the following mechanisms

- checking the Principal’s address
- using–shared key authentication mechanisms
- Authentic user information provided by underlying trusted net work ;
  - the authentic user information (e.g. ,subscriber identifier ,keys negotiated between the user and network after net work access authentication )as credentials
- checking user name and password
- A mixture of the above of the above methods

A ISC Client authenticates an ISC Server based on the following mechanisms

- checking the ISC Server's certificate
  - When the ISC Server authenticates itself towards the ISC Client using certificate based TLS authentication, the ISC Client shall support certificated based on a Public Key Infrastructure (PKI) for which the ISC Client is pre-configured with a root or intermediate CA certificate in the signing chain of the certificate.
- Using pre-shared key authentication mechanisms.
- authentic information provided by underlying trusted net work
- A mixture of the above methods

As for the two authentication mechanisms described above, TLS in [OMA SEC\_CF-V1\_1] should be used when sending request using password authentication or authentic user information authentication.

## Mutual Authentication between ISC Server and Content Provider

Mutual authentication between ISC Server and Content Provider, which is expected on interfaces ISC -2 and ISC -3, is subject to service provider policy. The possible mechanisms are available in [OMA SEC\_CF-V1\_1].

## Content Storage Security

On receiving a request from a ISC Client to access communication-related content, different type of contents including the viewing/views contents, user generated contents(live/non-live),and Associated Contents stored in the ISC Server in the network, TLS/PSK-TLS can be used according to [RFC2246], [RFC4279], [OMA-SEC\_CF-AD], [3GPP TS33.210] and [RFC3501] as following, if requested by the ISC User and allowed by service provider policies.

- An ISC Server authenticates an ISC Client by checking the Principal's address/or by using pre-shared key authentication mechanisms or by using username and password.
- An ISC Client authenticates an ISC Server by checking the ISC Server's certificate or by using pre-shared key authentication mechanisms.

If integrity and confidentiality of the message/content are requested by the Principal and subject to service provider policies, the message /content are encrypted with integrity protection before transporting them between an ISC Client and an ISC Server.

In addition to the use of TLS/PSK-TLS, the ISC Server checks against the access control list if a Principal has the right to access the resources stored in the ISC Server.

## Confidentiality and Integrity Protection

The security mechanism SHALL be provided by the SIP/IP Core to support integrity and confidentiality protection of SIP Signalling.

When the SIP/IP Core Corresponds with 3GPP IMS or 3GPP2 MMD networks, the integrity and confidentiality protection mechanism are specified in [3GPP-TS\_33.203]/ [3GPP2-S.R0086].

## Data Confidentiality and Integrity between ISC Client and ISC Server

After mutual authentication between ISC Server and ISC Client, shared keys will be used for:

- Confidentiality and integrity for Users information /interaction transportation, possible mechanisms are available in [OMA SEC\_CF-V1\_1]
- Confidentiality for content transportation over protocols (e.g. HTTP, RTP), possible mechanisms are available in [OMA

SEC\_CF-V1\_1] or in [RFC 3711]

If integrity and confidentiality of communication data and content viewing data are requested by the ISC User and this is allowed by the service provider policies. TLS/PSK-TLS or SRTP will be performed during communication and content viewing process in accordance with [RFC2246], [RFC4279], [OMA-SEC-CF-V1\_1], [RFC3711] and [3GPP TS 33.203]/ [3GPP2 S.R0086-0].

## Appendix A. Change History

(Informative)

### A.1 Approved Version History

Reference	Date	Description
OMA-TS-ISC-V1_0-20150630-A	30 Jun 2015	Status changed to Approved by TP TP Ref # OMA-TP-2015-0116-INP_ISC_V1_0_ERP_for_final_Approval

## Appendix B. Static Conformance Requirements (Normative)

The notation used in this appendix is specified in [SCRRULES].

### B.1 SCR for ISC Client

Item	Function	Reference	Requirement
ISC-C-xx1-M	Delegating a Content Usage Right to other ISC Users (Originating Side)	Section 6.8.1	
ISC-C-xx2-M	Handle Delegation of a Content Usage Right (Terminating Side)	Section 6.8.2	ISC-C-xx1-M
ISC-C-xx3-M	Recommending a Content to Another ISC User (Originating Side)	Section 6.9.1	
ISC-C-xx4-M	Receiving Recommendation of a Content from Another ISC User (Terminating Side)	Section 6.9.2	ISC-C-xx3-M
ISC-C-xx5-M	Self Content Viewing	Section 6.2.1	
ISC-C-xx6-M	Self Change Content Viewing	Section 6.2.2	
ISC-C-xx7-M	Self Content Viewing with User Controls	Section 6.2.3	
ISC-C-xx8-M	1-1 Content Viewing and Communication (Originating Side)	Section 6.3.1	
ISC-C-xx9-M	1-1 Content Viewing and Communication (Terminating Side)	Section 6.3.2	
ISC-C-xx10-M	1-1 Communication (Originating Side)	Section 6.3.3	
ISC-C-xx11-M	1-1 Change Content Viewing (Originating Side)	Section 6.3.4	
ISC-C-xx12-M	1-1 Change Content Viewing (Terminating Side)	Section 6.3.5	
ISC-C-xx13-M	1-1 Control Content Viewing and Communication (Originating Side)	Section 6.3.6	
ISC-C-xx14-M	1-1 Control Content Viewing (Terminating Side)	Section 6.3.7	
ISC-C-xx15-M	Content Viewing and Communication with a Pre-defined Group (Originating Side)	Section 6.4.1	
ISC-C-xx16-M	Content Viewing and Communication with a	Section 6.4.2	

Item	Function	Reference	Requirement
	Pre-defined Group (Terminating Side)		
ISC-C-xx17-M	Content Viewing and Communication with a Pre-defined / Adhoc Group (Terminating Side)	Section 6.4.3	
ISC-C-xx18-M	Content Viewing and Communication with a Pre-defined Group – Control Content (Originating Side)	Section 6.4.4	
ISC-C-xx19-M	Group Communication (Originating Side)	Section 6.4.5	
ISC-C-xx20-M	Change Content Viewing in a Pre-defined Group (Originating Side)	Section 6.4.6	
ISC-C-xx21-M	Change Content Viewing in a Pre-defined Group (Terminating Side)	Section 6.4.7	
ISC-C-xx22-M	Content Viewing and Communication with a Adhoc Group (Originating Side)	Section 6.4.8	
ISC-C-xx23-M	Content Viewing and Communication with an Ad-hoc Group (Terminating Side)	Section 6.4.9	
ISC-C-xx24-M	Content Viewing and Communication with a Adhoc Group – Control Content (Originating Side)	Section 6.4.10	
ISC-C-xx25-M	Ad-hoc Group Communication (Originating Side)	Section 6.4.11	
ISC-C-xx26-M	Change Content Viewing in a Ad-hoc Group (Originating Side)	Section 6.4.12	
ISC-C-xx27-M	Change Content Viewing in a Ad-hoc Group (Terminating Side)	Section 6.4.13	
ISC-C-xx28-M	Receiving Contents List	Section 6.7	
ISC-C-xx29-M	Content Interest – User Express Interest (Originating Side)	Section 6.10.1	
ISC-C-xx30-M	Content Interest – User Express Interest (Terminating Side)	Section 6.10.2	
ISC-C-xx31-M	Content Interest – Announcing Group Creation (Originating Side)	Section 6.10.3	

Item	Function	Reference	Requirement
ISC-C-xx32-M	Content Interest – Announcing Group Creation (Terminating Side)	Section 6.10.4	
ISC-C-xx33-M	Content Interest – receive alert notification before content delivery (Originating Side)	Section 6.10.5	
ISC-C-xx34-M	Content Interest – receive alert notification before content delivery (Terminating Side)	Section 6.10.6	
ISC-C-001-M	Registering to SIP/IP Core	6.11 9.11 C.1	
ISC-C-002-O	Updating device capability information to SIP/IP Core	6.11 9.11	
ISC-C-003-M	Publishing its Device Presence Information	6.13	
ISC-C-004-M	Subscribing other devices' Device Presence Information	6.13	
ISC-C-005-M	Receiving and processing other devices' Device Presence Information	6.13	
ISC-C-006-M	Suspending or stopping a content viewing and uploading related information for future resuming	6.14 17	
ISC-C-007-M	Resuming a suspended/stopped content viewing	6.14 17	
ISC-C-008-M	Searching pre-defined Content Viewing Group	6.5 C.16.1	
ISC-C-009-O	Searching ad-hoc Content Viewing Group	6.5 C.16.1	
ISC-C-010-M	Initializing 1-1 content viewing session and communication session on separate devices	6.3 6.15 C.14.1	
ISC-C-011-M	Initializing 1-N content viewing session and communication session on separate devices	6.3 6.15 C.14.1	
ISC-C-012-M	Accepting invite for 1-1 content viewing session and communication session with separate devices	6.3 6.15 C.14.1	

Item	Function	Reference	Requirement
ISC-C-013-M	Accepting invite for 1-N content viewing session and communication session with separate devices	6.3 6.15 C.14.1	
ISC-C-014-O	Subscribing other devices' device capability information	6.12	
ISC-C-015-O	Receiving and processing other devices' device capability information	6.12	
ISC-C-xx1-M	Associated Contents Viewing Session Handling	Section 6.5 Section 0	
ISC-C-xx2-M	Initiating Immersive Content Viewing sessions	Section 6.6.1 Section C.10	
ISC-C-xx3-M	Modifying Immersive Content Viewing sessions	Section 6.6.2 Section C.10	
ISC-C-xx4-M	Pause the content which is been watching	Section x.y	
ISC-C-xx5-M	Store the Pause Time of the content which is been watching	Section x.y	ISC-C-xx4-M
ISC-C-xx6-M	Resume the paused content from the stored Pause Time	Section x.y	ISC-C-xx4-M ISC-C-xx5-M

## B.2 SCR for ISC Server

Item	Function	Reference	Requirement
ISC-S-xx1-M	Handle Delegation of a Content Usage Right	Section 5.6.1	
ISC-S-xx2-M	Handle Recommendation of a Content to another ISC User	Section 5.6.2	
ISC-S-xx3-M	Handle Contents List request	Section 5.1.1.1	
ISC-S-xx4-M	Handle Content Interest – User Express Interest	Section 5.1.2.1	
ISC-S-xx5-M	Handle Content Interest – Announcing Group Creation	Section 5.1.2.2	
ISC-S-xx6-M	Handle Content Interest – receive alert notification before content delivery	Section 5.6.3	
ISC-S-xx6-M	Handle Content Viewing and Change Content to self	Section 5.5.3.1	



Item	Function	Reference	Requirement
ISC-S-xx7-M	Handle Content to self with User Controls	Section 5.5.3.2	
ISC-S-xx8-M	Handle 1-1 Content Viewing session and Control Content	Section 5.5.4.1	
ISC-S-xx9-M	Handle 1-1 Communication session	Section 5.5.4.2	
ISC-S-xx10-M	Handle 1-1 Change Content Viewing session	Section 5.5.4.3	
ISC-S-xx11-M	Handle Content Viewing session with a Pre-defined Group	Section 5.5.5.1	
ISC-S-xx12-M	Handle Group Communication session	Section 5.5.5.2	
ISC-S-xx13-M	Handle Change Content Viewing with a pre-defined group	Section 5.5.5.3	
ISC-S-xx14-M	Handle Content Viewing session with an Ad-hoc Group	Section 5.5.5.4	
ISC-S-xx15-M	Handle Group Communication session	Section 5.5.5.5	
ISC-S-xx16-M	Handle Change Content Viewing with an Ad-hoc group	Section 5.5.5.6	
ISC-S-001-M	Authenticating the ISC Client	5.9 9.11 C.1	
ISC-S-002-M	Subscribing client registration event notification from the SIP/IP Core	5.9 9.11 C.1	
ISC-S-003-M	Receiving and processing the client registration event notifications from the SIP/IP Core	5.9 9.11 C.1	
ISC-S-004-M	Managing the Device Presence Information published by ISC Client	5.4.2	
ISC-S-005-M	Checking the subscription for Device Presence Information and sending related notifications to the subscriber	5.4.2	
ISC-S-006-M	Managing the content viewing related information for future resuming uploaded by the ISC Client	5.4.3 17	
ISC-S-007-M	Delivering the content	5.4.3	

Item	Function	Reference	Requirement
	viewing related information for future resuming to ISC Client	17	
ISC-S-008-M	Checking the searching request for pre-defined Content Viewing Group and sending the searching result to the subscriber	5.6.3 C.16.1	
ISC-S-009-O	Checking the searching request for ad-hoc Content Viewing Group and sending the searching result to the subscriber	5.6.3 C.16.1	
ISC-S-010-M	Upon establishing 1-1 content viewing session and communication session as originating side, notifying dedicated CPM Client of a same user to initializing communication session when the initiator wants multiple devices to support the sessions	5.11 5.4.3 C.14.1	
ISC-S-011-M	Upon establishing 1-N content viewing session and communication session as originating side, notifying dedicated CPM Client of a same user to initializing communication session when the initiator wants multiple devices to support the sessions	5.12 5.4.3 C.14.1	
ISC-S-012-M	Upon establishing 1-1 content viewing session and communication session as terminating side, notifying dedicated ISC Client(s) to cancel the content viewing session request(s) when the recipient wants multiple devices to support the sessions	5.11 5.4.3 C.14.1	
ISC-S-013-M	Upon establishing 1-N content viewing session and communication session as terminating side, notifying dedicated ISC Client(s) to cancel the content viewing	5.12 5.4.3 C.14.1	

Item	Function	Reference	Requirement
	session request(s) when the recipient wants multiple devices to support the sessions		
ISC-S-014-O	Checking the subscription for device capability information and sending related notifications to the subscriber	5.4.1 C.15.4	
ISC-S-xx1-M	Associated Contents Viewing Session Handling	Section 5.5.2 Section 0	
ISC-S-xx2-M	Handle an Immersive Content Viewing Session Invitation Request	Section 5.5.1.1 Section C.10	
ISC-S-xx3-M	Handle an Immersive Content Viewing Session Modification Request	Section 5.5.2.1 Section C.10	
ISC-S-xx4-M	Stop transmitting the media of the content over the UDP/RTP channel for the ISC Client	Section x.y	
ISC-S-xx5-M	Start transmitting the media of the content over the UDP/RTP channel for the ISC Client from the Pause Time	Section x.y	ISC-S-004-M

### B.3 SCR for ISC CP Gateway

Item	Function	Reference	Requirement

### B.4 SCR for ISC XDMS

Item	Function	Reference	Requirement

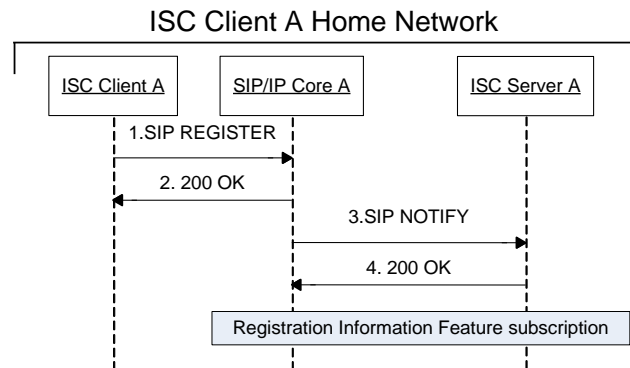
## Appendix C. Flows

(Normative)

### C.1 Registration

#### C.1.1 ISC Client Registration

This section describes the case where an ISC Client registers to the SIP/IP Core, and the SIP/IP Core notify the ISC Server the Registration Event Information about the registered ISC Client.



**Figure 1: ISC Client registration**

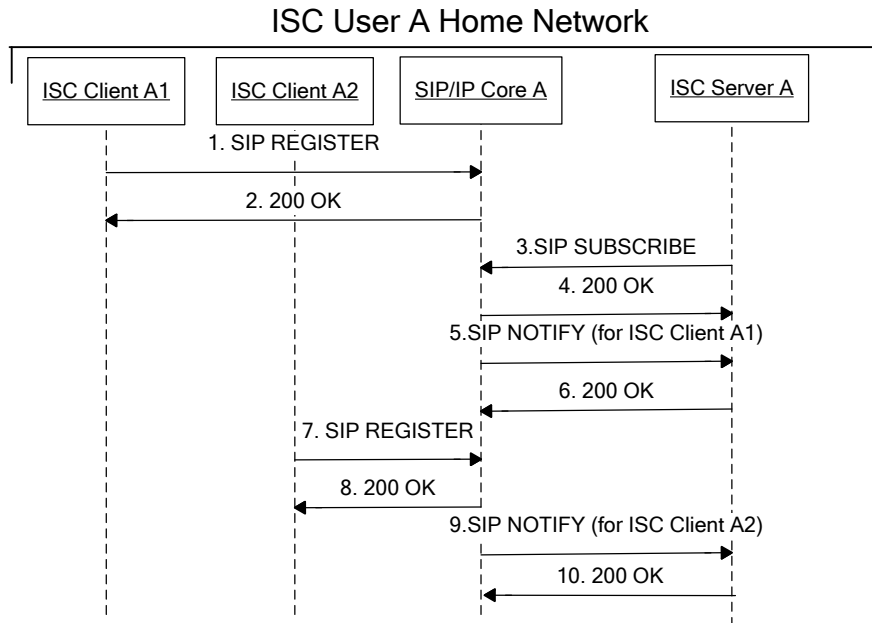
1. ISC Client A sends a registration request to SIP/IP Core A with a SIP REGISTER command.
2. SIP/IP Core A registers ISC Client A and informs ISC Client A about the result by sending a SIP 200 “OK” response.
3. SIP/IP Core A notifies ISC Server A about the registration of ISC Client A with a SIP NOTIFY command.
4. ISC Server A confirms the delivery of the registration information by sending a SIP 200 “OK” response.

Note: At any time, the ISC Server A can subscribe Registration Event Information from the SIP/IP Core A [see section C.1.2 “Registration Event Information Flows”].

## C.1.2 Registration Event Information Flows

### C.1.2.1 ISC Server Subscribing to Registration Event Information

This section describes the case where an ISC Server gets a list of ISC Clients used by the same ISC User with a possibility to later get notifications of the changes of the registered ISC Clients used by the same ISC User.



**Figure 2: ISC Server subscribes to the Registration Event Information**

1. ISC Client A1 registers to SIP/IP Core A with a SIP REGISTER command.
2. SIP/IP Core A registers ISC Client A1 and responds with an SIP 200 “OK” response.

**NOTE:** Steps 1 and 2 above are shown to illustrate the scenario of one ISC Client of ISC User A (ISC Client A1) already being registered. When the ISC Server A subscribes the Registration Event Information, the SIP/IP Core A will send the Registration Event Information about ISC Client A1 to the ISC Server.

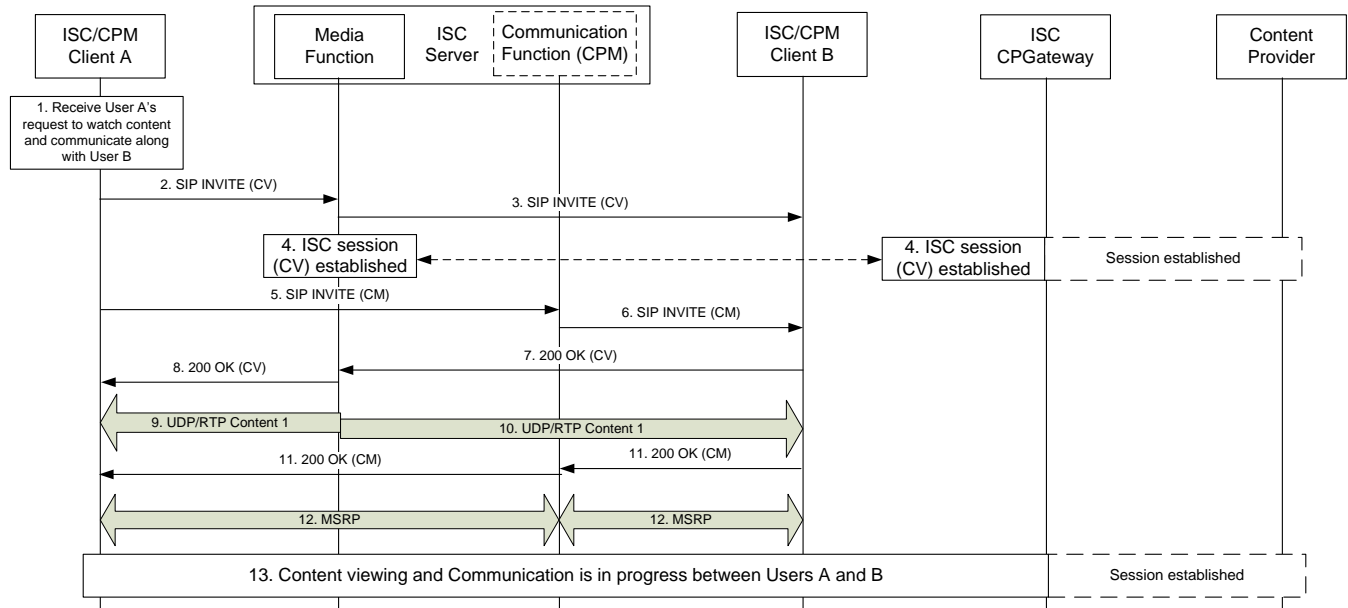
3. ISC Server A sends a Registration Event Information subscription request for ISC User A to SIP/IP Core A, with a SIP SUBSCRIBE command.
4. SIP/IP Core A authorizes the Registration Event Information subscription request and if successfully authorized, SIP/IP Core A responds with an SIP 200 “OK” response.
5. SIP/IP Core A sends a Registration Event Information notification to ISC Server A by a SIP NOTIFY command, informing ISC Server A about the currently registered clients of ISC User A (in this case only ISC Client A1).
6. ISC Server A confirms delivery of the Registration Event Information notification by sending a SIP 200 “OK” response.
7. Sometime later, ISC Client A2 registers to SIP/IP Core A with a SIP REGISTER command.
8. SIP/IP Core A registers ISC Client A2 and responds with a SIP 200 “OK” response.
9. SIP/IP Core A sends a Registration Event Information notification to ISC Server A by a SIP NOTIFY command, informing the ISC Server A that ISC Client A2 has registered.

10. ISC Server A confirms delivery of the Registration Event Information notification by sending a SIP 200 “OK” response.

## C.2 1-1 Content Viewing and Communication

### C.2.1 1-1 Content Viewing and Communication session

This section describes the case where an ISC User requests to watch content and communicate with another user.

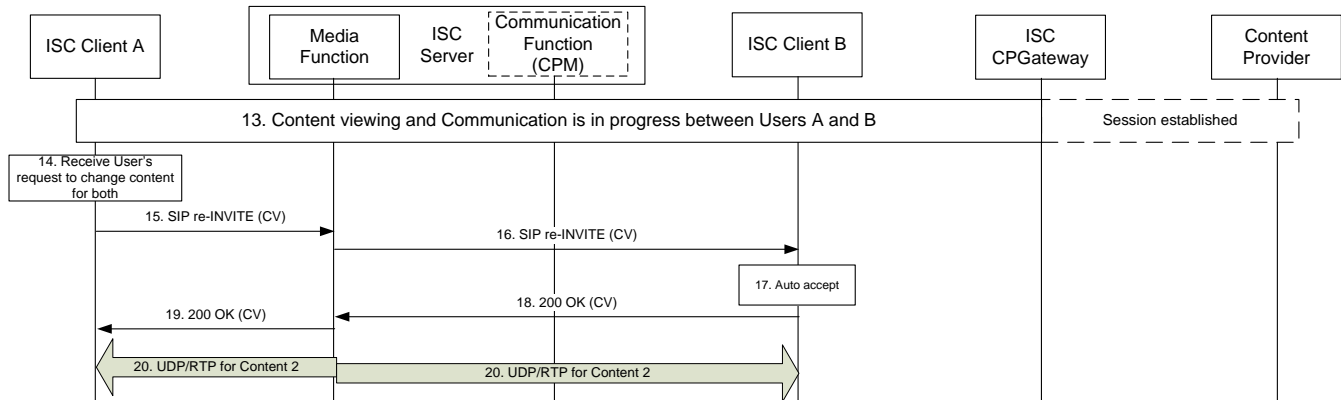


1. Upon receiving the request from User A to watch content and communicate along with User B, the ISC Client A gathers information related to the content from the Contents List.
2. ISC Client A sends a request SIP INVITE for Content Viewing (CV) towards the ISC Server Media Function including
  - the reference to content
  - information that there is an associated communication
  - target User B.
3. ISC Server Media Function relays the SIP INVITE (CV) for content viewing towards ISC Client B. ISC Client B knows that the User A request is intended for both content viewing and communication.
4. If an ISC session (CV) has not been established yet for the requested content, ISC Server A establishes an ISC session with the Content Provider through the ISC CP Gateway for receiving content.
5. Upon request from ISC/CPM Client A, CPM Client A sends a CPM 1-1 session request (SIP INVITE) towards the ISC Server Communication Function (CPM Participating Function) including
  - information that there is an associated content viewing
  - target User B.
6. ISC Server Communication Function (CPM Participating Function) relays the SIP INVITE for setting up communication towards ISC/CPM Client B.
7. Upon receiving acceptance from User B for content viewing, the ISC Client B sends back a response 200 OK (CV).
8. ISC Server Media Function relays the SIP 200 (CV) response accepting to set up content viewing session.

9. UDP/RTP channel is setup by ISC Server Media Function towards both ISC Client A and ISC Client B. ISC Server Media Function then transmits the media related to the content requested in Step 2, over the UDP/RTP channel to the ISC Client A and ISC Client B. User A and B are now watching the content.
10. Upon receiving acceptance from User B for communication, the ISC Client B sends back a response 200 OK (CM).
11. ISC Server Communication Function (CPM Participating Function) relays the SIP 200 OK response accepting to set up communication session.
12. MSRP channel is setup by ISC Server Communication Function (CPM Participating Function) towards both ISC/CPM Client A and ISC/CPM Client B for exchanging messages.
13. Users A and B are now watching the content together and communicating.

## C.2.2 Change Content Viewing

This section describes the case where an ISC Users are watching content and communicating, and one user requests to change content.

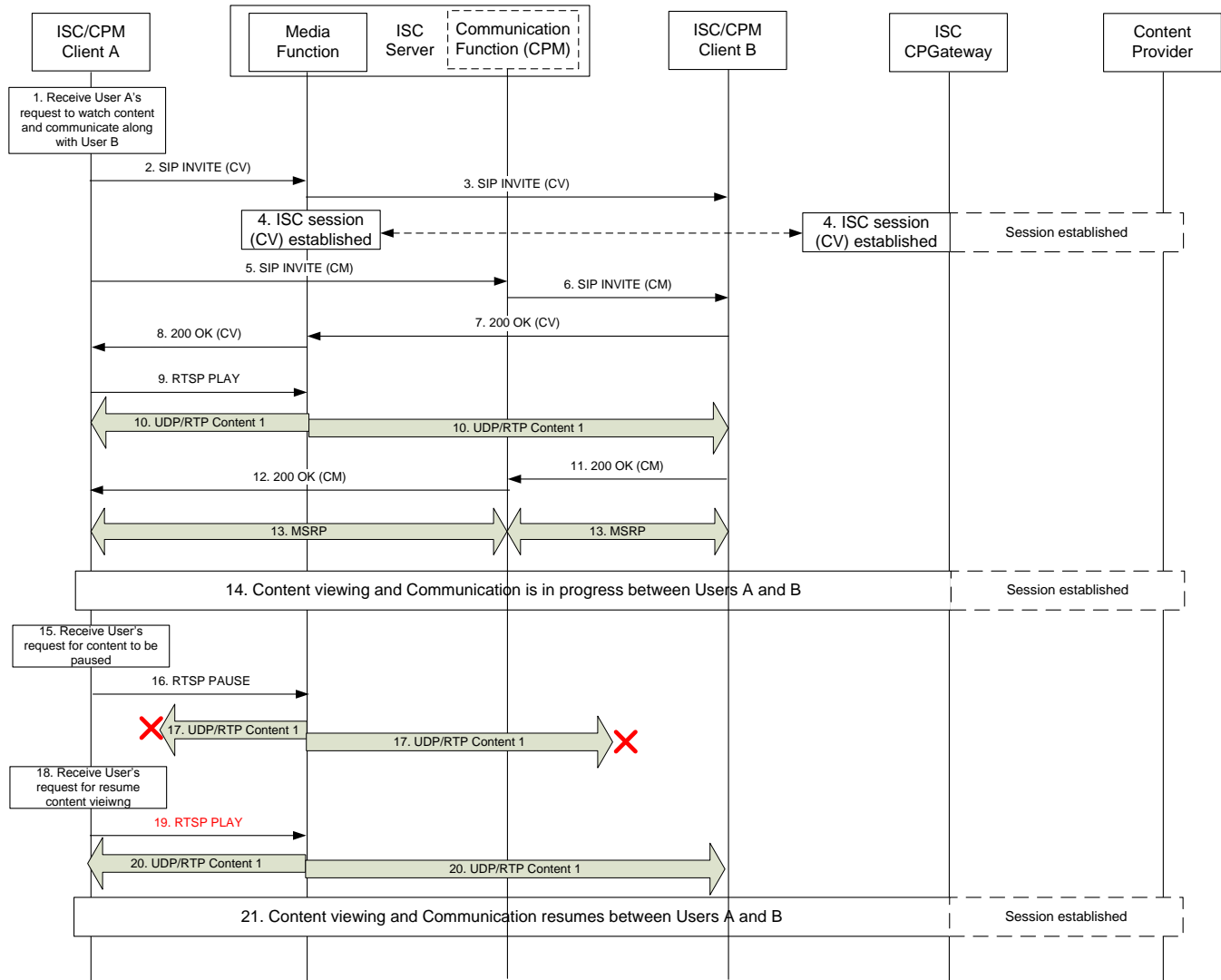


1. The following is assumed:
  - ISC Client A has already established an ISC Content Viewing and Communication session with ISC Client B as in shown in Figure. X.Y.Z11;
2. Upon receiving the request from User A to change content for both users, the ISC Client A gathers information related to new content (e.g. from the Contents List).
3. ISC Client A sends a request SIP re-INVITE (CV) towards the ISC Server Media Function including
  - the reference to new content
  - information that the change content is for both users
4. ISC Server Media Function relays the SIP re-INVITE (CV) for changing content viewing towards ISC Client B.
5. ISC Client B auto-accepts the invite for changing content viewing
6. The ISC Client B sends back a response 200 OK (CV).
7. ISC Server Media Function relays the SIP 200 (CV) response accepting to stream new content.
8. ISC Server Media Function then transmits the media related to the new content requested in Step 15 over the existing UDP/RTP channel to the ISC Client A and ISC Client B. User A and User B are now watching the new content.



### C.2.3 Control Content Viewing

This section describes the case an ISC User requests to watch content and communicate with another user and allowing user to control (e.g., start, stop, rewind, forward, skip etc).



1. Upon receiving the request from User A to watch content with controls and communicate along with User B, the ISC Client A gathers information related to the content from the Contents List.
2. ISC Client A sends a request SIP INVITE for content viewing (CV) including the reference to content towards the ISC Server Media Function for setting up an RTSP session.
3. ISC Server Media Function relays the SIP INVITE (CV) for content viewing towards ISC Client B. ISC Client B knows that the User A request is intended for both content viewing and communication.
4. If an ISC session (CV) has not been established yet for the requested content, ISC Server A establishes an ISC session with the Content Provider through the ISC CP Gateway for receiving content.
5. Upon request from ISC/CPM Client A to setup a communication session with ISC/CPM Client B, CPM Client A sends a CPM 1-1 session request (SIP INVITE) towards the ISC Server Communication Function (CPM Participating Function).
6. ISC Server Communication Function (CPM Participating Function) relays the SIP INVITE for setting up communication towards ISC/CPM Client B.

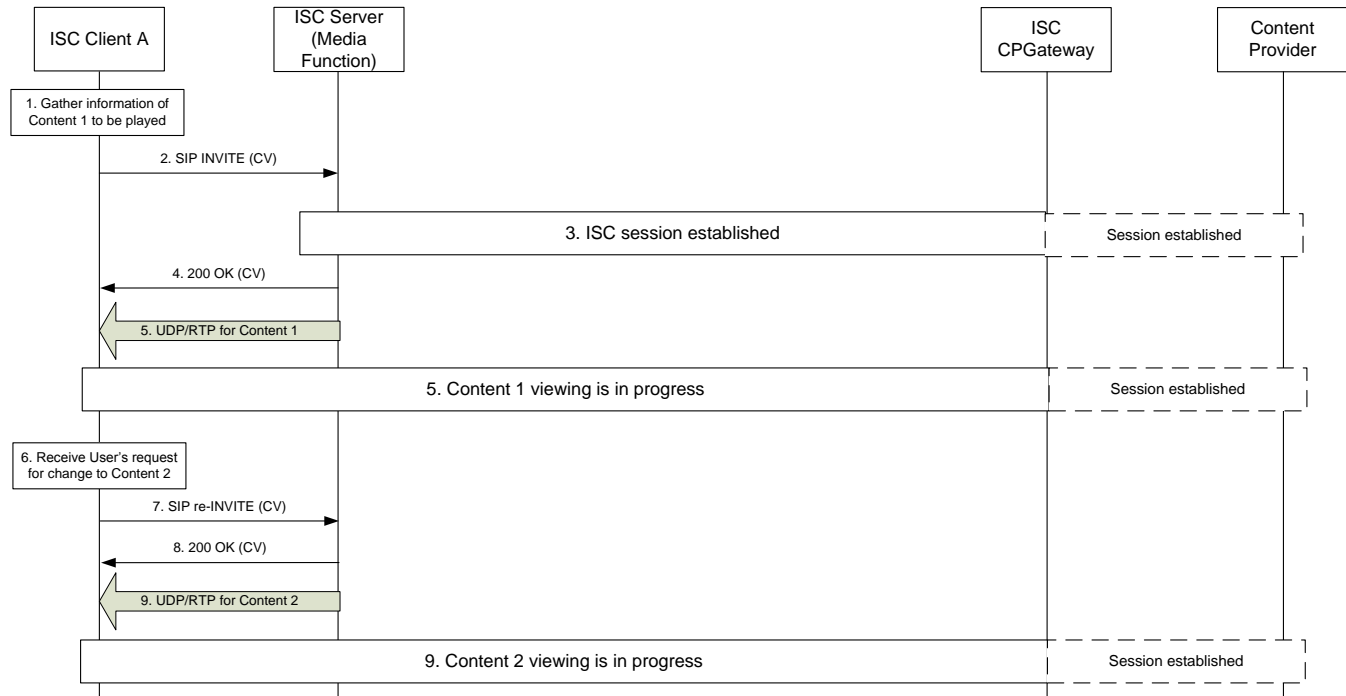
7. Upon receiving acceptance from User B for content viewing, the ISC Client B sends back a response 200 OK (CV).
8. ISC Server Media Function sends back a response (200 OK) accepting to process the request and setting up UDP/RTP channel for RTSP session.
9. ISC Client A sends RTSP PLAY to start receiving the content for both ISC Client A and ISC Client B, towards the ISC Server Media Function.
10. UDP/RTP channel for RTSP session is setup by ISC Server Media Function towards both ISC Client A and ISC Client B. ISC Server Media Function then transmits the media related to the content requested in Step 2, over the UDP/RTP channel to the ISC Client A and ISC Client B. User A and B are now watching the content.
11. Upon receiving acceptance from User B for communication, the ISC Client B sends back a response 200 OK.
12. ISC Server Communication Function (CPM Participating Function) relays the SIP 200 OK response accepting to set up communication session.
13. MSRP channel is setup by ISC Server Communication Function (CPM Participating Function) towards both ISC/CPM Client A and ISC/CPM Client B for exchanging messages.
14. Users A and B are now watching the content together and communicating.
15. ISC Client A receives a request from User A to pause the content.
16. ISC Client A sends RTSP PAUSE to temporarily halt receiving the content, towards the ISC Server Media Function.
17. ISC Server Media Function then stops transmitting the media over the UDP/RTP channel for both ISC Client A and ISC Client B.
18. ISC Client A receives a request from User A to resume the content.
19. ISC Client A sends RTSP PLAY to continue receiving the content, towards the ISC Server Media Function.
20. ISC Server Media Function then resumes transmitting the media over the UDP/RTP channel to both ISC Client A and ISC Client B. User A and User B has now resumed watching the content.
21. Users A and B are now watching the content together and communicating.

Note: ISC Client A can also send the following RTSP controls at any time after the ISC session is established: forward, rewind, skip, etc, according to the rules and procedures of [RFC2326].

## C.3 Self Content Viewing

### C.3.1 Change Content Viewing

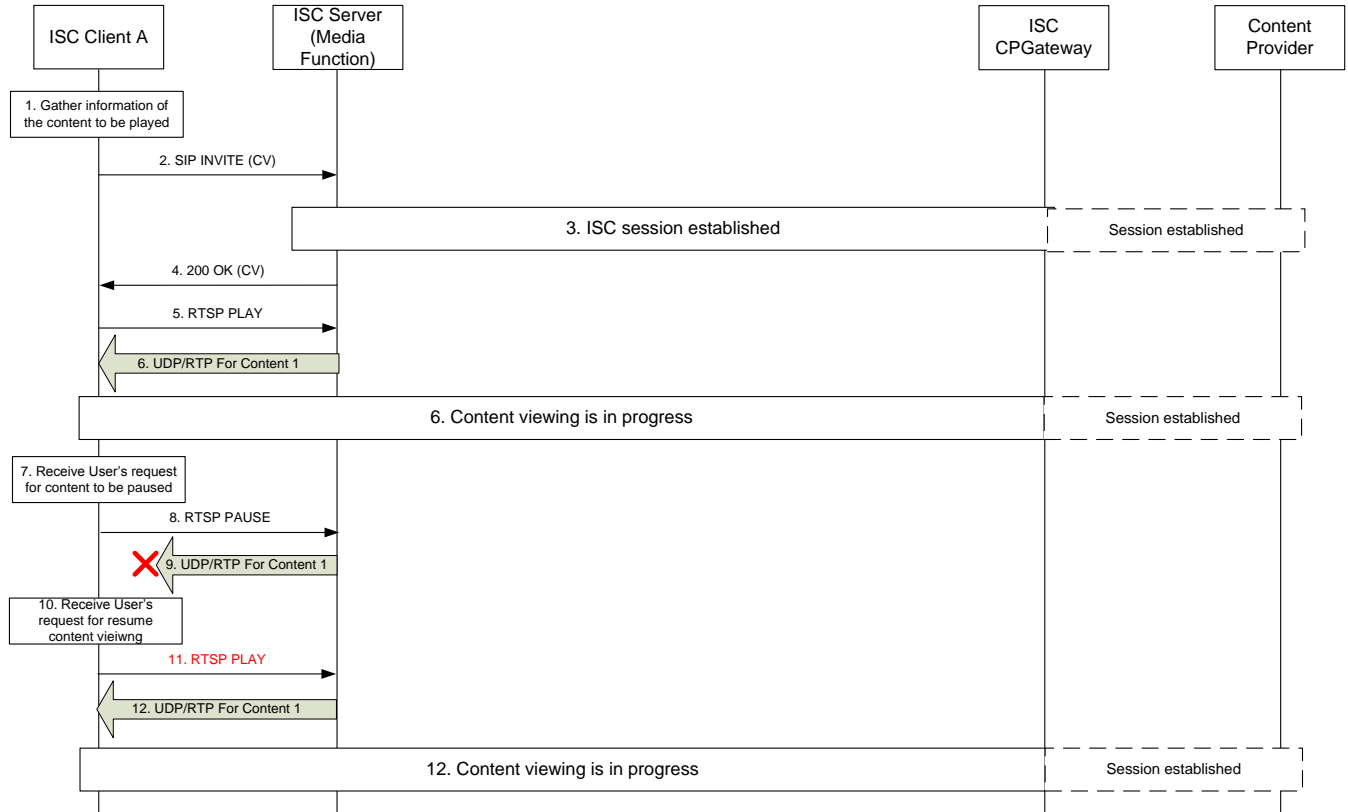
This section describes the case where an ISC User A requests to deliver content and allowing user to change to another content.



1. Upon receiving the request from User A to watch content, the ISC Client A gathers information related to the content from the Contents List.
2. ISC Client A sends a request (SIP INVITE) for content viewing (CV) including the reference to content towards the ISC Server A (Media Function).
3. If an ISC session has not been established yet for the requested content, ISC Server A establishes an ISC session with the Content Provider through the ISC CP Gateway for receiving content.
4. ISC Server Media Function sends back a response (200 OK) accepting to process the request and setting up UDP/RTP channel.
5. ISC Server Media Function then transmits the media related to the content requested in Step.2 over the UDP/RTP channel to the ISC Client A. User A is now watching the content.
6. Upon receiving the request from User A to change content, the ISC Client A gathers information related to new content from the Contents List.
7. ISC Client A sends a request (SIP re-INVITE) including the reference to new content towards the ISC Server Media Function.
8. ISC Server Media Function sends back a response (200 OK) accepting to process the request.
9. ISC Server Media Function then transmits the media related to the new content requested in Step 7 over the existing UDP/RTP channel to the ISC Client A. User A is now watching the new content.

### C.3.2 Control Content Viewing

This section describes the case where an ISC User A requests to deliver content and allowing user to control (e.g., start, stop, rewind, forward, skip etc).



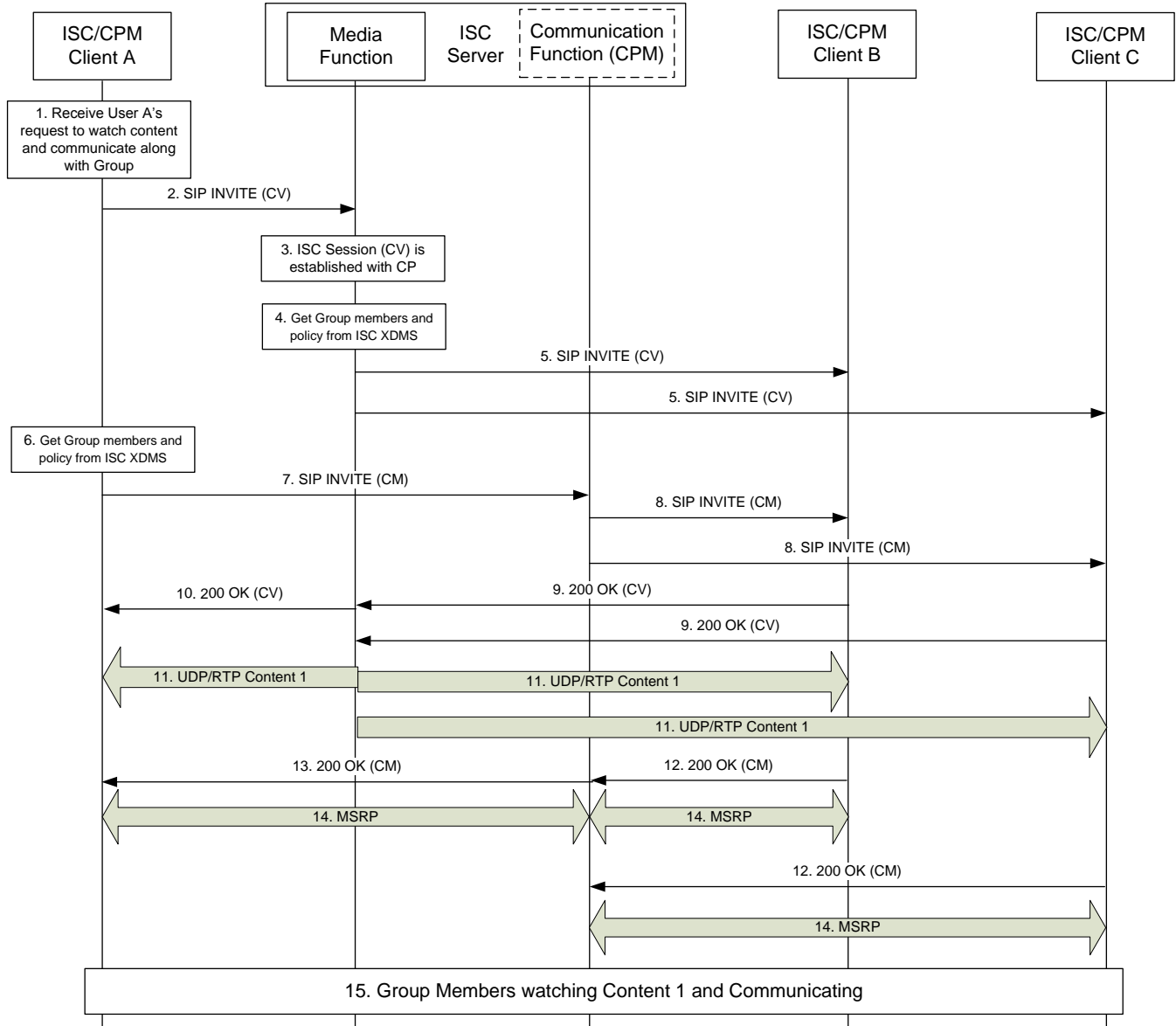
1. Upon receiving the request from User A to watch content with controls, the ISC Client A gathers information related to the content from the Contents List.
2. ISC Client A sends a request (SIP INVITE) for content viewing (CV) including the reference to content towards the ISC Server Media Function for setting up an RTSP session.
3. If an ISC session has not been established yet for the requested content, ISC Server A establishes an ISC session with the Content Provider through the ISC CP Gateway for receiving content.
4. ISC Server Media Function sends back a response (200 OK) accepting to process the request and setting up UDP/RTP channel for RTSP session.
5. ISC Client A sends RTSP PLAY to start receiving the content, towards the ISC Server Media Function.
6. ISC Server Media Function then transmits the media related to the content requested in Step.2 over the UDP/RTP channel to the ISC Client A. User A is now watching the content.
7. ISC Client A receives a request from User A to pause the content.
8. ISC Client A sends RTSP PAUSE to temporarily halt receiving the content, towards the ISC Server Media Function.
9. ISC Server Media Function then stops transmitting the media over the UDP/RTP channel.
10. ISC Client A receives a request from User A to resume the content.
11. ISC Client A sends RTSP PLAY to continue receiving the content, towards the ISC Server Media Function.
12. ISC Server Media Function then resumes transmitting the media over the UDP/RTP channel to the ISC Client A. User A has now resumed watching the content.

Note: ISC Client A can also send the following RTSP controls at any time after the ISC session is established: forward, rewind, skip, etc, according to the rules and procedures of [RFC2326].

## C.4 Pre-defined Group Content Viewing and Communication Session Management

### C.4.1 Establish a Content Viewing and Communication Session with a Pre-defined Group

This section describes the case where an ISC User requests to establish a content viewing and communication session with a pre-defined Content Viewing Group.

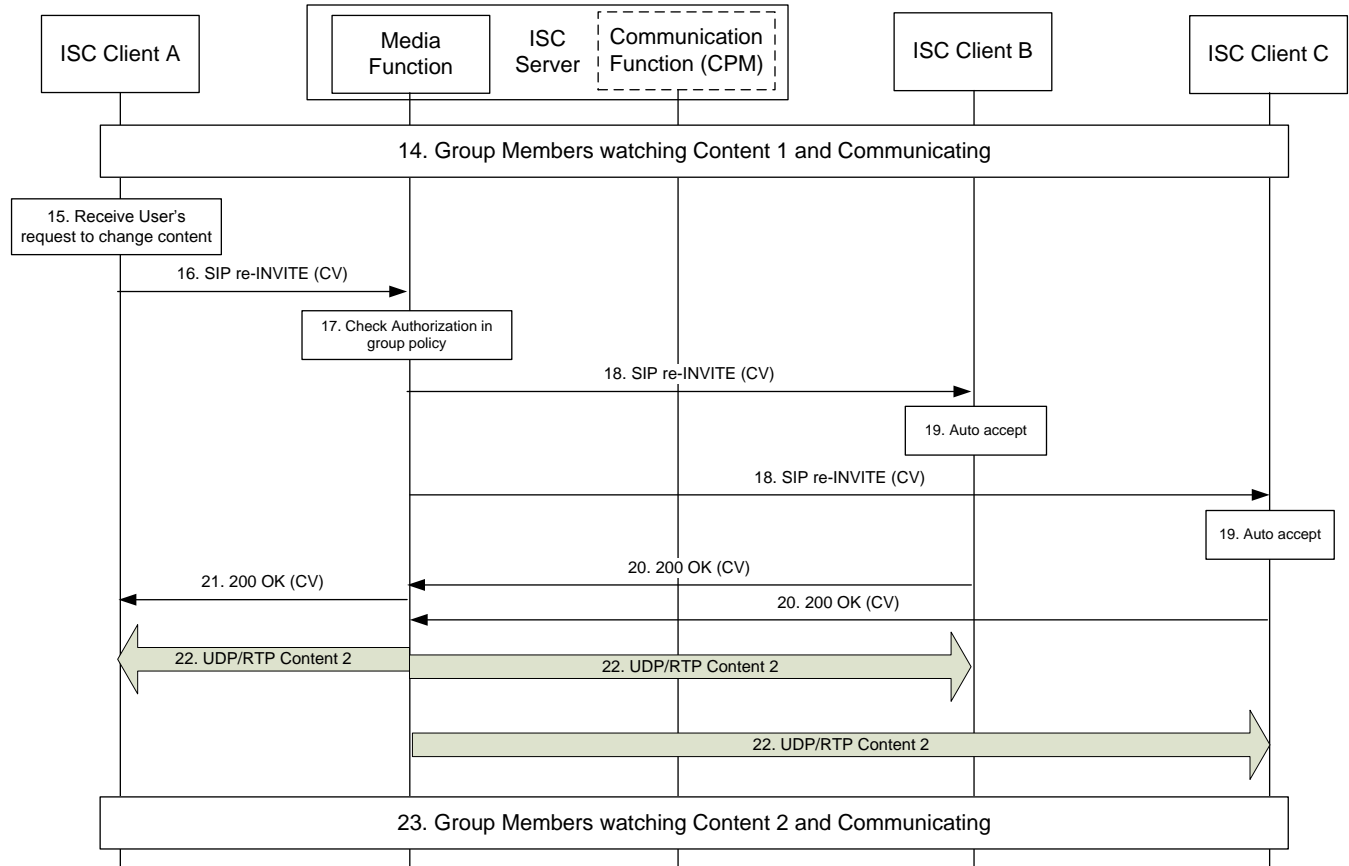


1. Upon receiving the request from User A to watch content and communicate in pre-defined Group, the ISC Client A gathers information related to the content from the Contents List and the identity of the pre-defined group.
2. ISC Client A sends a request SIP INVITE for Content Viewing (CV) towards the ISC Server Media Function including
  - the reference to content

- pre-defined group identity
3. If an ISC session (CV) has not been established yet for the requested content, ISC Server A establishes an ISC session with the Content Provider through the ISC CP Gateway for receiving content.
  4. ISC Server Media Function gets the group members and group policy for the pre-defined group in ISC XDMS.
  5. ISC Server Media Function relays the SIP INVITE (CV) for content viewing towards each group member.
  6. ISC Client A retrieves the group members for the pre-defined group in ISC XDMS.
  7. Upon request from ISC/CPM Client A, CPM Client A sends a CPM Group session request (SIP INVITE) towards the ISC Server Communication Function (CPM Participating Function) including the members of pre-defined group in URI List.
  8. ISC Server Communication Function (CPM Participating Function) relays the SIP INVITE for setting up communication towards each member of the pre-defined group.
  9. Upon receiving acceptance from group member for content viewing, the respective ISC Client sends back a response 200 OK (CV).
  10. ISC Server Media Function relays the SIP 200 (CV) response accepting to set up content viewing session.
  11. UDP/RTP channel is setup by ISC Server Media Function towards all the group members accepting the content viewing. ISC Server Media Function then transmits the media related to the content requested in Step 2, over the UDP/RTP channel to the pre-defined group members. Users of pre-defined group are now watching the content.
  12. Upon receiving acceptance from group member for communication, the respective ISC/CPM Client sends back a response 200 OK.
  13. ISC Server Communication Function (CPM Participating Function) relays the SIP 200 OK response accepting to set up communication session.
  14. MSRP channel is setup by ISC Server Communication Function (CPM Participating Function) towards all the group members accepting the communication session invite for exchanging messages.
  15. Users of pre-defined group are now watching the content together and communicating.

### C.4.2 Change Content Viewing

This section describes the case where an ISC Users are watching content and communicating, and one user requests to change content.

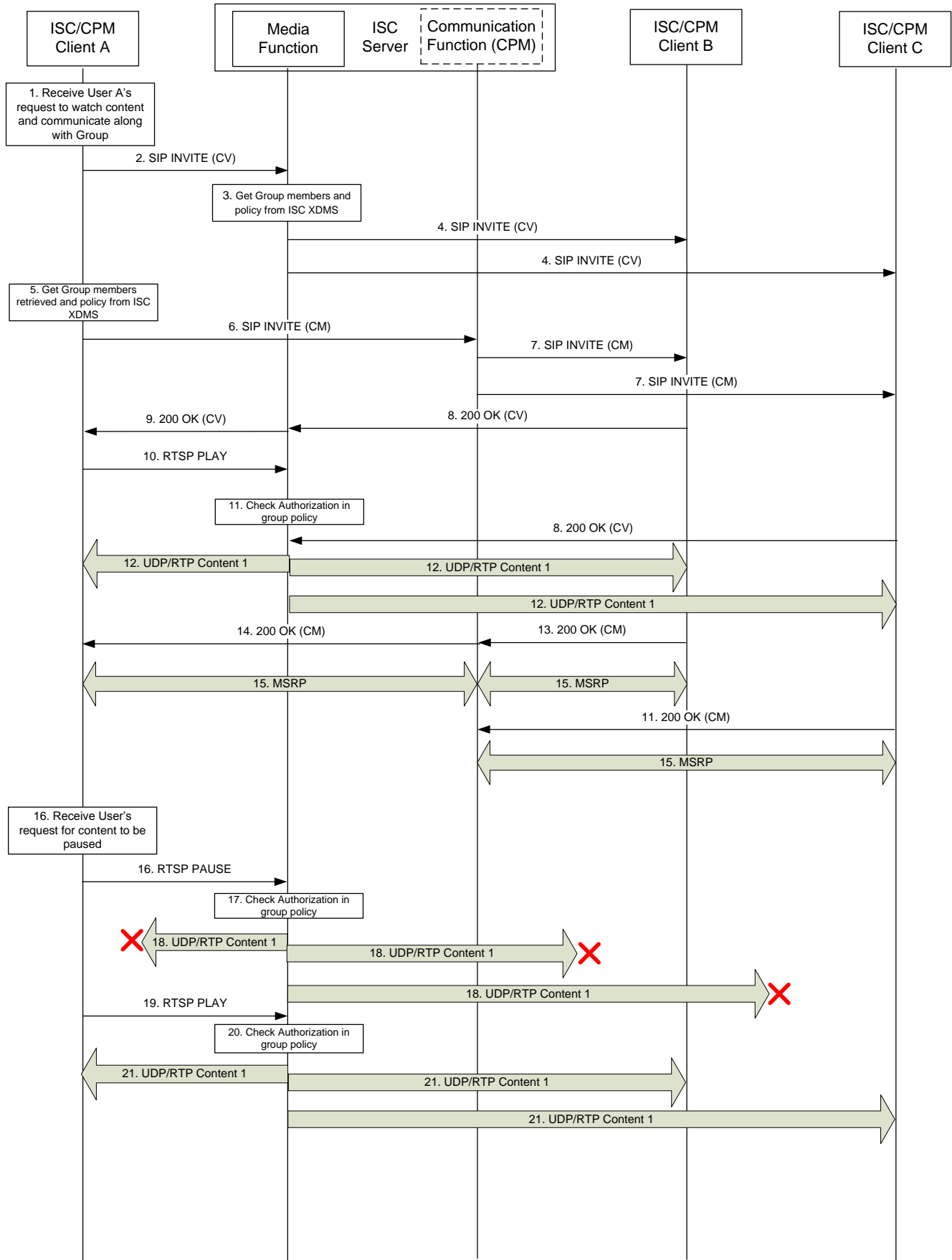


1. The following is assumed:
  - ISC Client A has already established an ISC Content Viewing and Communication session with pre-defined group as shown in Figure. X.Y.Z11;
2. Upon receiving the request from User A to change content for the group, the ISC Client A gathers information related to new content from the Contents List.
3. ISC Client A sends a request SIP re-INVITE (CV) towards the ISC Server Media Function including
  - the reference to new content
  - pre-defined group
4. ISC Server Media Function checks the authorization in group policy.
5. ISC Server Media Function relays the SIP re-INVITE (CV) for changing content viewing towards group members.
6. ISC Client's of group members auto-accept the invite for changing content viewing
7. And the corresponding ISC Client sends back a response 200 OK (CV).
8. ISC Server Media Function relays the SIP 200 (CV) response to ISC Client A accepting to stream new content.
9. ISC Server Media Function then transmits the media related to the new content requested in Step 16 over the existing UDP/RTP channel to all the group members.
10. Users of pre-defined group are now watching the new content together and communicating.



### C.4.3 Control Content Viewing with a Pre-defined Group

This section describes the case an ISC User requests to watch content and communicate with another user and allowing user to control content viewing (e.g., start, stop, rewind, forward, skip etc).



1. Upon receiving the request from User A to watch content with controls and communicate along with group members, the ISC Client A gathers information related to the content (e.g. from the contents list) and the identity of the pre-defined group.
2. ISC Client A sends a request SIP INVITE for content viewing (CV) including the reference to content towards the ISC Server Media Function for setting up an RTSP session for a pre-defined group.
3. ISC Server Media Function gets the group members and group policy for the pre-defined group in ISC XDMS.
4. ISC Server Media Function relays the SIP INVITE (CV) for content viewing towards each group member.
5. ISC Client A retrieves the group members for the pre-defined group in ISC XDMS.
6. Upon request from ISC/CPM Client A, CPM Client A sends a CPM Group session request (SIP INVITE) towards the ISC Server Communication Function (CPM Participating Function) including the members of pre-defined group in URI List.
7. ISC Server Communication Function (CPM Participating Function) relays the SIP INVITE for setting up communication towards each member.
8. Upon receiving acceptance from group member for content viewing, the respective ISC Client sends back a response 200 OK (CV).
9. ISC Server Media Function relays the SIP 200 OK (CV) response accepting to set up UDP/RTP channel for RTSP session.
10. ISC Client A sends RTSP PLAY to start distributing the content to the group, towards the ISC Server Media Function.
11. ISC Server Media Function checks if ISC Client A is authorized to control the playing of content to all group members.
12. UDP/RTP channel for RTSP session is setup by ISC Server Media Function towards all the group members accepting content viewing. ISC Server Media Function then transmits the media related to the content requested in Step 2, over the UDP/RTP channel. Group members are now watching the content.
13. Upon receiving acceptance from group member for communication, the respective ISC/CPM Client sends back a response 200 OK.
14. ISC Server Communication Function (CPM Participating Function) relays the SIP 200 OK response accepting to set up communication session.
15. MSRP channel is setup by ISC Server Communication Function (CPM Participating Function) towards all the group members accepting the communication session invite for exchanging messages. Users of pre-defined group are now watching the content together and communicating.
16. ISC Client A receives a request from User A to pause the content. ISC Client A sends RTSP PAUSE to temporarily halt receiving the content, towards the ISC Server Media Function.
17. ISC Server Media Function checks group policy to authorize.
18. ISC Server Media Function then stops transmitting the media over the UDP/RTP channel all the group members.
19. ISC Client A receives a request from User A to resume the content. ISC Client A sends RTSP PLAY to continue receiving the content, towards the ISC Server Media Function.
20. ISC Server Media Function checks group policy to authorize.
21. ISC Server Media Function then resumes transmitting the media over the UDP/RTP channel to the group. User A and User B has now resumed watching the content.

Note: ISC Client A can also send the following RTSP controls at any time after the ISC session is established: forward, rewind, skip, etc, according to the rules and procedures of [RFC2326].

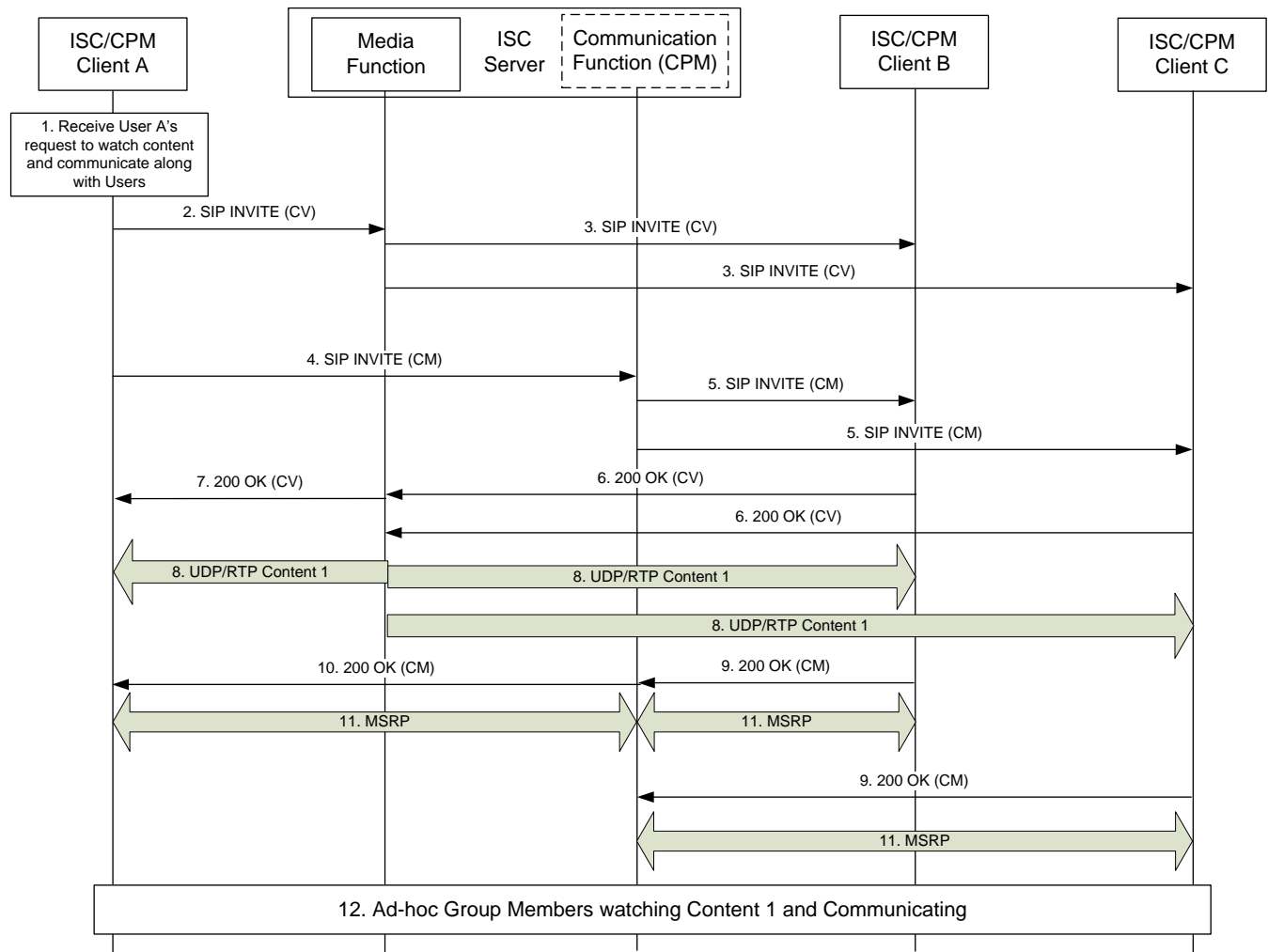
## C.5 Ad-hoc Group Content Viewing and Communication session management

### C.5.1 Establish a Content Viewing and Communication session with an Ad-hoc Group

This section describes the case where an ISC User requests to establish a Content Viewing and Communication session with Ad-hoc Content Viewing Group.

The following is assumed:

- ISC Server A has already established an ISC session with the Content Provider for receiving content;

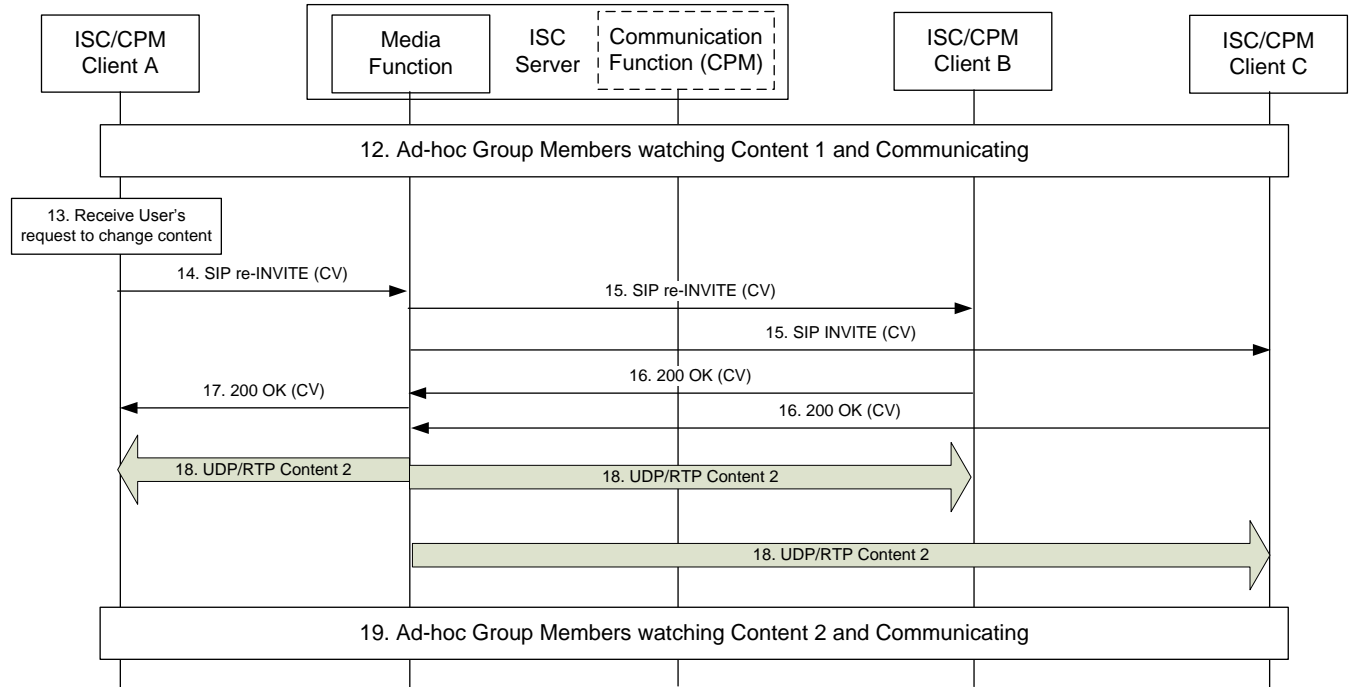


1. Upon receiving the request from User A to watch content and communicate with Ad-hoc Group, the ISC Client A gathers information related to the content from the Contents List.
2. ISC Client A sends a request SIP INVITE for Content Viewing (CV) towards the ISC Server Media Function including
  - The reference to content
  - URI list of Ad-hoc group
3. The ISC Server Media Function relays the SIP INVITE (CV) for Content Viewing towards each group member.

4. Upon request from ISC/CPM Client A, the CPM Client A sends a CPM Group session request (SIP INVITE) towards the ISC Server Communication Function (CPM Participating Function) including the members of Ad-hoc group in the URI list.
5. ISC Server Communication Function (CPM Participating Function) relays the SIP INVITE for setting up the Communication towards each member.
6. Upon receiving the acceptance from group member for Content Viewing, the respective ISC Client sends back a response 200 OK (CV).
7. ISC Server Media Function relays the SIP 200 OK (CV) response to ISC Client A accepting to setup Content Viewing session.
8. UDP/RTP channel is setup by ISC Server Media Function towards all the group members accepting the Content Viewing. ISC Server Media Function then transmits the media related to the content request in Step 2, over the UDP/RTP channel to the Ad-hoc group members. Users of the Ad-hoc group members are now watching the content.
9. Upon receiving acceptance from group member for Communication, the respective ISC/CPM Client sends back a response 200 OK.
10. ISC Server Communication Function (CPM Participating Function) relays the SIP 200 OK response to ISC/CPM Client A accepting to setup Communication session.
11. MSRP channel is setup by ISC Server Communication Function (CPM Participating Function) towards all the group members accepting the Communication session invite for exchanging messages.
12. Users of Ad-hoc group are now watching the content together and communicating.

### C.5.2 Change Content Viewing

This section describes the case where an ISC Users are watching content and communicating, and one user requests to change content.



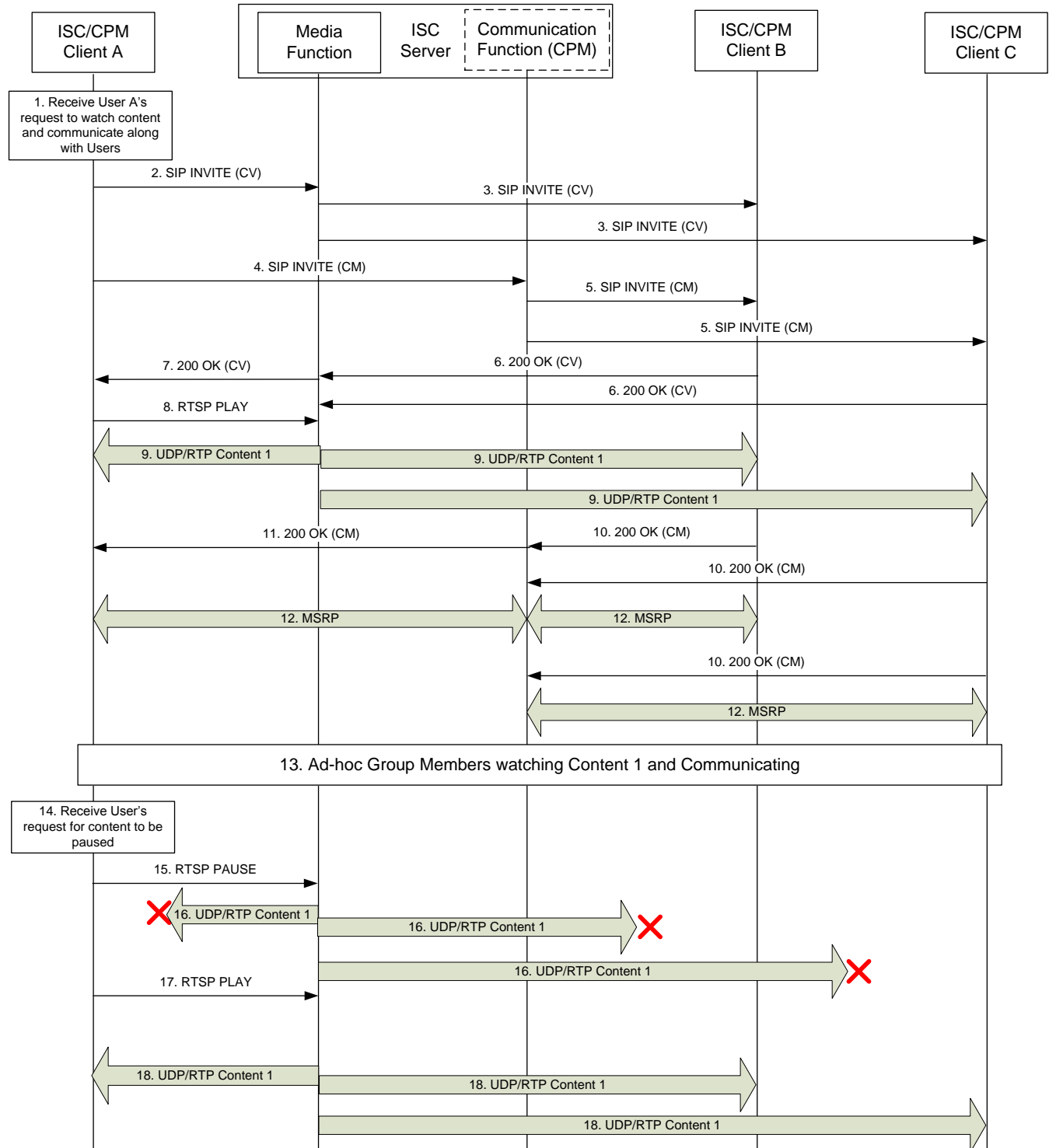
1. The following is assumed:
  - ISC Client A has already established an ISC Content Viewing and Communication session with Ad-hoc group as shown in Figure. X.Y.Z11
2. Upon receiving the request from User A to change content for the group, the ISC Client A gathers information related to the new content from the Contents List.
3. ISC Client A sends a request SIP re-INVITE (CV) towards the ISC Server Media Function including
  - The reference to new content
  - URI list of Ad-hoc group
4. ISC Server Media Function relays the SIP re-INVITE (CV) for changing Content Viewing towards group members.
5. And the corresponding ISC Client sends back a response 200 OK (CV).
6. ISC Server Media Function relays the SIP 200 OK (CV) response to ISC Client A accepting to stream new content.
7. ISC Server Media Function then transmits the media related to the new content requested in Step 14 over the existing UDP/RTP channel to all the group members.
8. Users of Ad-hoc group are now watching the new content together and communicating.

### C.5.3 Control Content Viewing with a Ad-hoc Group

This section describes the case an ISC User requests to watch content and communicate with another user and allowing user to control Content Viewing (e.g., start, stop, rewind, forward, skip etc.).

The following is assumed:

- ISC Server A has already established an ISC session with the Content Provider for receiving content;



1. Upon receiving the request from User A to watch content with controls and communicate along with group members, the ISC Client A gathers information related to the content (e.g. from the contents list).
2. ISC Client A sends a request SIP INVITE for Content Viewing (CV) including the reference to content and URI list of Ad-hoc group towards the ISC Server Media Function for setting up an RTSP session for a Ad-hoc group.
3. ISC Server Media Function relays the SIP INVITE (CV) for Content Viewing towards each group member.
4. Upon request from ISC/CPM Client A, CPM Client A sends a CPM Group session request (SIP INVITE) towards the ISC Server Communication Function (CPM Participating Function) including the members of Ad-hoc group in URI List.
5. ISC Server Communication Function (CPM Participating Function) relays the SIP INVITE for setting up Communication towards each member.
6. Upon receiving acceptance from group member for Content Viewing, the respective ISC Client sends back a response 200 OK (CV).
7. ISC Server Media Function relays the SIP 200 OK (CV) response to ISC Client A accepting to setup UDP/RTP channel for RTSP session.
8. ISC Client A sends RTSP PLAY to start distributing the content to the group, towards the ISC Server Media Function.
9. UDP/RTP channel for RTSP session is setup by ISC Server Media Function towards all the group members accepting Content Viewing. ISC Server Media Function then transmits the media related to the content requested in Step 2, over the UDP/RTP channel. Group members are now watching the content.
10. Upon receiving acceptance from group member for Communication, the respective ISC/CPM Client sends back a response 200 OK.
11. ISC Server Communication Function (CPM Participating Function) relays the SIP 200 OK response to ISC/CPM Client A accepting to setup Communication session.
12. MSRP channel is setup by ISC Server Communication Function (CPM Participating Function) towards all the group members accepting the Communication session invite for exchanging messages.
13. Users of Ad-hoc group are now watching the content together and communicating.
14. ISC Client A receives a request from User A to pause the content.
15. ISC Client A sends RTSP PAUSE to temporarily halt receiving the content, towards the ISC Server Media Function.
16. ISC Server Media Function then stops transmitting the media over the UDP/RTP channel to all the group members.
17. ISC Client A receives a request from User A to resume the content. ISC Client A sends RTSP PLAY to continue receiving the content, towards the ISC Server Media Function.
18. ISC Server Media Function then resumes transmitting the media over the UDP/RTP channel to the group. User A, B and C has now resumed watching the content.

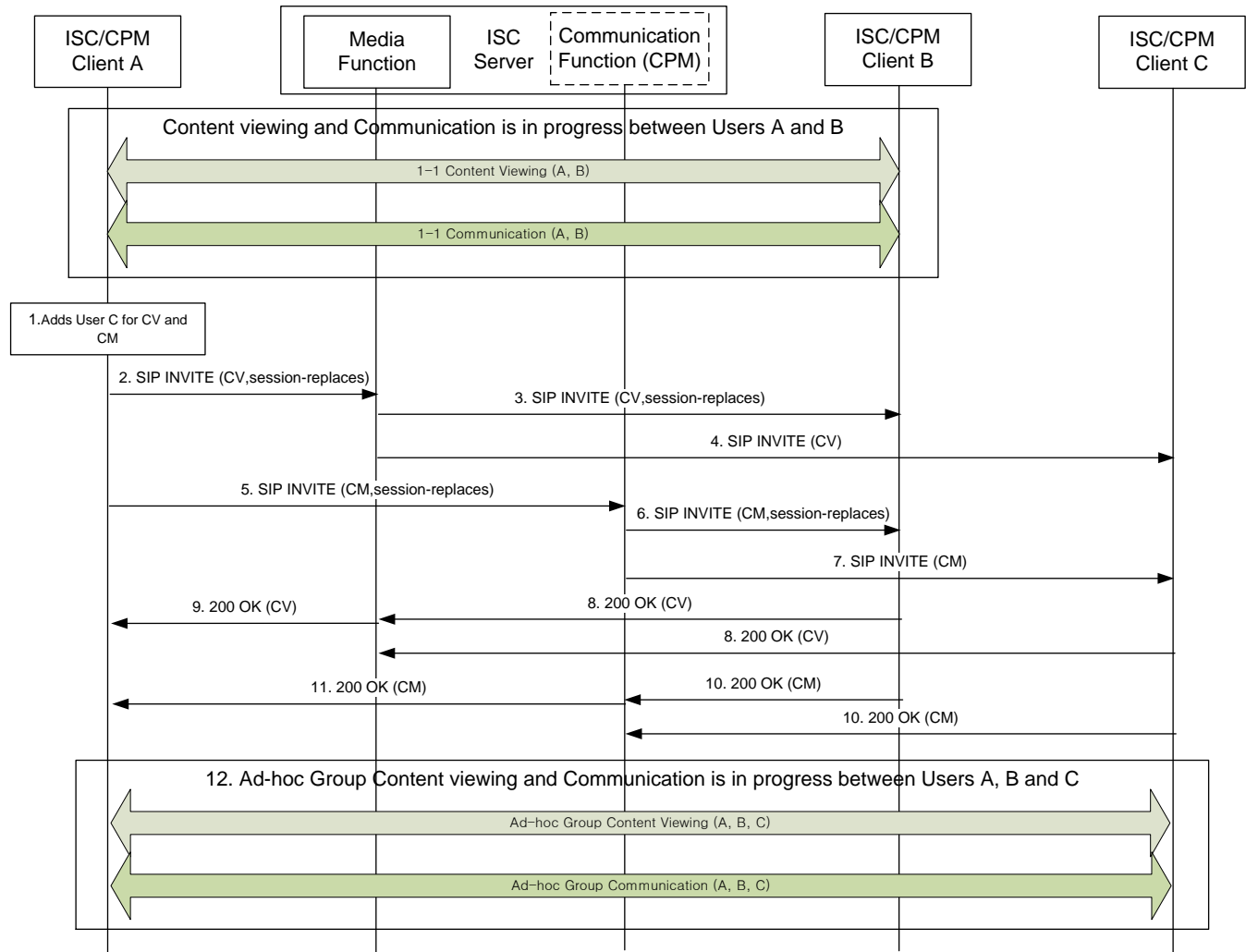


## C.6 Extending 1-1 Content Viewing and Communication to Ad-hoc Group Content Viewing and Communication

This section describes the case where an ISC User invites a new user to the 1-1 Content Viewing and Communication session.

The following is assumed:

- ISC Server A has already established 1-1 ISC Content Viewing and Communication session with Users A and B;

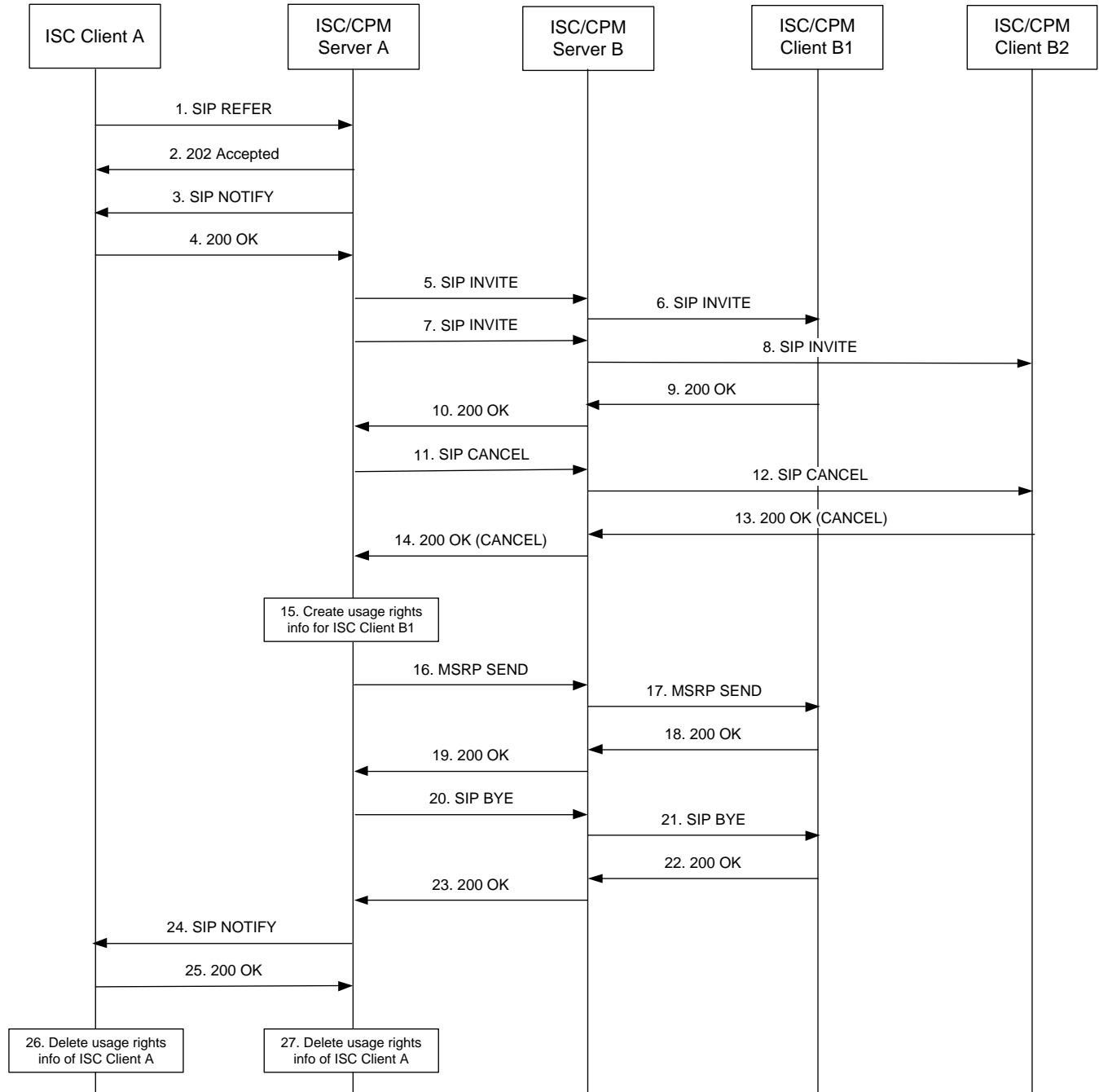


1. User A would like to add User C to the on-going 1-1 Content Viewing and Communication session between User A and B.
2. Upon receiving the request from User A to add User C to the on-going 1-1 Content Viewing session, the ISC Client A sends a request SIP INVITE for Content Viewing (CV) towards the ISC Server Media Function including
  - URI list of ISC Client B and C
  - Session-Replaces header for ISC Client B
3. The ISC Server Media Function relays the SIP INVITE (CV) with Session-Replaces header as defined in [RFC???] towards ISC Client B to replace the on-going 1-1 Content Viewing Session.
4. The ISC Server Media Function generates another request SIP INVITE (CV) for setting up the Content Viewing towards ISC Client C.

5. Upon request from ISC/CPM Client A to add ISC/CPM Client C to the on-going 1-1 Communication session, the CPM Client A sends a CPM 1-1 to Group session modification request (SIP INVITE) towards the ISC Server Communication Function (CPM Participating Function) including
  - URI list of ISC/CPM Client B and C
  - Session-Replaces header for ISC/CPM Client B
6. The ISC Server Communication Function (CPM Participating Function) relays the SIP INVITE with Session-Replaces header towards ISC/CPM Client B to replace the on-going 1-1 Communication Session.
7. The ISC Server Communication Function (CPM Participating Function) generates another request SIP INVITE for setting up the Communication towards ISC/CPM Client C.
8. Upon receiving the acceptance from User B and C for Content Viewing, the respective ISC Client sends back a response 200 OK (CV).
9. ISC Server Media Function relays the SIP 200 OK (CV) response to ISC Client A accepting to setup Content Viewing session.
10. Upon receiving acceptance from User B and C for Communication, the respective ISC/CPM Client sends back a response 200 OK.
11. ISC Server Communication Function (CPM Participating Function) relays the SIP 200 OK response to ISC/CPM Client A accepting to setup Communication session
12. The 1-1 Content Viewing and Communication session between User A and B will now be extended to Ad-hoc Group Content Viewing and Communication between Users A, B and C

## C.7 Delegating a Content Usage Right to other ISC Users

This section describes the case where an ISC User delegates his right to use a specific content to other ISC Users.



1. ISC Client A sends a request (SIP REFER) to ISC/CPM Server A to delegate his right to use a content to ISC/CPM Clients B1 and B2.
2. ISC/CPM Server A checks whether ISC Client A has authorization to delegate his/her content usage rights to the ISC/CPM Clients, and if so sends back a response (202 Accepted) to accept to process the request.
- 3-4. ISC/CPM Server A sends an initial notification (SIP NOTIFY) related to the delegation request to ISC Client A, which responds back (200 OK) to confirm the reception of the notification.

5-6. ISC/CPM Server A sends an invitation (SIP INVITE) as a CPM File Transfer towards ISC/CPM Server B to delegate ISC Client A's content usage right to ISC/CPM Client B1. ISC/CPM Server B relays the invitation to ISC/CPM Client B1.

7-8. Similarly, ISC/CPM Server A sends an invitation (SIP INVITE) as a CPM File Transfer towards ISC/CPM Server B to delegate ISC Client A's content usage right to ISC/CPM Client B2. ISC/CPM Server B relays the invitation to ISC/CPM Client B2.

9-10. ISC/CPM Client B1 sends back a response (200 OK) towards ISC/CPM Server B to accept the invitation to delegate ISC Client A's content usage right. ISC/CPM Server B relays the response to ISC/CPM Server A.

11-12. Since ISC/CPM Client B1 was the first to accept the delegation invitation, ISC/CPM Server A sends a request (SIP CANCEL) towards ISC/CPM Server B to cancel the delegation invitation that was sent to ISC/CPM Client B2. ISC/CPM Server B relays the cancellation request to ISC/CPM Client B2.

13-14. ISC/CPM Client B2 sends back a response (200 OK) towards ISC/CPM Server B to accept the cancellation request. ISC/CPM Server B relays the cancellation request to ISC/CPM Server A.

15. ISC/CPM Server A creates a new usage rights information for ISC/CPM Client B1.

16-17. ISC/CPM Server sends (MSRP SEND) the created usage rights information towards ISC/CPM Server B, which relays it to ISC/CPM Client B1.

18-19. ISC/CPM Client B1 sends back a response (200 OK) towards ISC/CPM Server B to confirm the reception of the usage rights information. ISC/CPM Server B relays the response to ISC/CPM Server A.

20-21. ISC/CPM Server A sends a request to close the session (SIP BYE) towards ISC/CPM Server B, which relays it to ISC/CPM Client B1.

22-23. ISC/CPM Client B1 sends back a response (200 OK) towards ISC/CPM Server B to accept the closure of the session. ISC/CPM Server B relays the response to ISC/CPM Server A.

24. ISC/CPM Server A notifies (SIP NOTIFY) ISC Client A that ISC/CPM Client B1 accepted the delegation request made earlier by ISC Client A, and received the corresponding usage rights.

25. ISC Client A sends back a response (200 OK) to ISC/CPM Server A to confirm the reception of the notification.

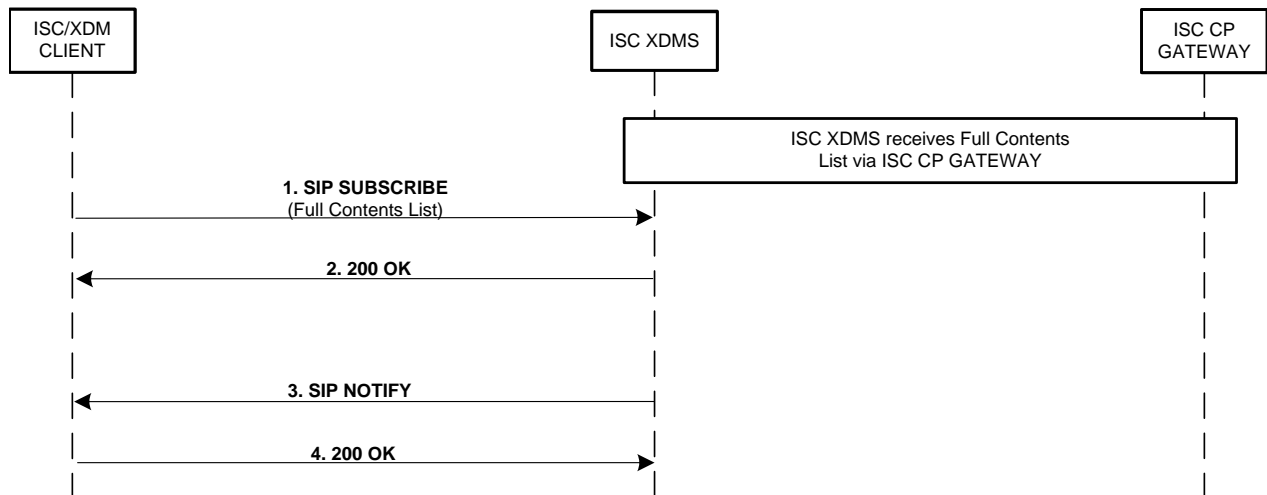
26-27. Both ISC Client A and ISC/CPM Server A deletes the usage rights information of ISC Client A as it is no longer valid.

## C.8 Receiving Full Contents List from CP

This section describes the case where an ISC User can receive the full Contents List document from the CP via ISC CP Gateway.

The following is assumed:

- ISC XDMS has already received full Contents List from the ISC CP GATEWAY. It is also assumed that ISC XDMS has subscribed for receiving the updates from the ISC CP Gateway in Contents List



1. ISC/XDM Client subscribes to Contents List document by sending SIP SUBSCRIBE request to the ISC XDMS with the application usage of the Contents List defined in [ISC-XDMS-TS]. This SIP SUBSCRIBE request is generated by the ISC/XDM Client:
  - a. with expires = 0 in header to receive the Full Contents List document only once, otherwise with expires = “non-zero value” in header according to the rules and procedures described in [RFC6665]
  - b. with “xcap-diff” event package to receive continuous updates to the Contents List document, according to the rules and procedures described in [OMA-XDM-TS].
  - c. MAY include the Suppress-If-Match header field, which directs the ISC XDMS to suppress either the body of a subsequent notification or the entire notification if the “ETag” value of the Content List document matches.
2. The ISC XDMS acknowledges with a 200 OK response.
3. The ISC XDMS generates a SIP NOTIFY including the full Contents List towards the ISC/XDM Client. If the SIP SUBSCRIBE request in Step.1 used an Expires header field with a non-zero value, then ISC XDMS generates a SIP NOTIFY every time when there is an update to Contents List document.
4. The ISC/XDM Client acknowledges with a 200 OK response towards the ISC XDMS.

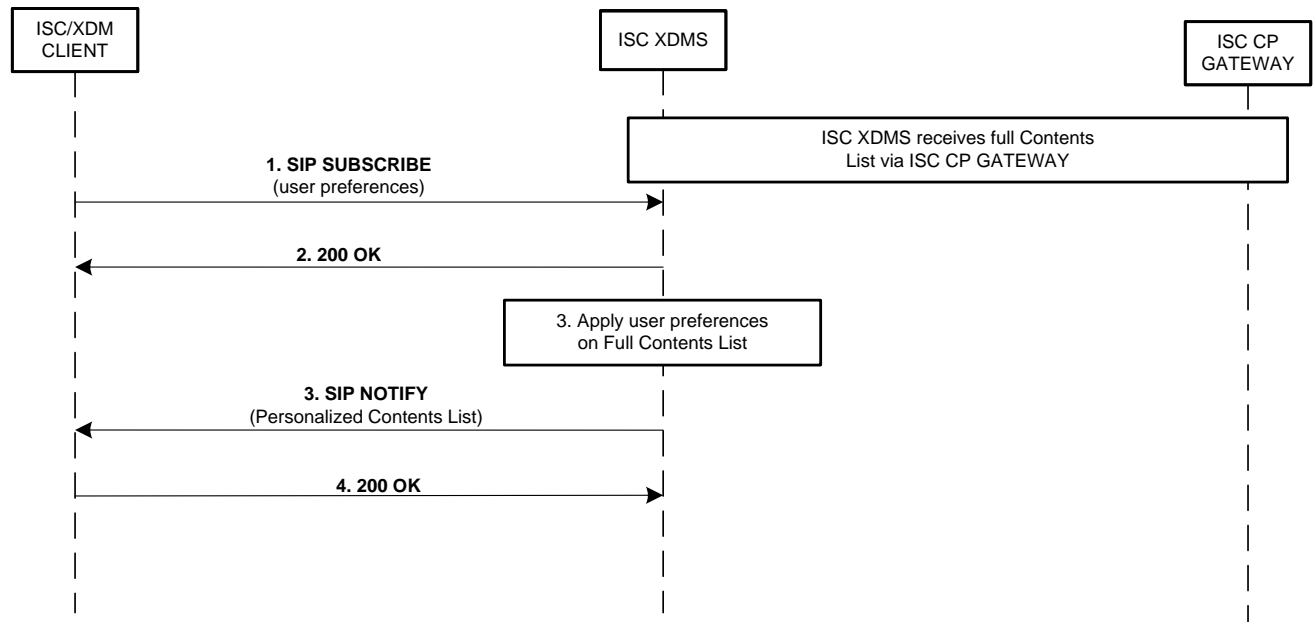
## C.9 Receiving Personalized Contents List

### C.9.1 Receiving Personalized Contents List based on On-demand user preferences and user's context information

This section describes the case where an ISC User can receive the Personalized Contents List from the ISC XDMS based on ISC user preferences and/or ISC User's context information (e.g., list of other contents related to content being watched).

The following is assumed:

- ISC XDMS has already received full Contents List from the ISC CP GATEWAY. It is also assumed that ISC XDMS has subscribed for receiving the updates from the ISC CP Gateway in Contents List



1. ISC/XDM Client subscribes to Contents List document by sending SIP SUBSCRIBE request including the user preferences and/or ISC User's context information (e.g. searching criteria), to the ISC XDMS with the application usage of the Contents List defined in [OMA-TS-ISC-XDMS]. This SIP SUBSCRIBE request is generated by the ISC/XDM Client:
  - a. with expires = 0 in header to receive Contents List document only once according to the rules and procedures described in [RFC6665]
  - b. with "xcap-diff" event package to receive continuous updates to the Contents List document, according to the rules and procedures described in [OMA-XDM-TS].
2. The ISC XDMS acknowledges with a 200 OK response.
3. The ISC XDMS sends a SIP NOTIFY to the ISC/XDM Client based on the filters (user preferences and/or user's context information) specified by the ISC/XDM Client in the SIP SUBSCRIBE request Step.1, generating a personalized Contents List body in the SIP NOTIFY.
4. The ISC/XDM Client acknowledges with a 200 OK response towards the ISC XDMS.

## C.10 Immersive Content Viewing

### C.10.1 Distribute Content Views according to Content View selection

This section describes the case where an ISC User requests to distribute contents according to his/her Content View selection.

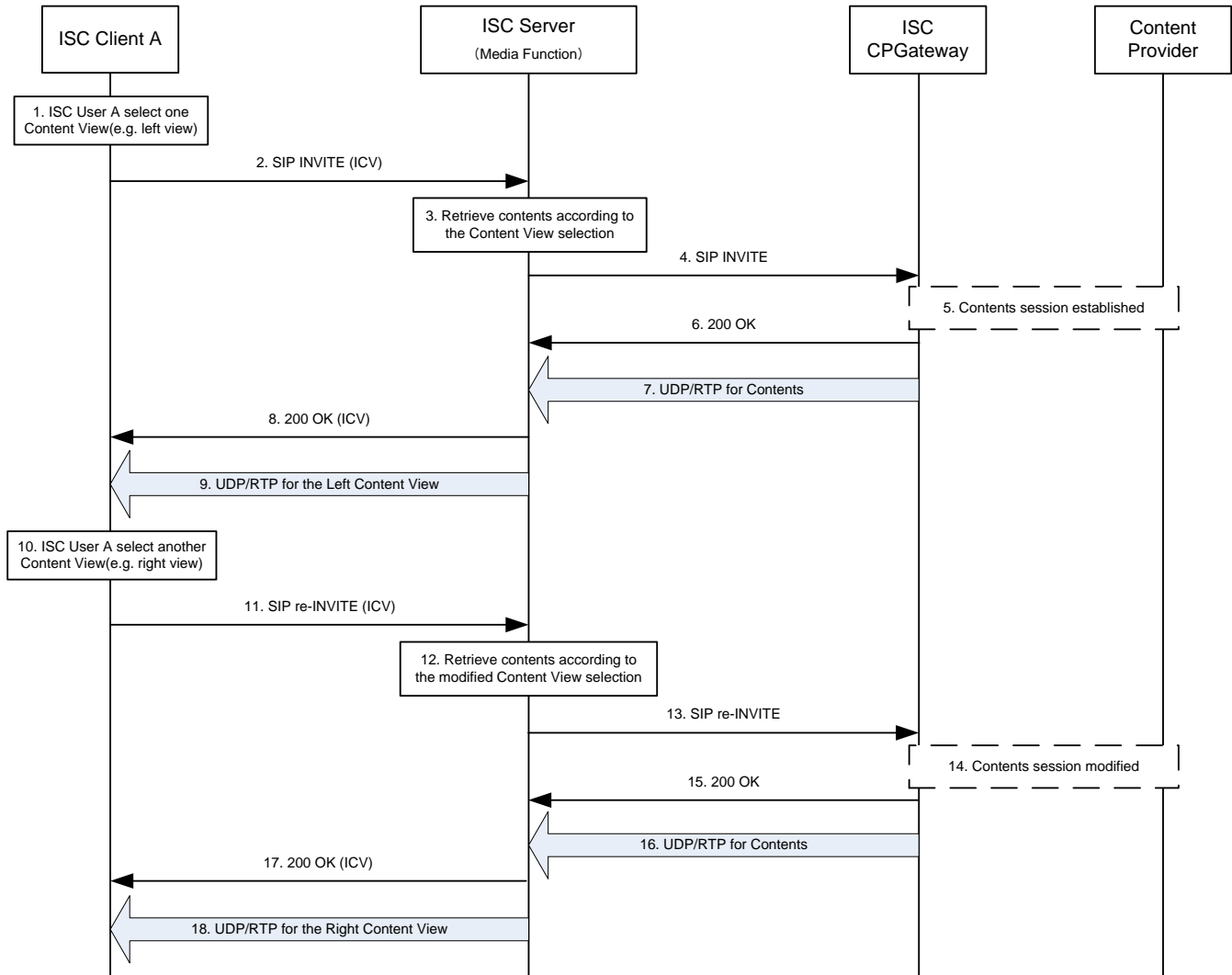


Figure 3: X.Y.1

1. ISC User A makes one specific Content View selection (e.g. left view) for the Immersive Content Viewing and request to watch.
2. ISC Client A sends a request (SIP INVITE) for Immersive Content Viewing (ICV) towards the ISC Server (Media Function) including information about the Content View selection
- 3-6. If an ISC session has not been established yet for the requested contents, ISC Server (Media Function) sends a request (SIP INVITE) towards ISC CPGateway. After contents session between ISC CPGateway and Content Provider is established, ISC CPGateway sends back a response (200 OK).
7. UDP/RTP channel is setup between ISC Server and ISC CPGateway. ISC CPGateway then transmits the media related to contents according to the Content View selection information, over the UDP/RTP channel to the ISC Media Function.
8. ISC Server sends back a response (200 OK) accepting to set up Immersive Content Viewing Session.

9. UDP/RTP channel is setup by the ISC Media Function towards ISC Client A. The ISC Media Function then transmits the media related to contents according to the Content View selection information, over the UDP/RTP channel to the ISC Client A. User A is now watching the specific Content View (e.g. left view).
10. After a while, the ISC User A selects another specific Content View (e.g. right view) and request to watch.
11. After a while, the ISC User A selects another specific Content View (e.g. right view) and request to watch.
12. ISC Client A sends a request (SIP re-INVITE) for Immersive Content Viewing (ICV) towards the ISC Server (Media Function) including the modified Content View selection information.
- 13-16. If an ISC session has not been established yet for the requested Content View, ISC Server sends a request (SIP re-INVITE) towards ISC CPGateway which contains the modified Content View selection information. ISC CPGateway sends back a response (200 OK).
17. ISC CPGateway then transmits the media related to the new contents according to the modified Content View selection information, over the existing UDP/RTP channel to the ISC Server.
18. Similarly, ISC Server sends back a response (200 OK) accepting to modify ISC Immersive Content Viewing Session.
19. The ISC Media Function then transmits the media related to the new contents according to the modified Content View selection information, over the existing UDP/RTP channel to the ISC Client A. User A is now watching the new Content View (e.g. right view).



## C.10.2 Distribute Content Views according to selected Spatial Configuration

This section describes the case where an ISC User requests to distribute contents according to his/her selected Spatial Configuration.

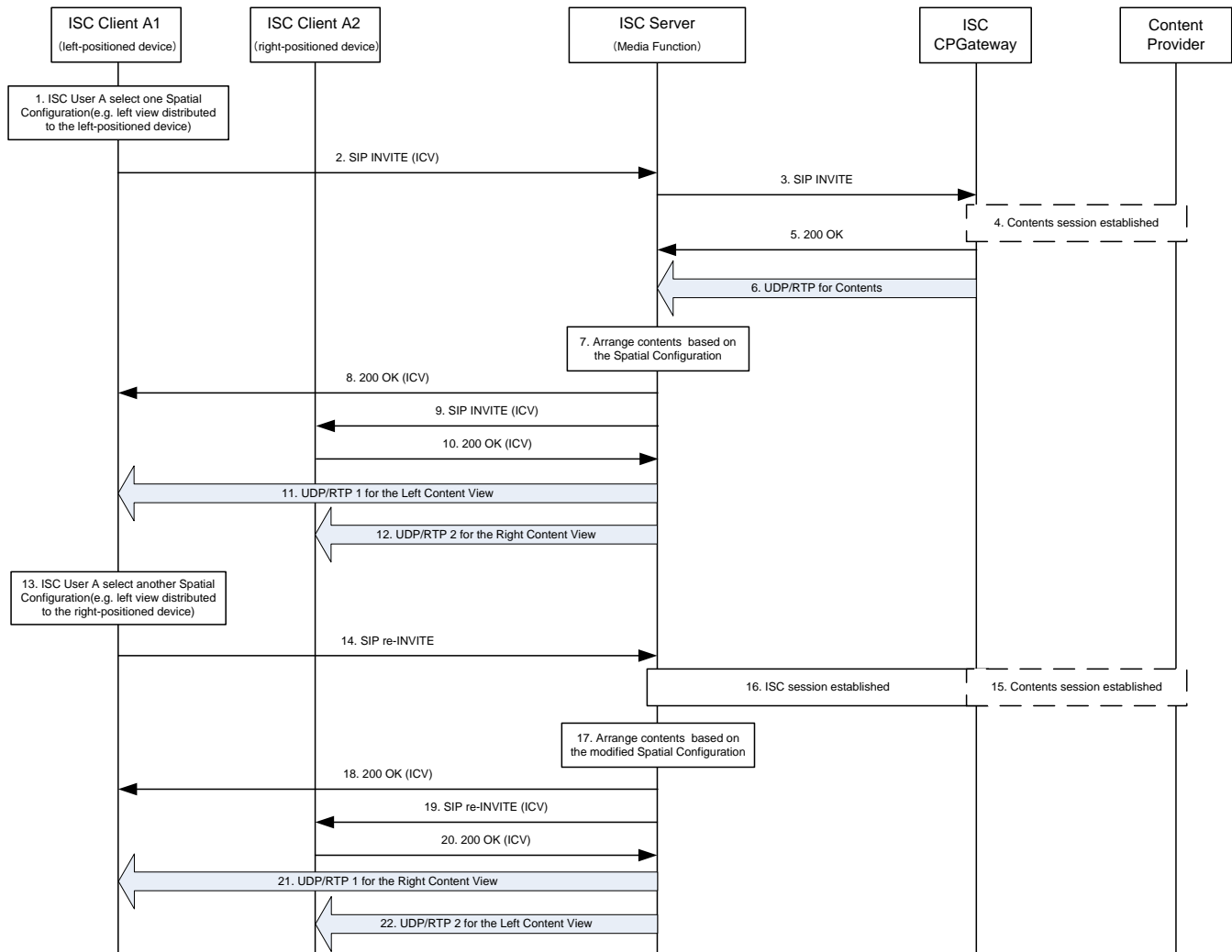


Figure 4: X.Y.2

1. ISC User A has two ISC enabled devices (corresponding to ISC Client A1 and A2). ISC User A wants to watch contents with his/her multiple devices, and he/she selects one specific Spatial Configuration (e.g. left view distributed to the left-positioned device) for the Immersive Content Viewing.

2. ISC Client A1 sends a request (SIP INVITE) for Immersive Content Viewing (ICV) towards the ISC Server (Media Function) including:

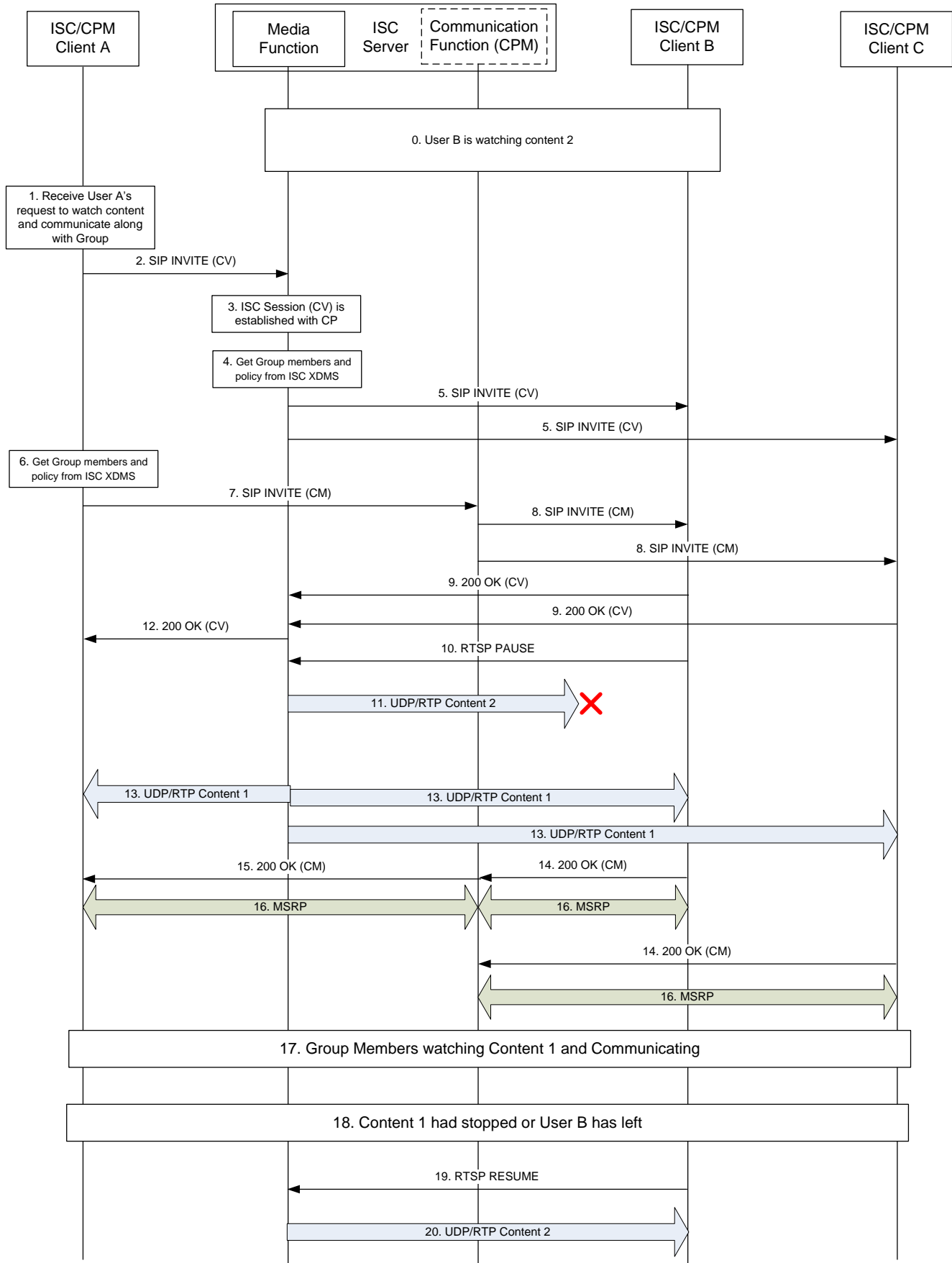
- the reference to content
- information about the selected Spatial Configuration

3-5. If an ISC session has not been established yet for the requested contents, ISC Server (Media Function) sends a request (SIP INVITE) towards ISC CPGateway. After contents session between ISC CPGateway and Content Provider is established, ISC CPGateway sends back a response (200 OK).

6. UDP/RTP channel is setup between ISC Server and ISC CPGateway. ISC CPGateway then transmits the media related to the contents requested in step 2, over the UDP/RTP channel to the ISC Media Function.
7. The ISC Server (Media Function) arranges contents based on the selected Spatial Configuration and generates recommendation of spatial distribution for the contents (e.g. left view distributed to the left-positioned device).
8. ISC Server sends a response (200 OK) back to ISC Client A1 accepting to set up Immersive Content Viewing Session.
- 9-10. Based on the generated spatial distribution, ISC Server (Media Function) sends also a request (SIP INVITE) to ISC Client A2. ISC Client A2 sends back a response (200 OK).
- 11-12. UDP/RTP channels are setup by the ISC Media Function towards ISC Client A1 and ISC Client A2 separately. The ISC Media Function then transmits the media related to contents according to the selected Spatial Configuration, over the UDP/RTP1 channel to the ISC Client A1 and UDP/RTP2 channel to the ISC Client A2. User A is now watching multiple Content Views simultaneously (e.g. left view distributed to the left-positioned device).
12. After a while, the ISC User A selects another specific Spatial Configuration (e.g. left view distributed to the right-positioned device) for the ongoing Immersive Content Viewing Session.
13. ISC Client A1 sends a request (SIP re-INVITE) for Immersive Content Viewing (ICV) towards the ISC Server (Media Function) including:
  - the reference to new content(optionally)
  - information about the selected Spatial Configuration
- 14-15. Similarly, if an ISC session has already been established for the requested contents and if the content for the newly selected Spatial Configuration is not available, the ISC Server (Media Function) retrieves the contents from Content Provider via ISC CPGateway.
16. The ISC Server (Media Function) arranges contents based on the modified Spatial Configuration and generates recommendation of spatial distribution for the contents (e.g. right view distributed to the left-positioned device).
17. Based on this request, ISC Server sends a response (200 OK) back to ISC Client A1 accepting to modify the Immersive Content Viewing Session.
- 18-19. Based on the generated spatial distribution, ISC Server (Media Function) sends also a request (SIP re-INVITE) to ISC Client A2. ISC Client A2 sends back a response (200 OK).
- 20-21. The ISC Media Function then transmits the media related to the new contents according to the modified Spatial Configuration, over the existing UDP/RTP1 channel to the ISC Client A1 and UDP/RTP2 channel to the ISC Client A2. User A is now watching multiple Content Views simultaneously (e.g. right view distributed to the left-positioned device).

## C.11 Resume Previous Content Viewing

This section describes the case where an ISC User to resume his/her previous content viewing, previously paused manually or automatically due to new content viewing.

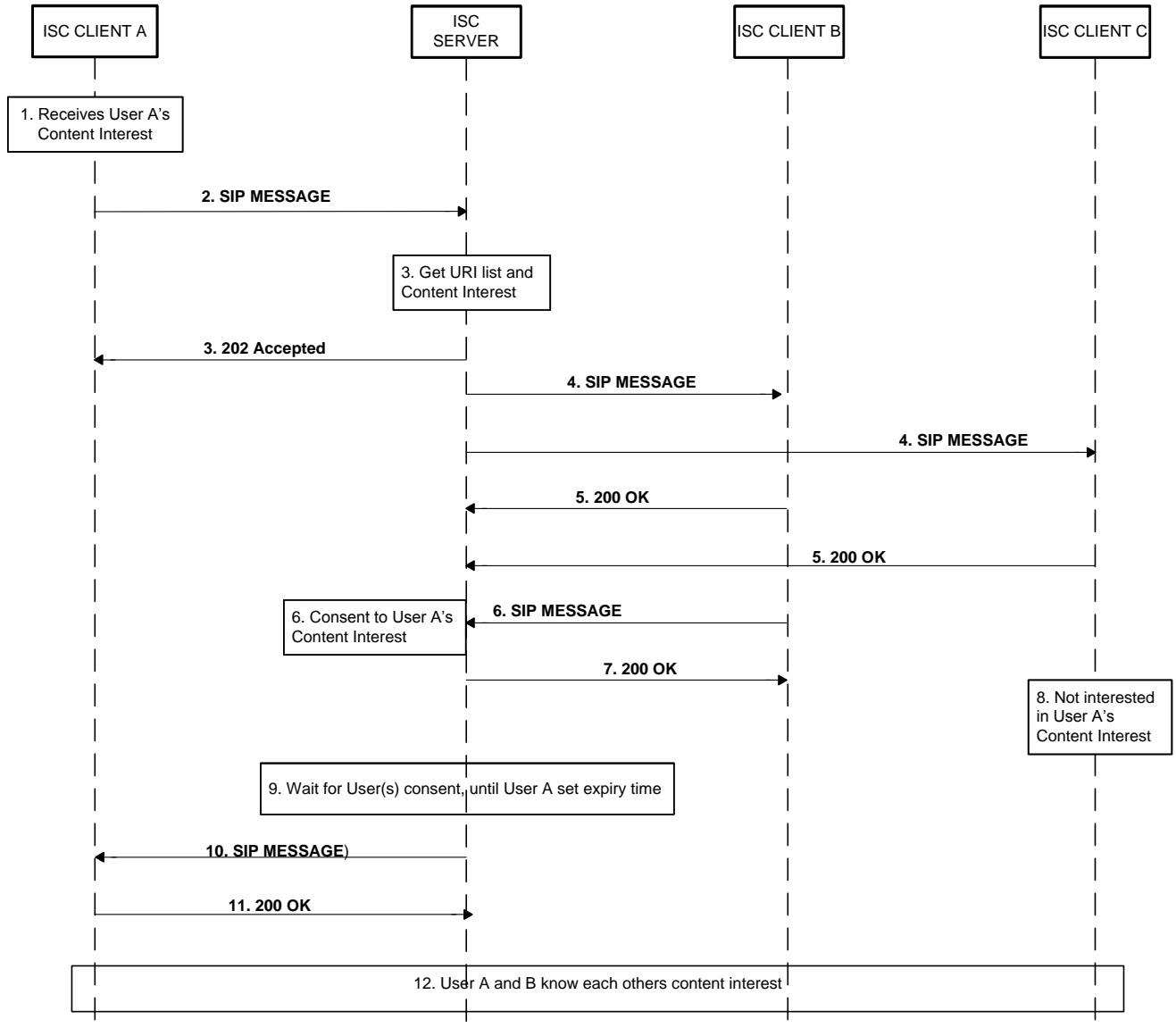


0. User B is watching content 2.
1. Upon receiving the request from User A to watch content and communicate in pre-defined Group, the ISC Client A gathers information related to the content from the Contents List and the identity of the pre-defined group.
2. ISC Client A sends a request SIP INVITE for Content Viewing (CV) towards the ISC Server Media Function including
  - a) the reference to content
  - b) pre-defined group identity
3. If an ISC session (CV) has not been established yet for the requested content, ISC Server A establishes an ISC session with the Content Provider through the ISC CP Gateway for receiving content.
4. ISC Server Media Function gets the group members and group policy for the pre-defined group in ISC XDMS.
5. ISC Server Media Function relays the SIP INVITE (CV) for content viewing towards each group member.
6. ISC Client A retrieves the group members for the pre-defined group in ISC XDMS.
7. Upon request from ISC Client A, CPM Client A sends a request SIP INVITE (CM) towards the ISC Server Communication Function (CPM) including the members of pre-defined group in URI List.
8. ISC Server Communication Function (CPM) relays the SIP INVITE (CM) for setting up communication towards each member.
9. Upon receiving acceptance from group member for content viewing, the respective ISC Client sends back a response 200 OK (CV).
10. ISC Client B sends RTSP PAUSE to the ISC Server Media Function to pause content 2.
11. ISC Server Media Function then stops transmitting the media over the UDP/RTP channel for ISC Client B.
12. ISC Server Media Function relays the SIP 200 (CV) response accepting to set up content viewing session.
13. UDP/RTP channel is setup by ISC Server Media Function towards all the group members accepting the content viewing. ISC Server Media Function then transmits the media related to the content requested in Step 2, over the UDP/RTP channel to the pre-defined group members. Users of pre-defined group are now watching the content.
14. Upon receiving acceptance from group member for communication, the respective ISC Client sends back a response 200 OK (CM).
15. ISC Server Communication Function relays the SIP 200 (CM) response accepting to set up communication session.
16. MSRP channel is setup by ISC Server Communication Function towards all the group members accepting the communication session invite for exchanging messages.
17. Users of pre-defined group are now watching the content together and communicating.
18. The content 1 has stopped or the User B has left the group.
19. ISC Client B sends RTSP PLAY to continue receiving content 2, towards the ISC Server Media Function.
20. ISC Server Media Function then resumes transmitting the media over the UDP/RTP channel to ISC Client B. User B has now resumed watching content 2.

## C.12 Content Interest

### C.12.1 Content Interest – Express Content Interest

This section describes the case where an ISC User is expressing interest to watch content to other ISC User(s).



**Figure 5: Expressing Content Interest Flow**

1. Upon receiving a request from User A expressing interest to view a content, ISC Client A gathers metadata information related to that content.
2. ISC Client A sends a SIP MESSAGE request towards other users including
  - content metadata of User A’s interested content
  - URI list of target users
  - expiry time

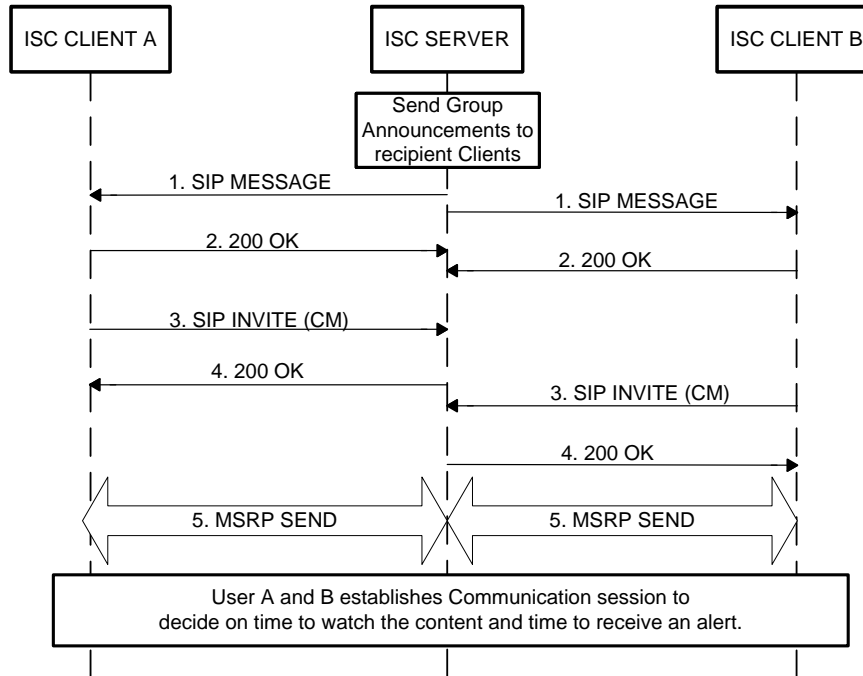
- optionally, intent to receive consent from other ISC Users
3. ISC Server (directly via SIP/IP Core) receives SIP MESSAGE including the User A's content interest and the URI list of the target user(s). ISC Server acknowledges ISC Client A with a SIP 202 Accepted response.
  4. ISC Server (directly via SIP/IP Core) forks the SIP MESSAGE containing User A's content interest towards each target user(s) – ISC Client B and C.
  5. ISC Client B and C acknowledge with a SIP 200 OK response.
  6. Upon receiving the consent from User B for the same content interest expressed by User A, ISC Client B sends a SIP MESSAGE including the consent towards ISC Client A.
  7. ISC Server returns SIP 200 OK response towards ISC Client B.
  8. User at ISC Client C ignores the content interest expressed by User A and hence no message generated towards ISC Client A.
  9. ISC Server may wait for the consent from the user(s) e.g., until the expiry time before generating the aggregated response. Otherwise, ISC Server generates the consent given by other users immediately.
  10. ISC Server (directly via SIP/IP Core) sends a SIP MESSAGE towards ISC Client A including User B's consent to the content interest expressed by User A. If there is more than one user expressed consent then the ISC Server generates SIP MESSAGE aggregating all the users giving consent and send towards the ISC Client A.
  11. ISC Client A returns SIP 200 OK response towards the ISC Server.
  12. User A and B knows each other's interest on viewing content together.

### C.12.2 Content Interest – announcing group creation

This section describes the case where an ISC User announces the creation of group to other ISC User(s) and negotiates the start time.

Assumption:

Upon receiving a request from User A to create a pre-defined group, ISC Client A is successful in creating a pre-defined group by sending a XCAP PUT request including URI list of users who will be members of pre-defined group and Group policies.



**Figure 6: Announcing Group Creation Flow**

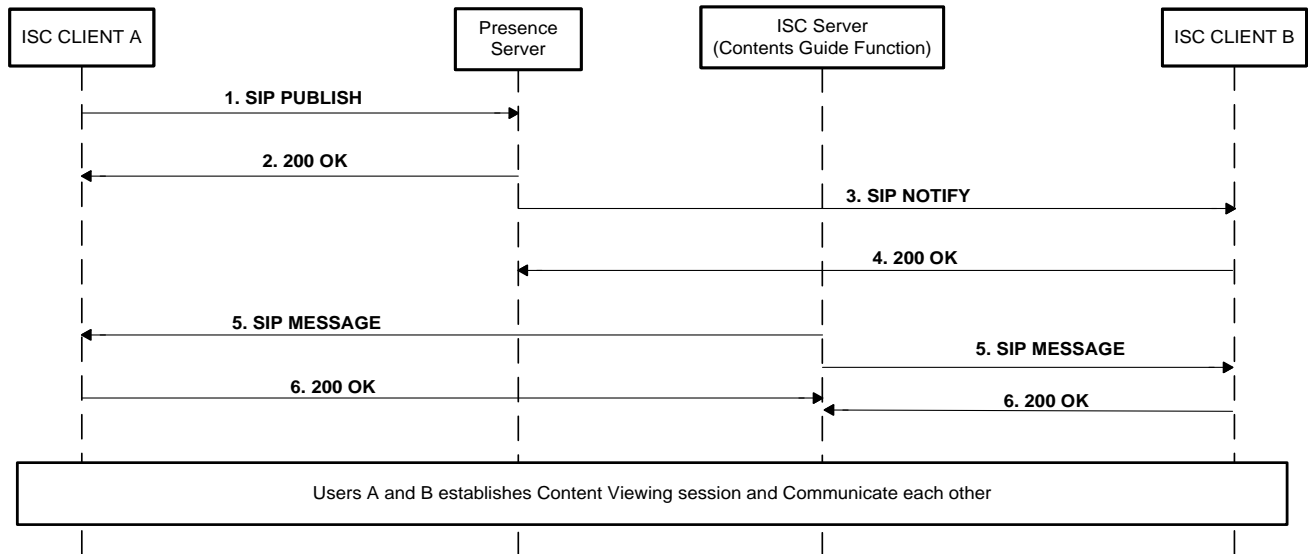
1. ISC User creates a new pre-defined group named “isc-viewing-group” in Group XDMS (application usage) and sets the <automatic-group-advertisement> element to true.
2. All group members are notified by the Group application usage about the creation of the new group.
3. Once the Group Identity information is known to group members (User’s A and B), upon request from the users, ISC Client A and B sends a request SIP INVITE (CM) towards the ISC Server to setup a Communication session.
4. ISC Server acknowledges with a SIP 200 OK response towards the group members.
5. Once the ISC Server accepts ISC Users request to join group communication, communication session is setup.

### C.12.3 Content Interest – receive alert notification before content delivery

This section describes the case where an ISC User receives alert notification before the content is delivered by the ISC Server.

The following is assumed:

- Group members agreed to watch content at a certain time.
- ISC User B is a watcher of ISC User A presence information



1. Upon receiving the request from User A to publish the time decided to watch content together, ISC Client A interacts with the Presence Source functionality on the device to send a SIP PUBLISH request including the timing decided to watch the content together and the time to send an alert to group members.
2. Presence Server responds back with a 200 OK to SIP PUBLISH request and aggregates the new data into the ISC User’s presence data.
3. Presence Server generates a SIP NOTIFY towards each of the ISC User’s current watchers e.g., user on ISC Client B.
4. ISC Clients acknowledges with a 200 OK response.
5. Upon elapse of the time to send alert, ISC Server (Contents Guide Function) generates a SIP MESSAGE including the alert information.
6. Each ISC Client(s) receiving the alert responds back with 200 OK response.



## C.13 ISC XDMS

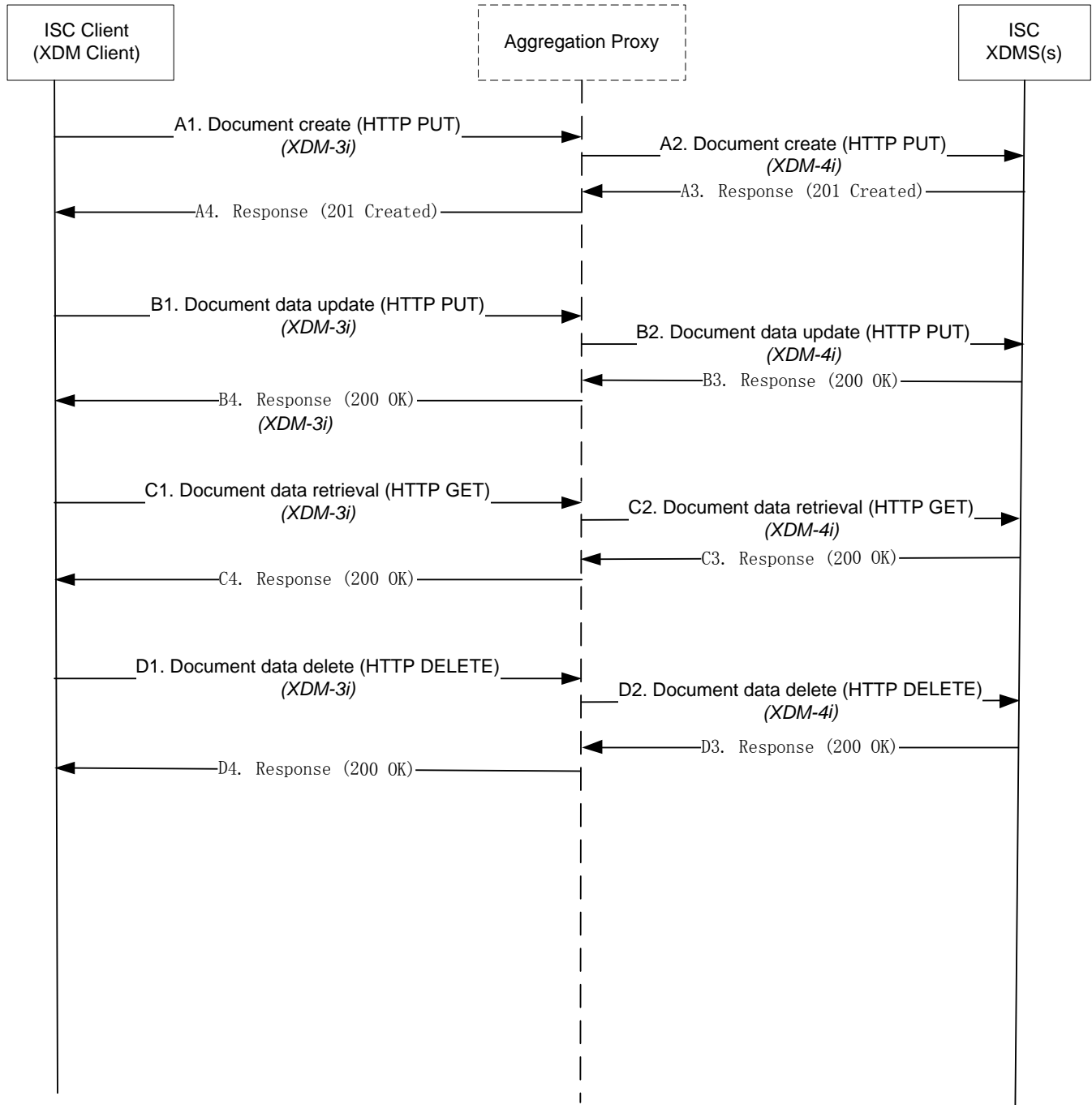
The flows in this section depict examples of ISC Client and ISC Server managing ISC XML Documents.

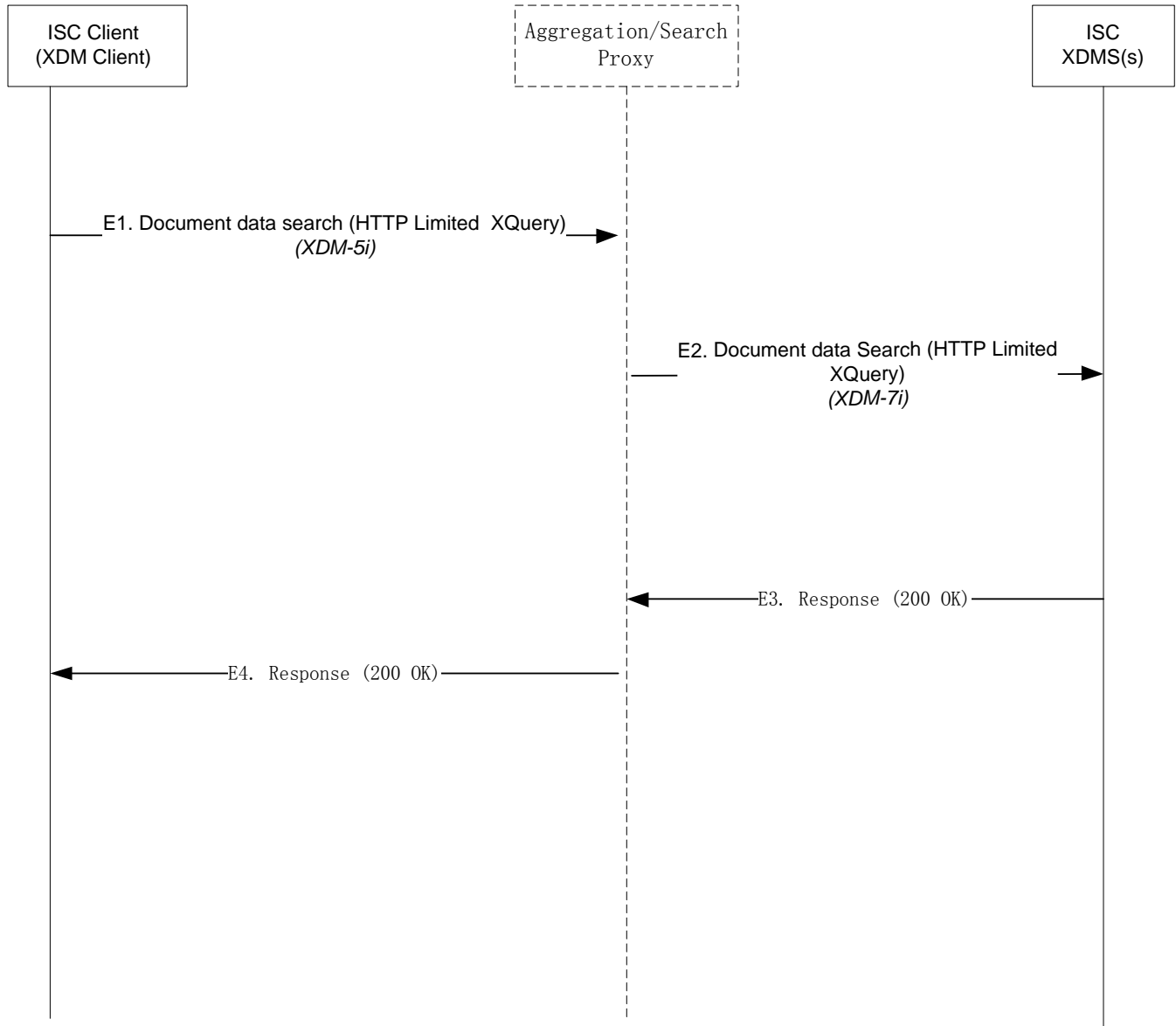
### C.13.1 Management of ISC XML Documents by ISC Client

This section describes the case where an ISC User is expressing interest to watch content to other ISC User(s).

.. In ISC Enabler, an ISC Client interacts with ISC XDMS(s) through XDM Client to manage ISC XML documents, The management operations are realized through XCAP operations as described in Appendix C.2 “Sample XCAP Message Flow” and 6.1.2 “XDM Operations using XCAP”, of [XDM Core]. This example describes the messages flows used by the ISC Client (XDM Client) to manipulate an ISC XML document in ISC XDMS(s) after authentication with XDM Proxy

(Aggregation Proxy/Search Proxy).





**Figure 7: Management of ISC XML Documents by ISC Client**

**Operation A: Creation of a document in ISC XDMS(s).**

A1) The ISC Client through XDM Client sends an HTTP PUT request using the XDM-3i interface, via the Aggregation Proxy to create a new ISC XML document “index” for a user in any of the ISC XDMS(s).

A2) Assuming that the ISC Client (XDM Client) was successfully authenticated, the ISC XDMS(s) receive the request over the XDM-4i interface from the XDM proxies (Aggregation Proxy).

A3) The ISC XDMS(s) acknowledge the creation of index document with a HTTP “201 Created” message, assuming that ISC Client(XDM Client) had the right Access Permissions to perform the create operation and the operation was successful

A4) The HTTP “201 Created” message is received by the ISC Client (XDM Client).

**Operation B: Document data update in ISC XDMS(s)**

B1) The ISC Client through XDM Client sends a HTTP PUT request over the XDM-3i interface, via the Aggregation Proxy to update the just-created “index” document.

B2) Assuming that the ISC Client (XDM Client) was successfully authenticated, by the Aggregation Proxy, the ISC XDMS(s) receive the request over the XDM-4i interface from the XDM proxies (Aggregation Proxy).

B3) The ISC XDMS(s) acknowledge the data update request of the index document with a HTTP “200 OK” reply, assuming that the ISC Client (XDM Client) had the right Access Permissions to perform the update operation and the operation was successful.

B4) The HTTP “200 OK” message is received by the ISC Client (XDM Client).

**Operation C: Document data retrieval from ISC XDMS(s)**

C1) The ISC Client through XDM Client sends a HTTP GET request over the XDM-3i interface, via the Aggregation Proxy to retrieve information from the ISC User Preferences Application Usage.

C2) Assuming that the ISC Client (XDM Client) was successfully authenticated, the ISC XDMS(s) receive the request over the XDM-4i interface from the XDM proxies (Aggregation Proxy)

C3) The ISC XDMS(s) returns the data in the body of an HTTP “200 OK” reply, assuming that the ISC Client (XDM Client) had the right Access Permissions to perform the retrieval operation and the operation was successful.

C4) The HTTP “200 OK” message is received by ISC Client (XDM Client).

**Operation D: Document data deletion from ISC XDMS(s)**

D1) The ISC Client through XDM Client sends a HTTP DELETE request over the XDM-3i interface, via the Aggregation Proxy/Aggregation Proxy to delete information from the ISC User Preference Application Usage.

D2) Assuming that the ISC Client (XDM Client) was successfully authenticated, the ISC XDMS(s) receive the delete request over the XDM-4i interface from the XDM proxies (Aggregation Proxy)

D3) The ISC XDMS(s), after checking the Access Permissions of the ISC Client (XDM Client), perform the deletion and acknowledges it by returning the body of an HTTP “200 OK” reply.

D4) The HTTP “200 OK” message is received by ISC Client (XDM Client).

**Operation E: Document data search from ISC XDMS(s)**

E1) The ISC Client through XDM Client sends a search request over the XDM -5i interface, via the Aggregation Proxy using Limited XQuery to search information stored in any ISC XML documents.

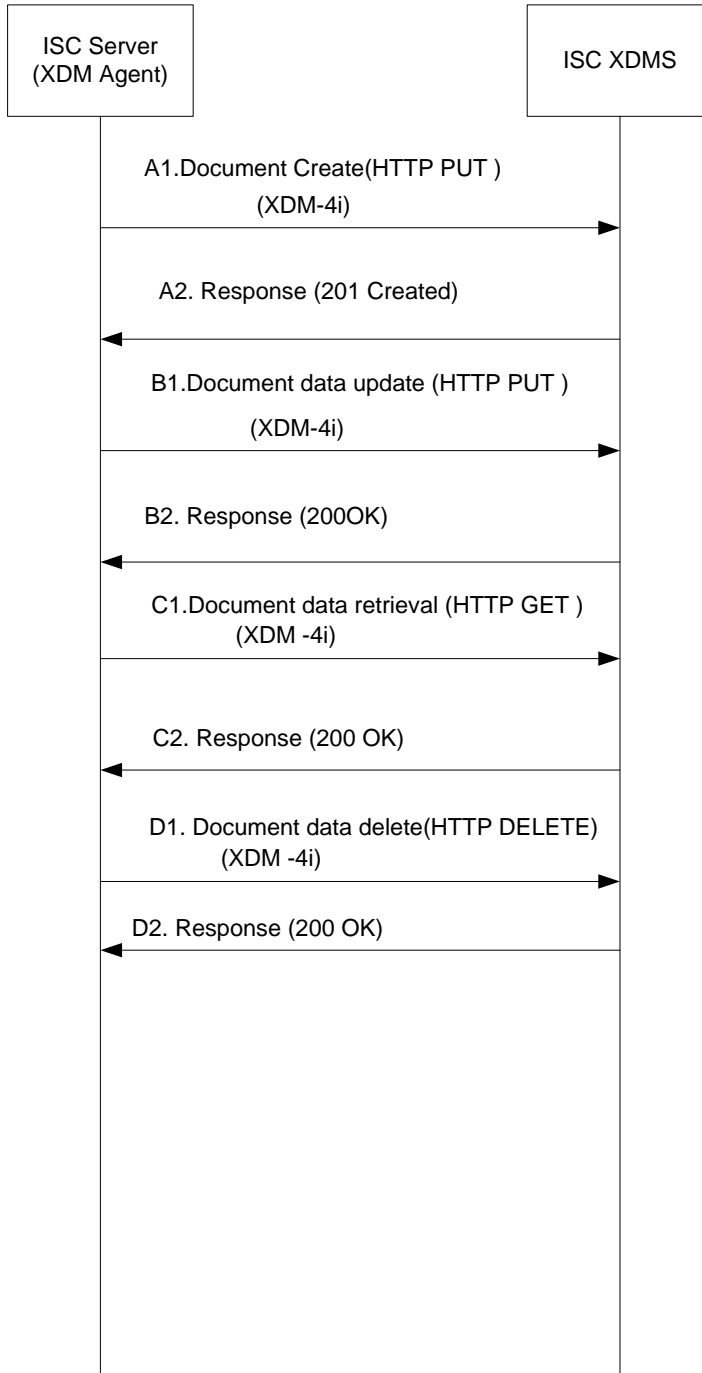
E2) After receiving the search request from ISC Client (XDM Client) over XDM -5i, the Aggregation Proxy route the request to Search Proxy .The ISC XDMS(s) receive the search request over XDM-7i interface from Search Proxy.

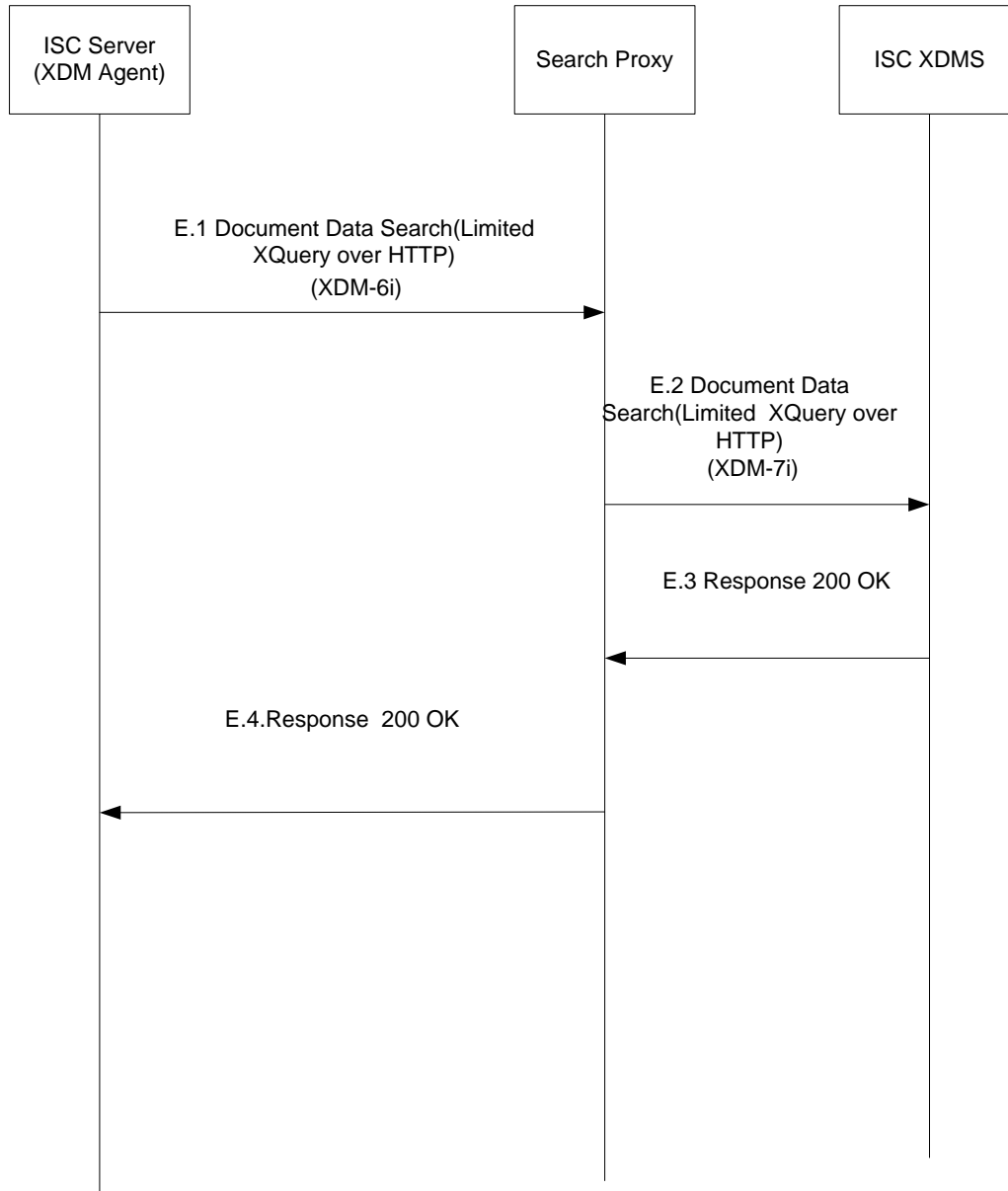
E3) The ISC XDMS(s) returns the data in the body of a HTTP”200” OK reply to the Search Proxy assuming that the ISC Client (XDM Client) had the right Access Permissions to perform the search operation and the operation was successful.

E4) the HTTP “200 OK” message is received by ISC Client (XDM Client).

### C.13.2 Management of ISC XML Documents by ISC Server

In ISC Enabler, an ISC Server through XDM Agent interacts with ISC XDMS via the interface XDM-4i to manage (e.g. retrieve, create, modify, delete) the ISC XML documents and via the interface XDM-6i to search document data exiting in the ISC XML documents





**Figure 8: Management of ISC XML Documents by ISC Server**

**Operation A: Creation of a document in ISC XDMS(s).**

A1) The ISC Server through XDM Agent sends an HTTP PUT request using the XDM-4i interface, to create a new ISC XML document “index” for a user in any of the ISC XDMS(s).

A2)The ISC XDMS(s) acknowledge the creation of index document with a HTTP “201 Created ”message ,assuming that ISC Server(XDM Agent) had the right Access Permissions to perform the create operation and the operation was successful.

**Operation B: Document data update in ISC XDMS(s)**

B1) The ISC Server through XDM Agent sends a HTTP PUT request over the XDM-4i interface to update the just-created “index” document.

B2) The ISC XDMS(s) acknowledge the data update request of the index document with a HTTP “200 OK” reply, assuming that the ISC Server (XDM Agent ) had the right Access Permissions to perform the update operation and the operation was successful.

**Operation C: Document data retrieval from ISC XDMS(s)**

C1) The ISC Server through XDM Agent sends a HTTP GET request over the XDM-4i interface, to retrieve information from the ISC User Preferences Application Usage

C2) The ISC XDMS(s) returns the data in the body of an HTTP “200 OK” reply, assuming that the ISC Server (XDM Agent) had the right Access Permissions to perform the retrieval operation and the operation was successful.

**Operation D: Document data deletion from ISC XDMS(s)**

D1) The ISC Server through XDM Agent sends a HTTP DELETE request over the XDM-4i interface, to delete information from the ISC User Preference Application Usage.

D2) The ISC XDMS(s), after checking the Access Permissions of the ISC Server (XDM Agent), perform the deletion and acknowledges it by returning the body of an HTTP “200 OK” reply.

**Operation E: Document data search from ISC XDMS(s)**

E1) The ISC Server through XDM Agent sends a search request over the XDM -6i interface, via the Search Proxy using Limited XQuery over HTTP to search information stored in any ISC XML documents.

E2) After receiving the search request from ISC Server (XDM Agent) over XDM -6i, the Search Proxy forwards the search request to a single or multiple instances of the ISC XDMS. The ISC XDMS(s) receive the search request over XDM-7i interface from the Search Proxy

E3) The ISC XDMS(s) returns the data in the body of a HTTP “200 OK” reply to the Search Proxy assuming that the ISC Server (XDM Agent) had the right Access Permissions to perform the search operation and the operation was successful.

E4) the HTTP “200 OK” message is received by ISC Server (XDM Agent).

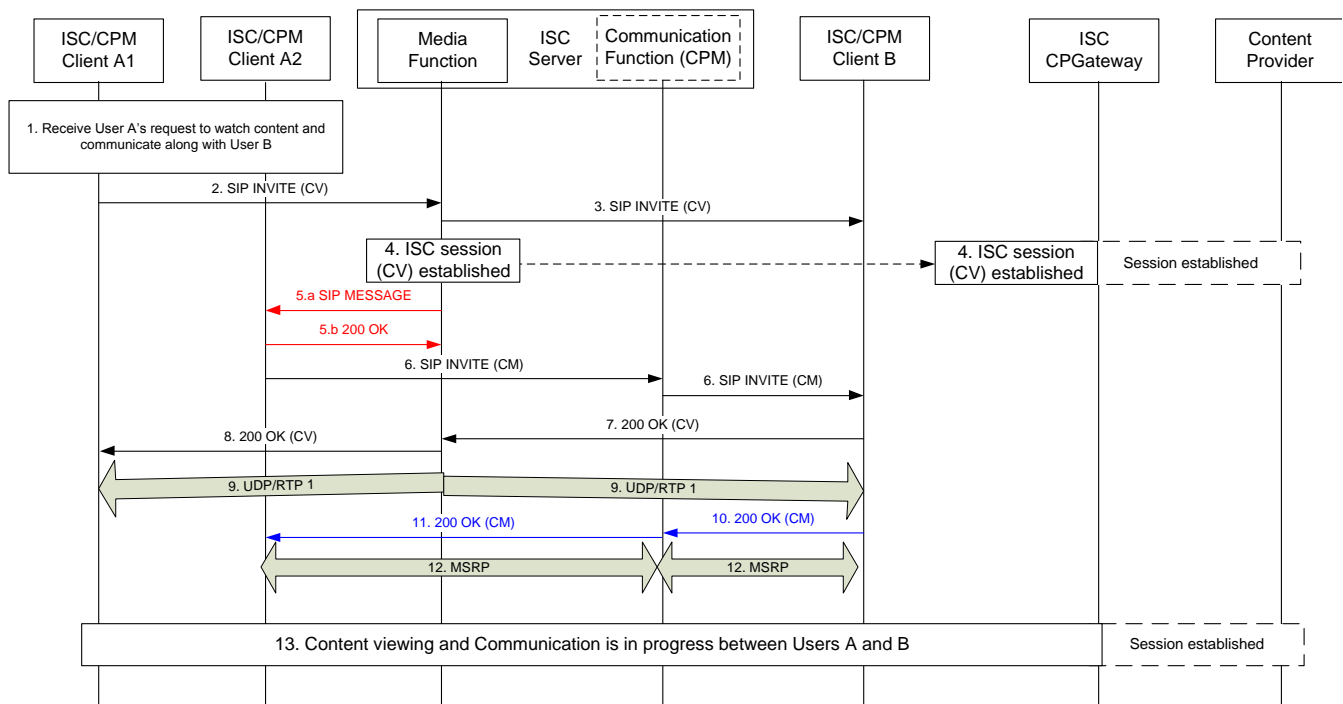
## C.14 Multi-device Supporting

### C.14.1 Content Viewing and Communication session when the initiator uses multiple devices

This section describes the case where an ISC User (User A) requests to watch content and communicate with another ISC User (User B), and the User A has multiple devices and sets one device to support communication and other device(s) to support content viewing.

The following is assumed:

- The ISC User A has two ISC devices, and sets one device (ISC/CPM Client A1) to playing the selected Content View, and set another device (ISC/CPM Client A2) to communication, via his/her user preference and/or the ISC User A's selection.



**Figure 9: Content Viewing and Communication when the initiator uses multiple devices**

1. Upon receiving the request from User A to watch content and communicate along with the User B, the ISC Client A1 gathers information related to the content from the Contents List, and the CPM Client A2 prepares the communication information.
2. The ISC Client A1 sends a request SIP INVITE for Content Viewing (CV) towards the ISC Server Media Function including:
  - the reference to content, and
  - information that there is an associated communication, and
  - the target User B, and
  - the communication information (e.g., the ISC/CPM Client ID which will initiate the communication with the User B).

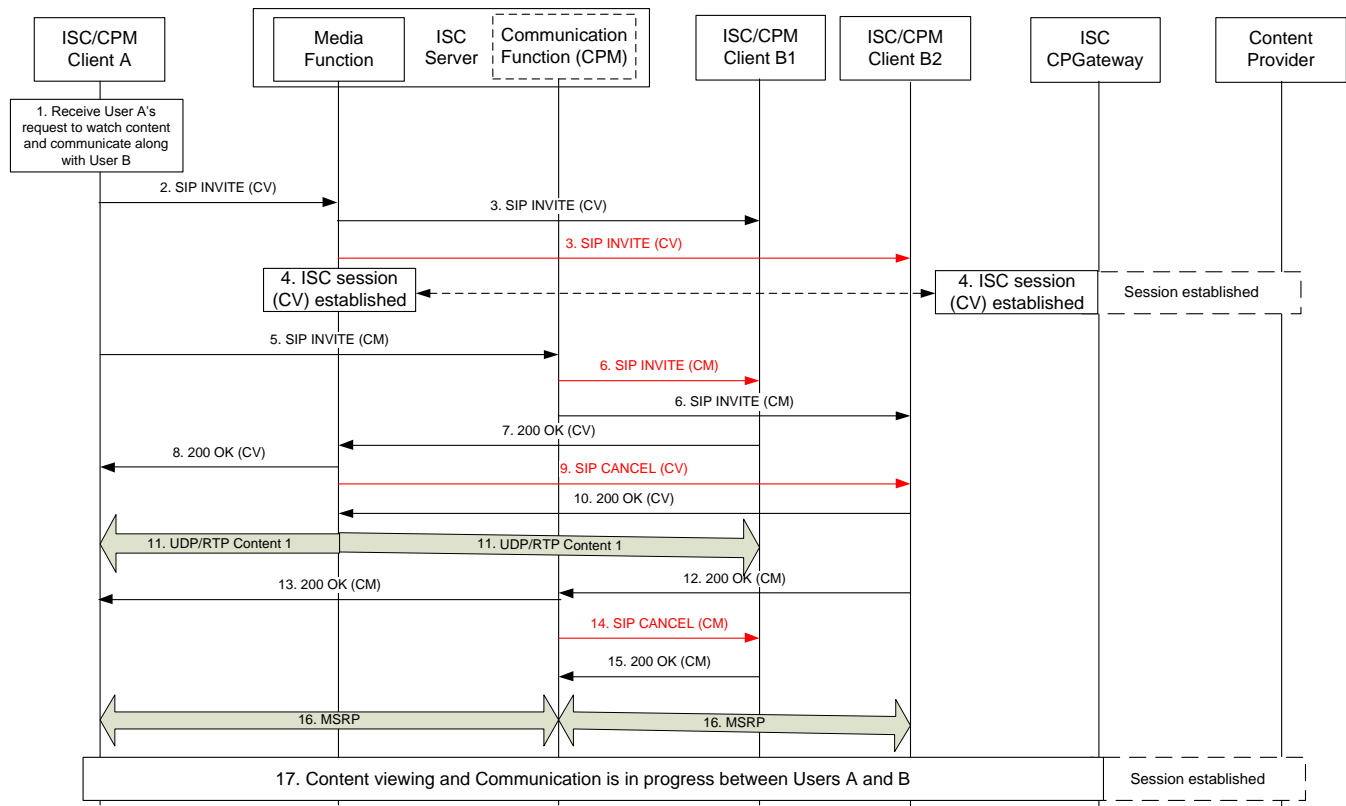


3. Then the ISC Server Media Function relays the SIP INVITE (CV) for content viewing towards the ISC Client B. The ISC Client B knows that the User A request is intended for both content viewing.
4. If an ISC session (CV) has not been established yet for the requested content, the ISC Server establishes an ISC session with the Content Provider through the ISC CP Gateway for receiving content.
- 5.a. If the ISC User A selects ISC/CPM Client A2 to support communication, the ISC Server Media Function sends SIP MESSAGE to the ISC/CPM Client A2, the invitation information includes the parameters to indicate how the ISC/CPM Client A2 establishes Communication Session with the ISC/Client B.
- 5.b. If the ISC/CPM Client A2 Accepts the invite, it responds SIP 200 "OK" to the ISC Server Media function.
6. Upon request from the ISC Client A2, the CPM Client A2 sends a request SIP INVITE (CM) towards the ISC Server Communication Function (CPM) including:
  - A. information that there is an associated content viewing, and
  - B. the target User B.
7. The ISC Server Communication Function (CPM) relays the SIP INVITE (CM) for setting up communication towards ISC Client B.
8. Upon receiving acceptance from the User B for content viewing, the ISC Client B sends back a response 200 OK (CV).
9. The ISC Server Media Function relays the SIP 200 (CV) response accepting to set up content viewing session.
10. UDP/RTP channel is setup by the ISC Server Media Function towards both the ISC Client A1 and the ISC Client B. The ISC Server Media Function then transmits the media related to the content requested in Step 2, over the UDP/RTP channel to the ISC Client A1 and the ISC Client B. User A and B are now watching the content.
11. Upon receiving acceptance from User B for communication, the ISC Client B sends back a response 200 OK (CM).
12. The ISC Server Communication Function relays the SIP 200 (CM) response accepting to set up communication session.
13. MSRP channel is setup by the ISC Server Communication Function towards both ISC Client A2 and ISC Client B for exchanging messages.
14. Users A and B are now watching the content together and communicating.

In this case, the content viewing session and communication session are initiated by different clients (devices), one is ISC/CPM Client A1, and another is ISC/CPM Client A2. And the ISC Server, according to the initiator's request and his/her user reference, cooperates the two sessions.

### C.14.2 Content Viewing and Communication session when the recipient using multi-devices

This section describes the case where an ISC User (User A) requests to watch content and communicate with another ISC User (User B) who has multiple devices and sets one device to support communication and other device(s) to support content viewing.



**Figure 10: Content Viewing and Communication when the recipient using multi-devices**

1. Upon receiving the request from ISC User A to watch content and communicate along with the User B, the ISC Client A gathers information related to the content from the Contents List.
2. The ISC Client A sends a request SIP INVITE for Content Viewing (CV) towards the ISC Server Media Function including:
  - A. the reference to content, and
  - B. information that there is an associated communication, and
  - C. the target ISC User B.
3. The ISC Server Media Function relays the SIP INVITE (CV) for content viewing towards the ISC Client B1 and B2. The ISC Client B1 and B2 knows that the User A’s request is intended for both content viewing.
4. If an ISC session (CV) has not been established yet for the requested content, the ISC Server establishes an ISC session with the Content Provider through the ISC CP Gateway for receiving content.
5. Upon request from the ISC Client A, the CPM Client A sends a request SIP INVITE (CM) towards the ISC Server Communication Function (CPM) including:
  - D. information that there is an associated content viewing, and
  - E. the target User B.

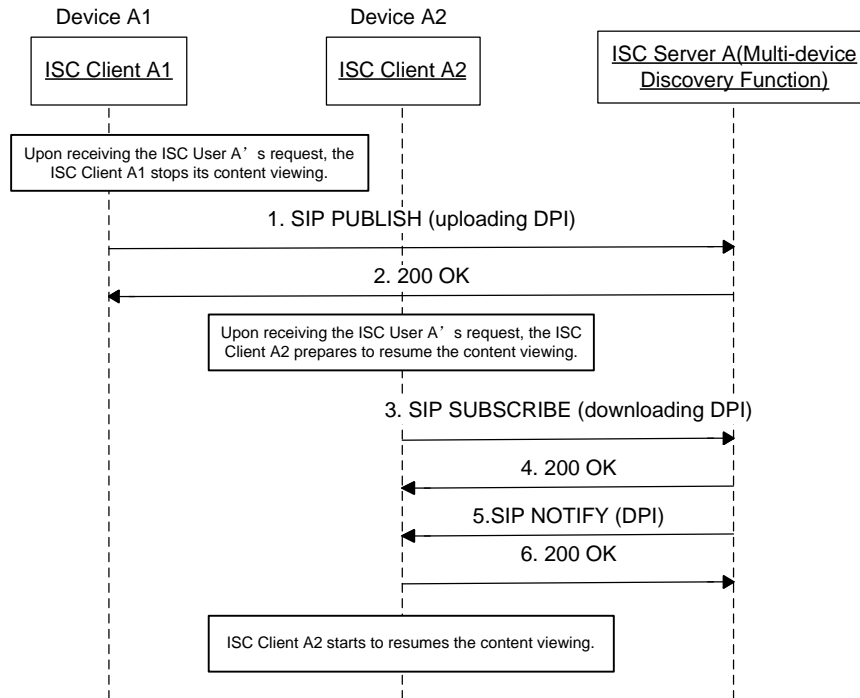
6. The ISC Server Communication Function (CPM) relays the SIP INVITE (CM) for setting up communication towards ISC Client B1 and B2.
7. Upon receiving acceptance from the User B for content viewing via the ISC Client B1, the ISC Client B1 sends back a response 200 OK (CV).
8. The ISC Server Media Function relays the SIP 200 (CV) response accepting to set up content viewing session.
9. The ISC Server Media Function sends a SIP CANCEL (CV) to the ISC/CPM Client B2 to cancel the ISC Session Invitation (CV) sent previously.
10. The ISC/CPM Client B2 sends back a 200 OK to accept the cancellation of the ISC Session Invitation (CV).
11. UDP/RTP channel is setup by the ISC Server Media Function towards both the ISC Client A and the ISC Client B1. The ISC Server Media Function then transmits the media related to the content requested in Step 2, over the UDP/RTP channel to the ISC Client A and the ISC Client B1. User A and B are now watching the content.
12. Upon receiving acceptance from User B for communication via the CPM Client B2, the CPM Client B2 sends back a response 200 OK (CM).
13. The ISC Server Communication Function relays the SIP 200 (CM) response accepting to set up communication session.
14. The ISC Server Communication Function sends a SIP CANCEL (CM) to the ISC/CPM Client B1 to cancel the ISC Session Invitation (CM) sent previously.
15. The ISC/CPM Client B1 sends back a 200 OK to accept the cancellation of the ISC Session Invitation (CM).
16. MSRP channel is setup by the ISC Server Communication Function towards both ISC Client A and ISC Client B2 for exchanging messages.
17. Users A and B are now watching the content together and communicating.

### C.14.3 Resuming a Stopped Content Viewing with any of the ISC User’s devices

This section describes the case where an ISC User uses any of his/her multiple devices to resume his/her Content Viewing, which is stopped or suspended by the ISC User.

The following is assumed:

- The ISC User has subscribed the service of storing the history of his/her Device Presence Information (including Content Viewing Information) in the network repository (ISC Server).



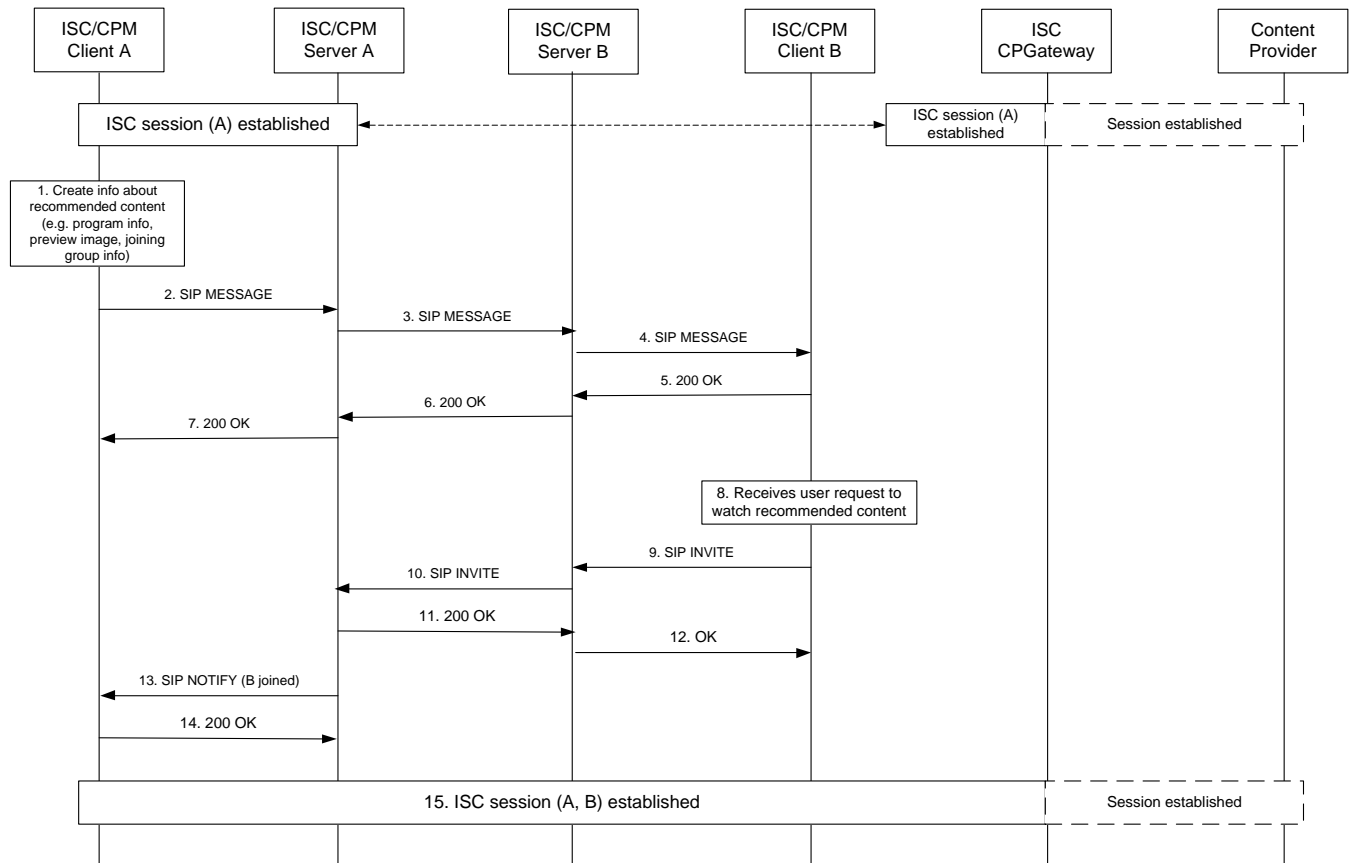
1. Upon receiving the ISC User A’s request, the ISC Client A1 stops its content viewing and uploads its Content Viewing Information to the ISC Server A’s Function. The ISC Client A1 sends SIP PUBLISH request to the ISC Server A’s Multi-device Discovery Function. The request includes its Content Viewing Information (CVI). And one of the parameter of the Content Viewing Information indicates it is the last record.
2. The ISC Server A’s Multi-device Discovery Function stores the Content Viewing Information and responds SIP 200 “OK” response.
3. Upon receiving the ISC User A’s request, the ISC Client A2 prepares to resume his/her content viewing ever in the Client A1, and sends SIP SUBSCRIBE request to download the stored Content Viewing Information as uploaded by the ISC Client A1.
4. The ISC Server A’s Multi-device Discovery Function responds SIP 200 “OK” to the ISC Client A2.
5. The ISC Server A’s Multi-device Discovery Function sends SIP NOTIFY notification to the ISC Client A2, the notification includes the history of the Content Viewing Information as stored in the ISC Server A.
6. The ISC Client A2 stores the Content Viewing Information and responds SIP 200 “OK” to the ISC Server A.

When the ISC Client A2 receives the history of Content Viewing Information as uploaded by the ISC Client A1, it parses the end time point of the content viewing in the Content Viewing Information, and starts to continue the content viewing from the end time point.

## C.15 Recommending a Content to another ISC User

This section describes the case where an ISC User recommends a content to another ISC User and suggests to watch it together. The following are assumed:

- ISC Client A has already established an ISC session with the Content Provider where the recommended content can be watched;
- ISC Client A is subscribed to a conference event package associated with the ISC session in order to receive related event notifications, following the rules and procedures of [RFC4575].



1. ISC/CPM Client A creates information about the content to recommend (e.g. information about the program, preview image of the program, information about how to join the Content Viewing Group)

2-4. ISC/CPM Client A includes information about the recommended content in a message (SIP MESSAGE) and sends it towards CPM Server A. CPM Server A relays the message to CPM Server B, which relays it to ISC/CPM Client B.

5-7. ISC/CPM Client B sends back a response (200 OK) towards CPM Server B to confirm the reception of the recommendation message towards CPM Server B. CPM Server B relays the response to CPM Server A, which relays it to ISC/CPM Client A.

8-10. When ISC Client B receives a request from the receiving ISC User to watch the recommended content, ISC Client B sends a request (SIP INVITE) towards ISC Server B to join the ISC content viewing session established by ISC Client A, where the recommended content can be viewed. ISC Server B relays the request to ISC Server A.

11-12. ISC Server A sends back a response (200 OK) towards ISC Server B to accept the request from ISC Client B. ISC Server B relays the response to ISC Client B.

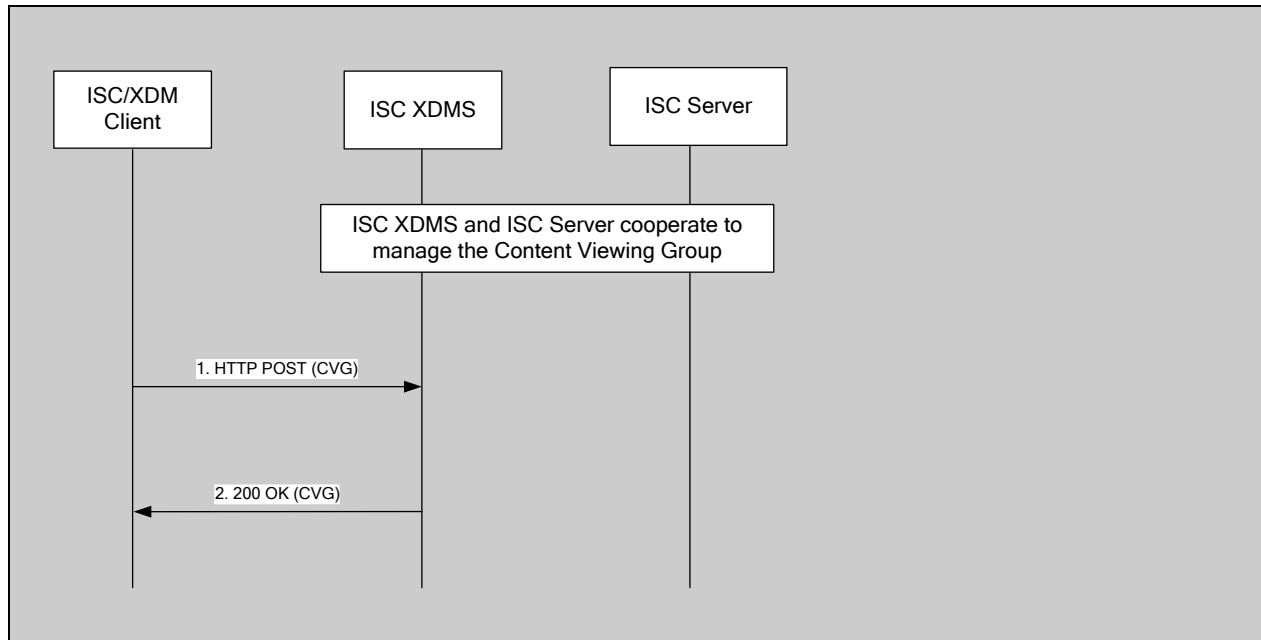
13. ISC Server A notifies (SIP NOTIFY) ISC Client A that ISC Client B joined the Content Viewing Group.

14. ISC Client A sends back a response (200 OK) to ISC Server A to confirm the reception of the notification.
15. ISC Client A and ISC Client B are in the same ISC session and can watch the recommended content together.

## C.16 User and Group Searching

### C.16.1 Searching Active Content Viewing Group according to Content View

This section describes the case where an ISC User requests to search for active Content Viewing Group(s).



**Figure 11: Searching for active Content Viewing Group**

1. Upon receiving the request from User to search for active Content Viewing Group (CVG), the ISC Client gathers criteria related to the content being viewed, such as the content name, content identifier, pre-defined keyword and composes related XQuery expression. The ISC Client sends HTTP POST request to the ISC Group Application Usages of ISC XDMS as defined in [OMA-TS-ISC-XDMS] to the ISC XDMS via XDM Client, the request includes the XQuery expression.
2. The ISC XDMS accepts the request and responds a HTTP 200 “OK” to the ISC Client via XDM Client, and the response contains the searched result.

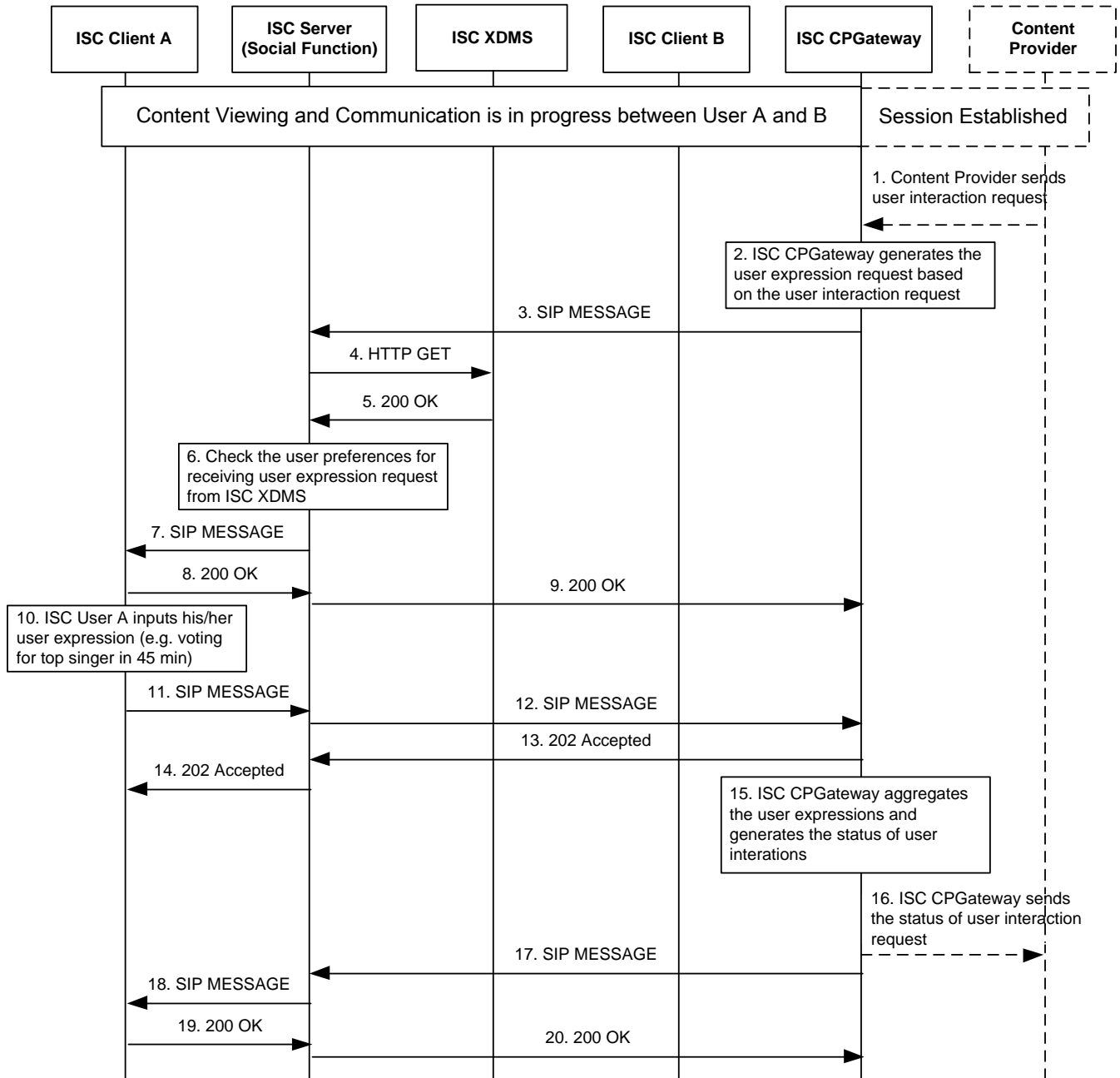
## C.17 Receiving Full Contents List from CP

### C.17.1 Contents List structure

For Contents List XML Schema, refer to Appendix C.1 Contents List XML Document Structure as specified in [OMA-ISC-XDMS-TS]

## C.18 User Interaction

This section describes social interaction between the ISC User and the Content Provider.



**Figure 12: Social Interaction between the ISC User and the Content Provider**

While ISC User A and ISC User B is in progress on Contact Viewing and Communication via the Content Provider,

1. The Content Provider sends the user interaction request for social interaction between the ISC User an the Content Provider to the ISC CPGateway.
2. The ISC CPGateway generates the user expression request based n the user interaction request.
3. The ISC CPGatway sends the user expression request (SIP MESSAGE) to the ISC Server.
4. The ISC Server retrieves the ISC User Preferences Document from the ISC XDMS.
5. The ISC Server receives 200 OK from the ISC XDMS.



6. The ISC Server checks the ISC Users' preferences whether or not ISC Users receives the user expression request from the ISC Content Provider.
7. The ISC Server sends the user expression request (SIP MESSAGE) to the ISC Client
8. The ISC Server receives 200 OK from the ISC Client.
9. The ISC Server sends 200 OK to ISC CPGateway.
10. The ISC User inputs his/her user expression. (e.g. voting for top singer in 45 min)
11. The ISC Client sends user expression response message (SIP MESSAGE) to the ISC Server which includes the information for responding to the user expression
12. The ISC Server forwards the user expression response message to the ISC CPGateway.(SIP MESSAGE)
13. The ISC Server receives the acknowledgement from the ISC CPGateway.(202 Accepted)
14. The ISC Server forwards the acknowledgement to the ISC Client. (202 Accepted)
15. The ISC CPGateway aggregates the received user experiences and generates the status of user interactions.
16. The ISC CPGateway sends the status of user interaction request.
17. The ISC CPGateway sends the status of user expression response based upon the user preferences to the ISC Server. (SIP MESSAGE)
18. The ISC Server forwards the status of user expression response (SIP MESSAGE) to the ISC Client.
19. The ISC Client A sends the acknowledgement towards ISC CPGateway. (200 OK)
20. The ISC Server A forwards the acknowledgement to ISC CP Gateway. (200 OK)

## C.19 Set the Social Relationship

This section describes social relationship between the ISC Users.

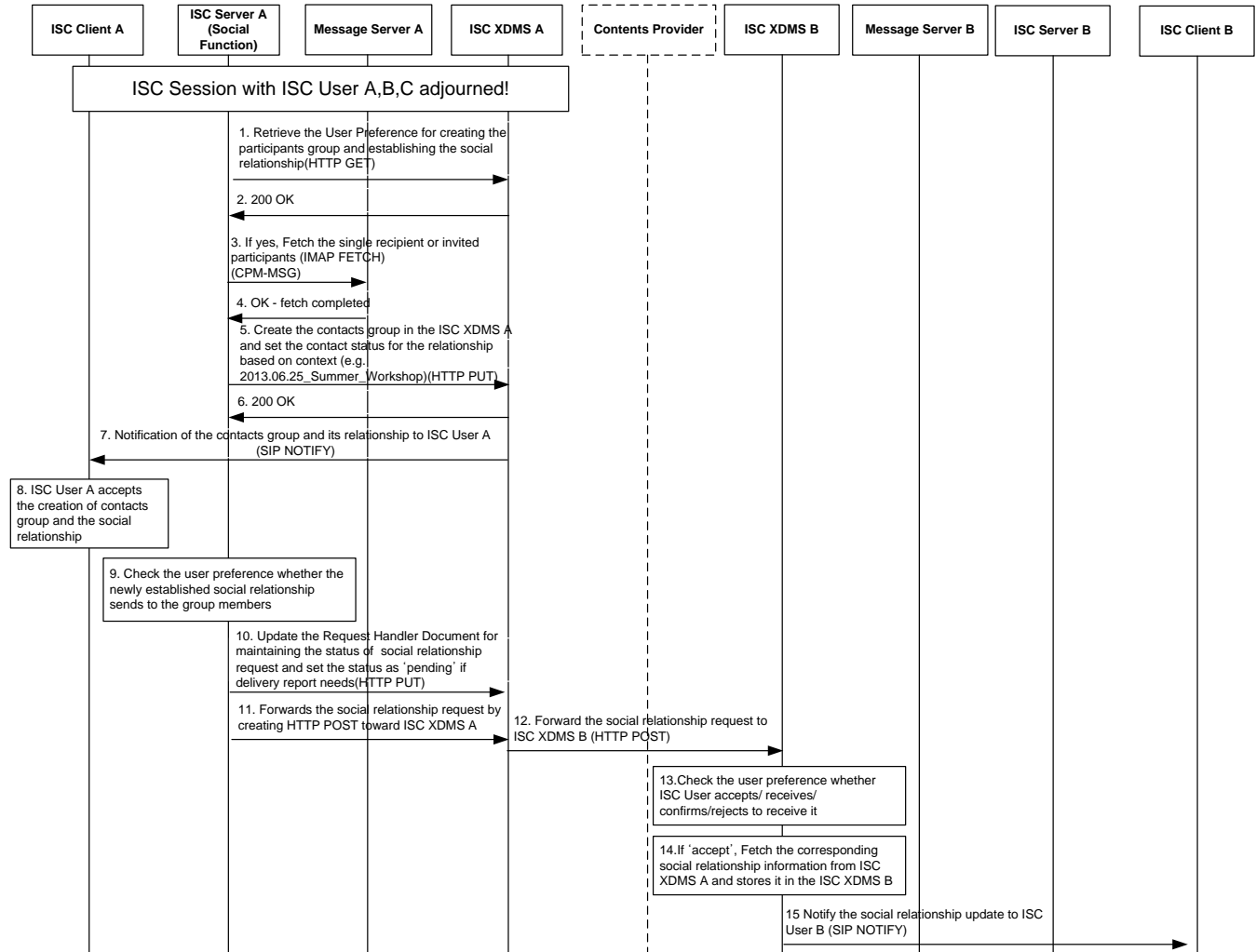


Figure 13: Social Relationship between the ISC Users

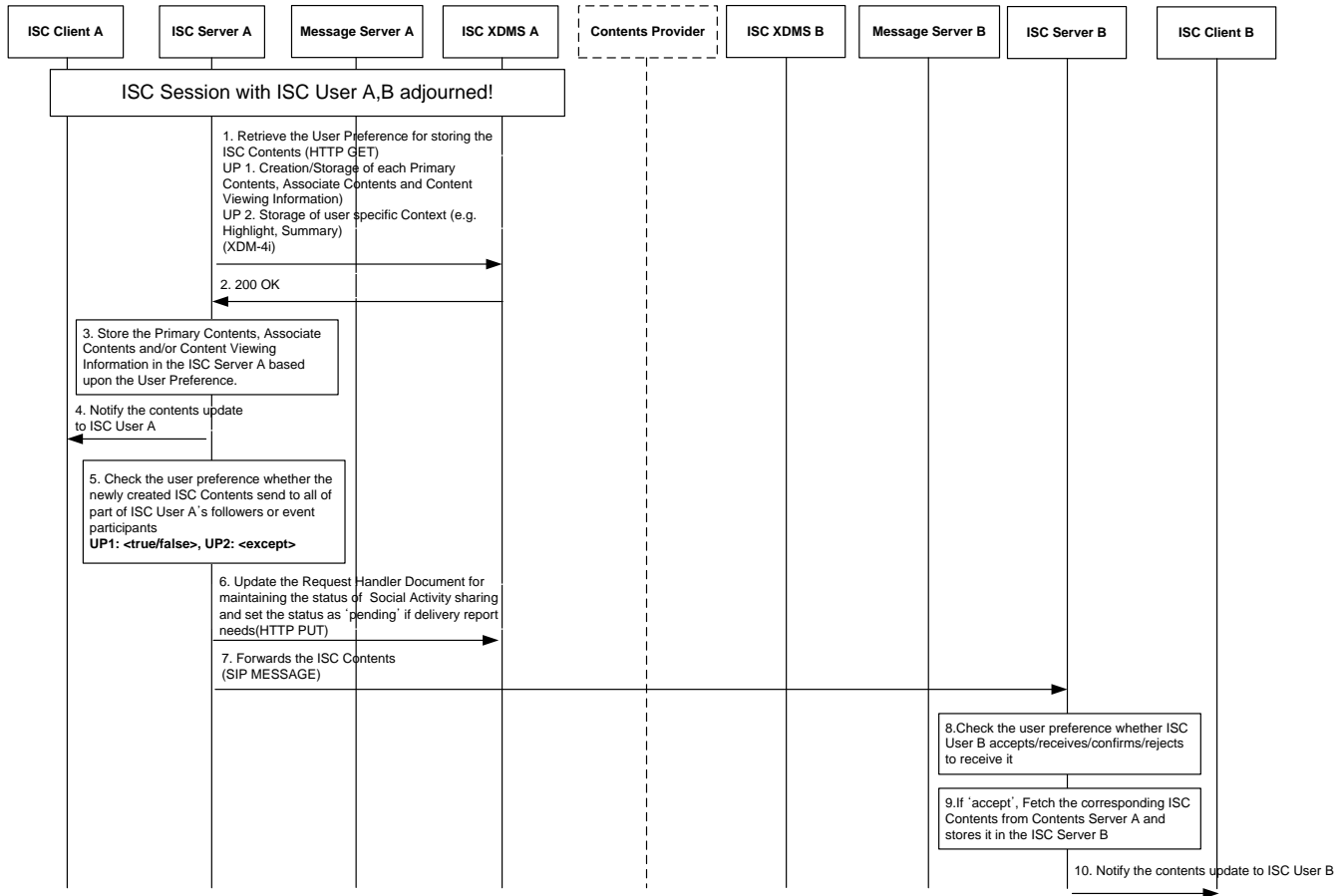
After ISC User A and ISC User B had a Contact Viewing and Communication via the Content Provider,

1. The ISC Server A retrieves the ISC User Preference for creating the participants group and establishing the social relationship by using HTTP GET
2. The ISC Server A receives 200 OK from the ISC XDMS A.
3. Base on the ISC User Preferences for creating the contacts group and the, the ISC Server A fetches the single recipient or invited participants (IMAP FETCH) through the CPM-MSG interface.
4. The ISC Server A receives OK - fetch completed.
5. The ISC Server A creates the contacts group in the ISC XDMS A and set the social relationship for each contact in the contacts group based on context (e.g. 2013.06.25\_Summer Workshop)(HTTP PUT)
6. The ISC Server A receives 200 OK from the ISC XDMS A.
7. The ISC User A is notified of the contacts group and its relationship to ISC User A. (SIP NOTIFY)
8. The ISC User A accepts the creation of contacts group and the social relationship.

9. The ISC Server A checks the user preference whether the newly established social relationship sends to the contacts group members
10. The ISC Server A updates the Request Handler Document for maintaining the status of social relationship request and set the status as 'pending' if the delivery report needs(HTTP PUT)
11. The ISC Server A generates the social relationship request by creating HTTP POST toward ISC XDMS A
12. The ISC XDMS A forwards the social relationship request to ISC XDMS B. (HTTP POST)
13. The ISC XDMS B checks the user preference whether ISC User B accepts/ receives/ confirms/rejects to receive it
14. Based on the user preference, (accept), the ISC XDMS B fetches the corresponding social relationship information from ISC XDMS A and stores it in the ISC XDMS B
15. The ISC Client B is notified of the social relationship update to ISC User B. (SIP NOTIFY)

## C.20 Share the Social Activity

This section describes social activity Sharing between the ISC Users.



**Figure 14: Social Activity sharing between the ISC Users**

After ISC User A and ISC User B is in progress on Contact Viewing and Communication via the Content Provider,

1. The ISC Server A retrieves Retrieve the User Preference for storing the ISC Contents (HTTP GET) User Pref.1 to store each Primary Contents, Associate Contents and Content Viewing Information User Pref.2 to store the ISC Contents based on user specific context (e.g. Highlight, Summary)
2. The ISC Server A receives 200 OK from the ISC XDMS A.
3. ISC Serve A stores the Primary Contents, Associate Contents and/or Content Viewing Information in the ISC Server A based upon the User Preference.
4. The ISC User A is notified the contents update to ISC User A. (SIP NOTIFY)
5. The ISC Server A checks the user preference whether the newly created ISC Contents send to all of part of ISC User A's followers or event participants
6. The ISC Server A updates the Request Handler Document for maintaining the status of Social Activity sharing and set the status as 'pending' if delivery report needs(HTTP PUT)
7. The ISC Server A forwards the ISC Contents (SIP MESSAGE)

8. The ISC XDMS B checks the user preference whether ISC User B accepts/ receives/ confirms/rejects to receive it
9. Based on the user preference, (accept), the ISC XDMS B fetches the corresponding ISC Contents from Contents Server A and stores it in the ISC Server (SIP MESSAGE)
10. The ISC Client B is notified the contents update to ISC User A. (SIP NOTIFY).

## C.21 Associated Contents Viewing

### C.21.1 Deliver Associated Contents to the same device

This section describes the case where an ISC User A requests to deliver video-based Associated Contents to the same device while the Primary Content is being viewed.

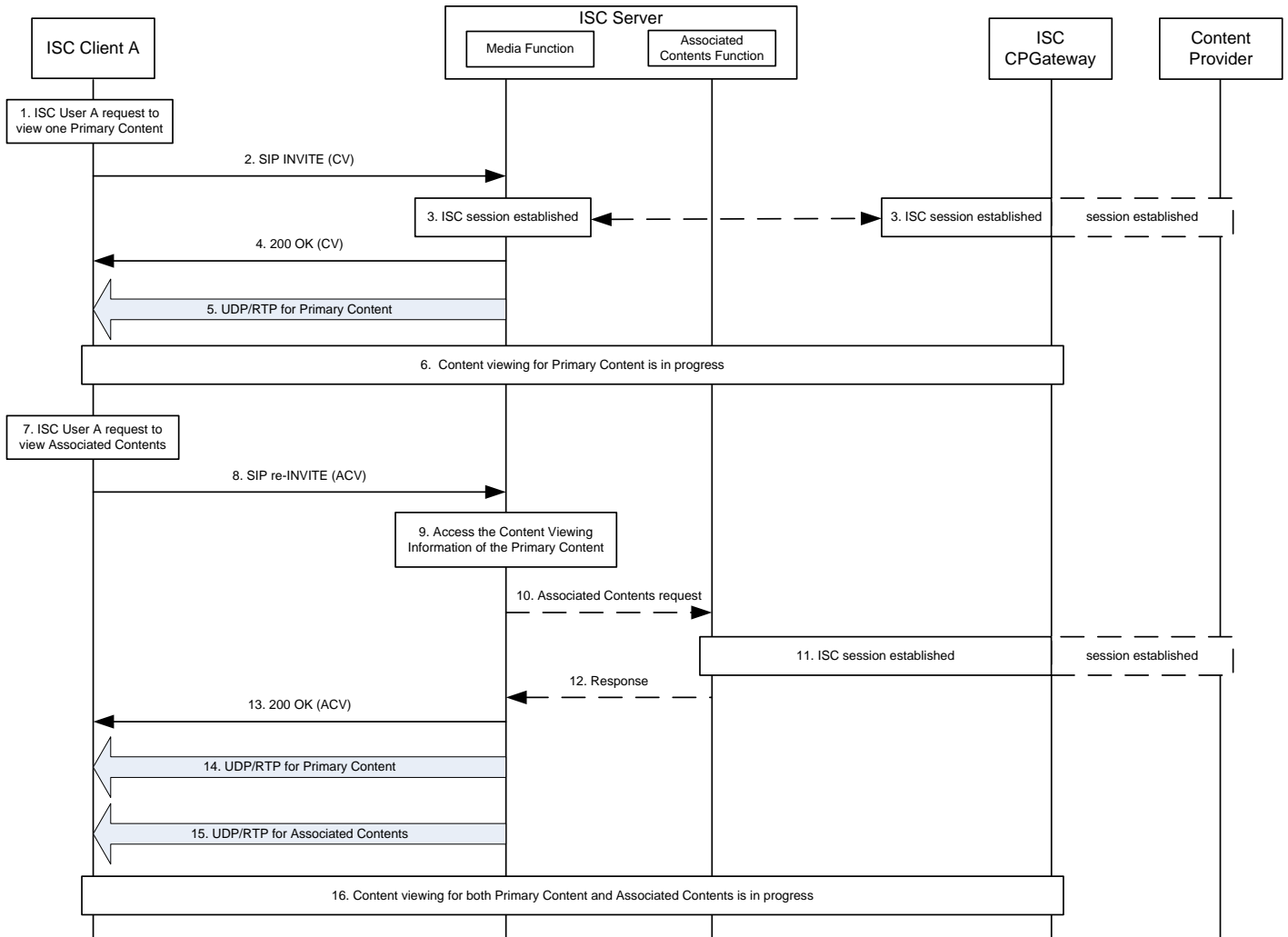


Figure 15: X.Y.1

1. ISC User A selects one specific Primary Content (e.g. TV program) and request to watch.
2. ISC Client A sends a request (SIP INVITE) for content viewing (CV) towards the ISC Server (Media Function) including the reference to the Primary Content
3. If an ISC session has not been established yet for the requested Primary Content, ISC Server (Media Function) establishes an ISC session with the Content Provider through the ISC CP Gateway for receiving content.
4. ISC Server (Media Function) sends back a response (200 OK) accepting to process the request and setting up UDP/RTP channel.
5. ISC Server (Media Function) then transmits the media related to the Primary Content requested in Step.2 over the UDP/RTP channel to the ISC Client A.

6. ISC User A is now watching the Primary Content.
7. After a while, ISC User A request to view video-based Associated Contents (e.g. sign language video content in a PIP fashion), ISC Client A gathers information related to the viewing Primary Content.
8. ISC Client A sends a request (SIP re-INVITE) for video-based Associated Contents viewing towards the ISC Server (Media Function) including the Content Viewing Information of Primary Content.
9. ISC Server (Media Function) access the Content Viewing Information (e.g., content metadata and viewing progress) of the Primary Content.
- 10-12. ISC Server (Media Function) request to fetch Associated Content based on the collected Content Viewing Information of Primary Content.If an ISC session has not been established yet for the requested Associated Content, ISC Server (video-based Associated Contents Function) establishes an ISC session with the Content Provider through the ISC CP Gateway for receiving content.
13. ISC Server (Media Function) sends back a response (200 OK) accepting to process the request.
14. ISC Server (Media Function) continues transmitting the media related to the Primary Content requested in Step.2 over the UDP/RTP channel to the ISC Client A.
15. ISC Server (Media Function) then transmits the media related to the video-based Associated Contents requested in Step. 8 over the existing UDP/RTP channel to the ISC Client A.
16. ISC User A is now viewing both Primary Content and video-based Associated Contents.

### C.21.2 Deliver Associated Contents to a secondary device

This section describes the case where an ISC User A requests to deliver video-based Associated Contents to a secondary device while the Primary Content is being viewed.

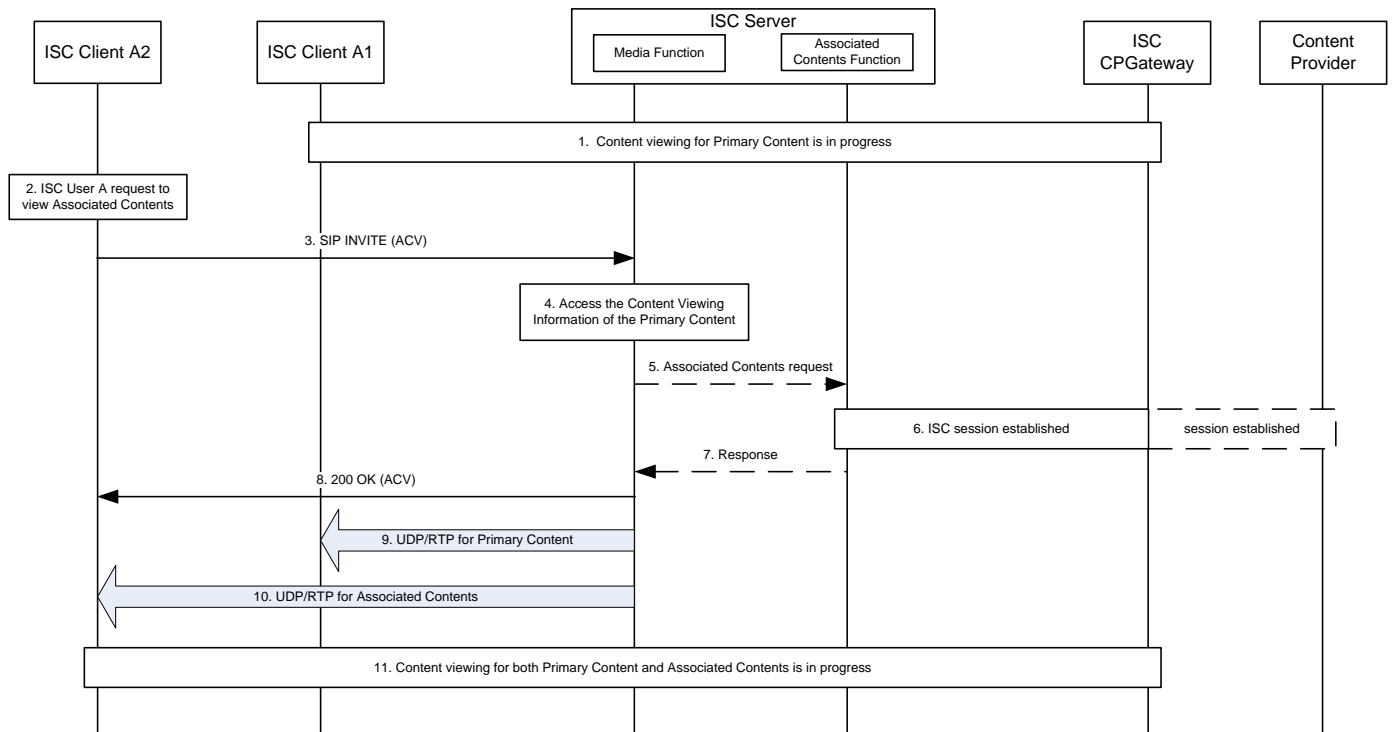


Figure 16: X.Y.2

1. The following is assumed:
  - ISC Client A1 has already established an ISC session for the Content Viewing of Primary Content as shown in Figure. X.Y.1 (Step.1 to 6);
2. ISC User A request to view video-based Associated Contents (e.g. sign language video content in a PIP fashion), ISC Client A2 gathers information related to the viewing Primary Content.
3. ISC Client A2 sends a request (SIP INVITE) for video-based Associated Contents viewing towards the ISC Server (Media Function) including the Content Viewing Information of Primary Content.
4. ISC Server (Media Function) access the Content Viewing Information (e.g., content metadata and viewing progress) of the Primary Content.
- 5-7. ISC Server (Media Function) request to fetch Associated Content based on the collected Content Viewing Information of Primary Content.If an ISC session has not been established yet for the requested Associated Content, ISC Server (video-based Associated Contents Function) establishes an ISC session with the Content Provider through the ISC CP Gateway for receiving content.
8. ISC Server (Media Function) sends back a response (200 OK) accepting to process the request.
9. ISC Server (Media Function) continues transmitting the media related to the Primary Content over the UDP/RTP channel to the ISC Client A1.
10. ISC Server (Media Function) then transmits the media related to the video-based Associated Contents requested in Step. 3 over the existing UDP/RTP channel to the ISC Client A2.
11. ISC User A is now viewing both Primary Content and video-based Associated Contents.



## C.22 Receiving Associated Contents List

This section describes the case where an ISC User requests to receive Associated Contents List document from the CP via ISC CP Gateway.

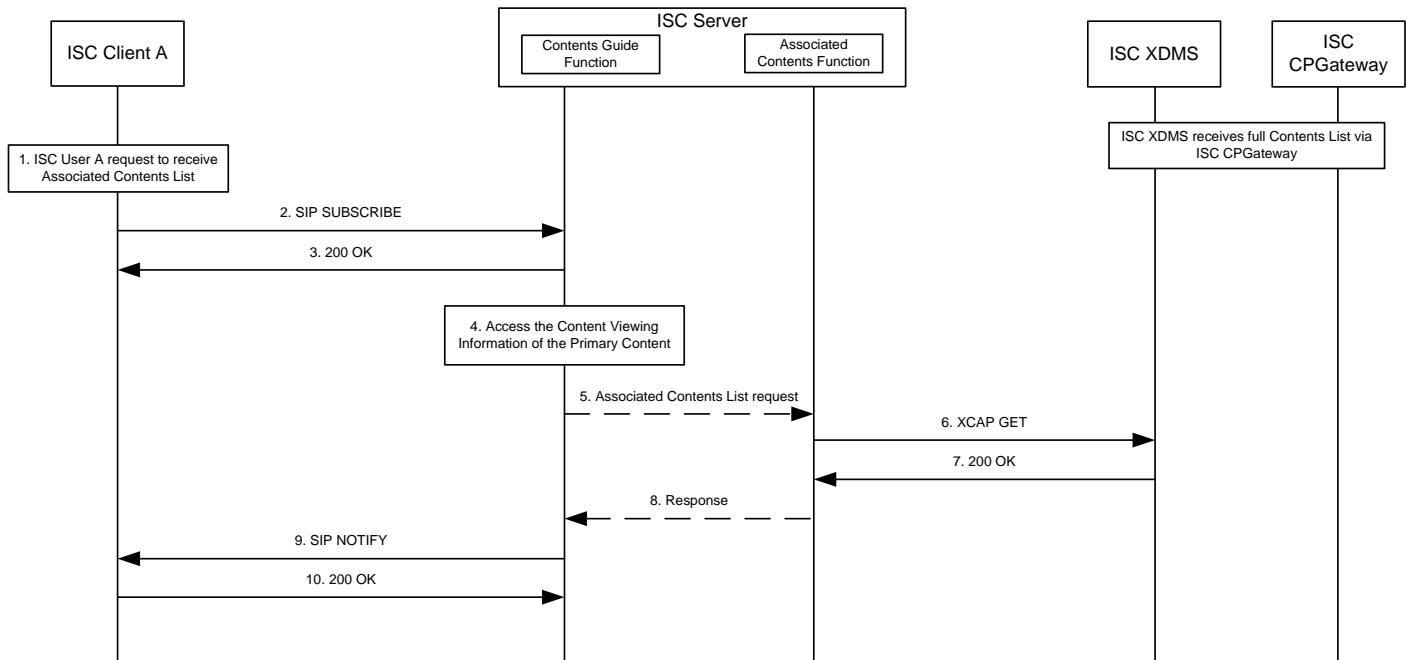


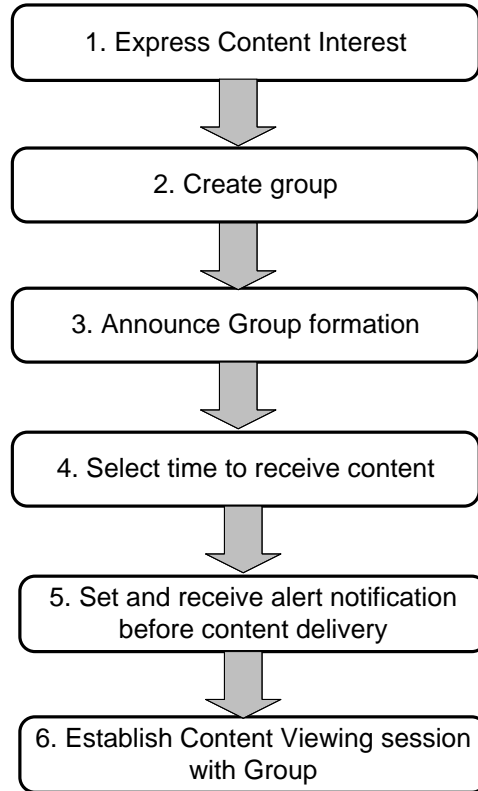
Figure 17: X.Y.1

The following is assumed:

- ISC XDMS has already received Associated Contents List from the ISC CP GATEWAY. It is also assumed that ISC XDMS has subscribed for receiving the updates in Associated Contents List
1. ISC User A request to receive Associated Contents List document.
  2. ISC Client A sends a request (SIP SUBSCRIBE) including Content Viewing Information to the ISC Server (Content Guide Function) which is generated:
    - a. with expires = 0 in header to receive the Associated Contents List document only once, according to the rules and procedures described in [RFC6665]
  3. ISC Server (Content Guide Function) acknowledges with a 200 OK response towards the ISC Client A.
  4. ISC Server (Content Guide Function) access the Content Viewing Information (e.g., content metadata and viewing progress) of the Primary Content.
  5. ISC Server (Content Guide Function) requests to fetch Associated Content List based on the collected Content Viewing Information of Primary Content.
  6. - 8. ISC Server (Associated Contents Function) sends an XCAP GET request to ISC XDMS to receive the Associated Contents List document. The ISC XDMS acknowledges with a 200 OK response including the Associated Contents List document.
  7. ISC Server (Content Guide Function) generates a SIP NOTIFY including the Associated Contents List towards the ISC Client A. If the SIP SUBSCRIBE request in Step.2 is for receiving continuous updates, then ISC Server (Content Guide Function) generates SIP NOTIFY every time there is an update to Associated Contents List.
  8. ISC Client A acknowledges with a 200 OK response towards the ISC Server (Content Guide Function).

## Appendix D. Scenario for Expressing Content Interest (Informative)

This section describes the scenario where an ISC User expresses interest to watch content and then those interested users watch the content as a content viewing group at pre-determined time.



**Figure 18: Content Interest Scenario Flow**

1. User A sends request about his/her interest in viewing a particular content to potential user(s) including
  - Content metadata
  - Expiry time

The ISC Server relays User A's content interest to the target user(s) and waits for their consent. ISC Server responds back to User A with the user(s) giving consent to view content together.

**Note: the corresponding flow is in Section C.12.1 "Content Interest – Express Content Interest"**

2. User A sends a request to ISC Server to create a group with the list of users shown interest to view content together
3. The ISC Server sends group creation information message to the members of the group after the group is created.

**Note: the corresponding flow is in Section 12 "Content Interest – announcing group creation"**

4. User A sends a request towards the ISC Server to setup a communication session with the group members. Group members exchange messages in the communication session and decide on the convenient time to watch the content.
5. Users request to set an alert before receiving the content. The ISC Server sends alert notification to the members in the group before the content delivery.

Note: the corresponding flow is in Section 5 “Content Interest – receive alert notification before content delivery”

6. Content Viewing Group session is established with the group members for viewing the content.

## Appendix E. ISC Charging Principles and Scenarios (informative)

The OMA charging model states that its “Charging Enabler” facilitates interaction between various OMA service enablers and the charging functional entity (either offline, online or both), which may reside in various domains, e.g., 3GPP/3GPP2 Service Provider [OMA-Charging]. As an external entity residing in the operator's domain this charging entity takes various roles, which service providers need to perform the charging activities.

ISC charging is based on the concept of charging for usage of the service. ISC charging shall support two charging models, Event-based charging and session-based charging.

- Session-based charging used when there is a need to maintain a session for all through the service. Typically, there are at least two requests to the billing system.
  - Initial request—used for signaling the beginning of the activities .This request type contains the data related to the session used by the user.
  - Intermediary request—used for updating the current session (for example, adding video to a voice call).This request is, of course, optional.
  - Final request—used for closing a session.
- Event-based charging, charging for session unrelated events.

### E.1 Charging Principles for ISC Events

The OMA Charging Enabler User shall use Event-based charging to enable charging for the following session unrelated procedures refers to the corresponding charging scenarios:

- Request and receive information about another ISC User’s context.
- Receive suggestions of other ISC Users and /or suggestions of contents from the service provider
- Retrieval of the list of contents
- Retrieval of associated content
- Retrieval of one or all deferred contents/information.
- Having all deferred content/information pushed

### E.2 Charging Principles for ISC Sessions

Charging requests for an ISC session shall be generated by the ISC Server for the ISC User being served by it.

The charged parties may be any of the ISC participants, depending on the role of the participant. These roles are:

- ISC participant.
- ISC inviting user or group owner (in the case of Content Viewing Group)

Information about the session supported by the ISC Enabler shall be collected by the ISC Server.

ISC session owner and/or participants may be charged based on, e.g.:

1. session duration,
2. Number of participants,
3. Volume of messages sent and/or received by the participant to/from the content provider,

4. Number of messages sent and/or received by the participant to/from the content provider,

Or a combination of the above.

## Appendix F. Parameters to be provisioned the ISC-based Service (Normative)

Parameters to be provisioned for ISC can be found in [OMA-TS-ISC-MO].

## Appendix G. 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 ISC Client, the ISC Server and the ISC CP Gateway.

The ISC Client, the ISC Server and the ISC CP Gateway SHALL implement the user-agent and server headers, according to the rules and procedures of [RFC3261] with the clarifications in this sub-clause specific for ISC.

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 = ISC-product / token [SLASH product-version]
product-version = token
```

### G.1 ISC 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:

```
ISC-product = "ISC-" isc-device-token (SLASH isc-product-version)
ISC-device-token = "client" | "serv" | "gateway" token
ISC-product-version = "OMA1.0"
```

Example 1:

In this example ISC Client acting as UAC and the ISC Server acting as UAS are OMA ISC release version 1.0 products. The ISC Client has inserted its own company and product name and version "Arena-Messaging1000/v1.01".

User-Agent: ISC-client/OMA1.0 Arena-Messaging1000/v1.01

Server: ISC-serv/OMA1.0

Example 2:

In this example both the ISC Server acting as UAC and the ISC Client acting as UAS are OMA ISC release version 1.0 products.

User-Agent: ISC-serv/OMA1.0

Server: ISC-client/OMA1.0

## Appendix H. ISC-defined SIP Header fields

### H.1 Header field Definitions

#### H.1.1 ISCConvergenceID

A ISCConvergenceID header field in a SIP MESSAGE request or SIP INVITE request is a globally unique identifier that indicates the ISC request and response associated with a ISC Content Viewing and Communication, Content Interest.

All requests and responses belonging to the same ISC Content Viewing and Communication or the same Content Interest will carry the same value for the ISCConvergenceID header field.

A sending ISC functional component MUST include a ISCConvergenceID header field in each SIP MESSAGE request or SIP INVITE request that are associated with a ISC Content Viewing and Communication, Content Interest. The sending ISC functional component MUST ensure that the included ISCConvergenceID is globally unique. A ISCConvergenceID SHALL be a universally unique identifier, as specified in [RFC4122]. Following the conventions in [RFC4122], ISCConvergenceIDs are case-insensitive.

Examples:

```
ISCConvergenceID: f81d4fae-7dec-11d0-a765-00a0c91e6bf6
```

### H.2 ABNF for the ISC-defined SIP Headers

```
ISC-Headers = (ISCConvergenceID) CRLF
```

```
ISCConvergenceID = "ISCConvergenceID" HCOLON ISCConvergenceID
```

```
ISCConvergenceID = word
```

NOTE 1: The tokens "CRLF", "HCOLON" and "word" are defined in [RFC3261].



## Appendix I. ISC Feature Tags (NORMATIVE)

This Appendix describes the ISC Feature identifiers used in this Technical Specification.

### I.1 ISC Feature Identifiers

The ISC 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. ISC Feature identifiers are carried in feature tags as described in section I.3 “Proposed Formats for ISC Feature Identifiers”.

The ISC Enabler needs several identifiers in order to identify the signalling related to the ISC Enabler as it is processed by the ISC Client and the SIP/IP core as well as by the ISC Server-side components and to identify all the different features supported by the ISC Enabler.

The ISC Feature identifiers identify which ISC Feature the ISC Client is using or willing to use.

If the SIP/IP core corresponds to 3GPP/3GPP2 IMS, the ISC 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.

The ISC Enabler SHALL reuse the Supporting Enabler (e.g., CPM) ICSI, if the ISC Client(s) request SHOULD be processed by the Supporting Enabler Server components. Otherwise, SHALL include the common ISC ICSI in the ISC Client’s request which is processed by the ISC Server.

### I.2 ISC Client Behaviour

The ISC Client SHALL identify all the ISC Features it supports and the ISC-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 ISC Client SHALL also identify the particular ISC Feature as well as any ISC-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 ISC Client SHALL identify the particular ISC Feature it is using when it issues specific SIP requests by including the particular ISC Feature in the **P-Preferred-Service header** as described in [3GPP TS 24.229].

The ISC Client SHALL include both ICSI and IARI feature tag in the **Accept-Contact header**, **Contact header** and **P-Preferred-Service header** as per [RFC3841], [RFC3840], if the ISC Server has to behave differently when it receives IARI, else the ISC Client SHALL include only ICSI feature tag in the request.

### I.3 Proposed Formats for ISC 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 ISC Feature identifier SHALL be set to:

1. +g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.oma.isc.<isc-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.isc.<isc-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 ISC Features identifiers be used as when the SIP/IP core corresponds to 3GPP/3GPP2 IMS in order to facilitate interoperability.

The ISC Feature identifier carried as a feature tag SHALL be used by ISC server-side and client-side components, as specified in the procedures in this document.

The ISC Feature identifier carried as a URN in a P-Preferred-Service header SHALL be used by ISC Clients and carried as a URN in a P-Asserted-Service header SHALL be used by ISC server-side and client-side components, as specified in the procedures in this document, when the SIP/IP core corresponds to 3GPP/3GPP2 IMS.

The <isc-feature> value in the ISC Feature identifier further identifies the ISC Feature being invoked as described in Table 1 below.

14. Features	15. Format and values for Accept-Contact and Contact	16. Format and values for P-Preferred-Service and P-Asserted-Service
ISC Content Viewing and Communication Integrated Session	+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.icsi.oma.isc.cv-cm"	urn:urn-7:3gpp-service.ims.icsi.oma.isc.cv-cm
Request for Contents List	+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.iari.oma.isc.contentslist"	urn:urn-7:3gpp-service.ims.iari.oma.isc.contentslist
Expressing Content Interest	+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.iari.oma.isc.contentinterest"	urn:urn-7:3gpp-service.ims.iari.oma.isc.contentinterest
Self Content Viewing session	+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.iari.oma.isc.self-cv"	urn:urn-7:3gpp-service.ims.iari.oma.isc.self-cv
1-1 Content Viewing and Communication session	+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.iari.oma.isc.1-1-cv-cm"	urn:urn-7:3gpp-service.ims.iari.oma.isc.1-1-cv-cm
Group Content Viewing and Communication session	+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.iari.oma.isc.group-cv-cm"	urn:urn-7:3gpp-service.ims.iari.oma.isc.group-cv-cm
Immersive Content Viewing session	+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.iari.oma.isc.icv-session"	urn:urn-7:3gpp-service.ims.iari.oma.isc.icv-session
Associated Contents Viewing session	+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.iari.oma.isc.acv-session"	urn:urn-7:3gpp-service.ims.iari.oma.isc.acv-session
Multi-device handling for Content Viewing and Communication session	+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.iari.oma.isc.cm.recommendation"  g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.iari.oma.isc.cv.cancellation"  g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.iari.oma.isc.cm.cancellation"	urn:urn-7:3gpp-service.ims.iari.oma.isc.cm.recommendation  urn:urn-7:3gpp-service.ims.iari.oma.isc.cv.cancellation  urn:urn-7:3gpp-service.ims.iari.oma.isc.cm.cancellation
Content Usage Rights Delegation and Content Recommendation	+g.3gpp.icsi-ref="urn%3Aurn-7%3A3gpp-service.ims.iari.oma.isc.social"	urn:urn-7:3gpp-service.ims.iari.oma.isc.social

**Table 1: Formats for ISC Feature identifiers**

## Appendix J. User Interaction MIME

### J.1 Structure

The MIME for the user interaction with the top-level Content-Type header field 'application/vnd.oma.isc.userinteraction+xml' SHALL be set to 'text/xml'. This sub-level MIME body SHALL contain one root element <user-interaction> that SHALL include:

1. One <user-expression-request-set> element;
  - A. MAY include one or more <user-expression-request> elements which contains in details of each ISC User expression request between the ISC User and ISC Content Provider. The <user-expression-request> element
    - i. SHALL include an 'id' attribute that uniquely identifies the user expression request.
    - ii. SHALL include an <items> element, containing a set of item for user expression request.
      1. <item> sub-element(s) indicating an item of user expression request. Each <item> element SHALL include an 'id' attribute to identify each item and MAY include a 'url' attribute to provide the URL information of the item.
    - iii. MAY include a <description> element, containing a description for the user expression request.
    - iv. SHALL include a <participation> element to indicate a way for participation of user expression.
      1. <comm.-addr> sub-element(s) indicating a communication address for the user expression
    - v. MAY include a <expired-time> element, including a expiry time of user expression request
2. One <user-expression-response-set> element;
  - A. MAY include one or more <user-expression-response> elements which contains in details of each ISC User expression response between the ISC User and ISC Content Provider. The <user-expression-response> element
    - i. SHALL include an 'id' attribute that uniquely identifies the user expression response.
    - ii. SHALL include an <items> element, containing a set of item for user expression response.
      1. <item> sub-element indicating an item of user expression response. Each <item> element SHALL include an 'id' attribute to identify each item and a 'url' attribute to provide the URL information of the item.
    - iii. MAY include a <note> element, containing a user wanted text message for the user expression response.
    - iv. MAY include a <status-report> element, indicating whether the ISC User responding a user expression request wants to receive status report of user interaction request from the CPGateway. The <status-report> SHALL contain one of the following values;
      1. "true" - if the ISC User responding an user expression wants to receive the status report from the CPGateway.
      2. "false" - if the ISC User responding an user expression does not want to receive the status report from the CPGateway. This is the default value taken in the absence of <status-report> element.

## Appendix K. Contents MIME

### K.1 Content Interest Structure

The MIME for the Content Interest with the top-level Content-Type header field 'application/vnd.oma.isc.contents-alert+xml' SHALL be set to 'text/xml'. The sub-level MIME body SHALL contain the root element <ContentInterest> that SHALL include:

The <ContentInterest> element:

1. SHALL contain a <ContentRef> element uniquely identifies the Content among the Service Providers. SIP URI can be set as the value for ContentRef for the VOD Content and Channel Number can be set as the value for the LIVE Content;
2. MAY include a <ContentName> element representing the name of the Content.
3. MAY contain a <Description> element representing the description of the Content;
4. MAY contain a <UserMessage> element containing the message to the other ISC Users about ISC User's expressed Content interest;
5. MAY contain a <UserSetExpiryTime> element containing the time within which the other ISC Users response is expected for the ISC User's expressed Content interest;
6. MAY include a <UserID> element, containing:
  - a. a mandatory <UserInterest> element with the value set to either "yes" or "no";
7. SHALL include a <ContentDeliveryInfo> element, containing:
  - a. a mandatory <StartTime> element to decide the time to watch content;
  - b. a mandatory <ReminderTime> element to decide on reminder time for receiving the alert notification prior to content delivery;