ETSI TS 102 901 V5.1.1 (2013-10)

Core Network and Interoperability Testing (INT);
IMS NNI Interoperability Test Specifications;
IMS NNI interoperability test descriptions for RCS
(3GPP Release 10)

Reference
RTS/INT-00086

Keywords
IMS, interoperability, NNI, RCS, testing

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Sous-Préfecture de Grasse (06) N° 7803/88

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee IMS Network Testing (INT).

1 Scope

The present document specifies interoperability Test Descriptions (TDs) for Inter-IMS Network to Network Interface (II-NNI) interoperability testing for the Rich Communication Suite (RCS) related services based on RCS V5.1 Advanced Communications Services and Client Specification [12] and the related endorsement documents [13], [14] , [15], [16] and [17]. The Stage 3 Session Initiation Protocol (SIP) and Session Description Protocol (SDP) standard, TS 124 229 [1] and Inter-IMS Network to Network Interface, TS 129 165 [6] *define the functionalities on which the RCS services are based. TDs have been specified on the basis of the Test Purposes (TPs) and Test Suite Structure (TSS) presented in* TS 186 011-1 [2]. TP fragments presented in the present document as part of TDs are defined using the TPLan notation of ES 202 553 [5]. TDs have been written based on the test specification framework described in TS 102 351 [3] and the interoperability testing methodology defined in TS 102 237-1 [4], i.e. interoperability testing with a conformance relation.

NOTE: Requirements pertaining to a UE or an AS implementation or IMS core network requirements that can only be observed at the interface between UE and IMS CN are explicitly not within the scope of the present document.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

2.1 Normative references

The following referenced documents are necessary for the application of the present document.

[1] ETSI TS 124 229 (V10.10.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3 (3GPP TS 24.229 V10.10.0 Release 10)".

[2] ETSI TS 186 011-1 (V5.1.1): "Core Network and Interoperability Testing (INT); IMS NNI Interoperability Test Specifications (3GPP Release 10); Part 1: Test Purposes for IMS NNI Interoperability".

[3] ETSI TS 102 351: "Methods for Testing and Specification (MTS); Internet Protocol Testing (IPT); IPv6 Testing: Methodology and Framework".

[4] ETSI TS 102 237-1: "Telecommunications and Internet Protocol Harmonization Over Networks (TIPHON) Release 4; Interoperability test methods and approaches; Part 1: Generic approach to interoperability testing".

[5] ETSI ES 202 553: "Methods for Testing and Specification (MTS); TPLan: A notation for expressing Test Purposes".

[6] ETSI TS 129 165 (V10.10.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Inter-IMS Network to Network Interface (NNI) (3GPP TS 29.165 V10.10.0 Release 10)".

[7] ETSI TS 186 011-2 (V5.1.1): "Core Network and Interoperability Testing (INT); IMS NNI Interoperability Test Specifications (3GPP Release 10); Part 2: Test Description for IMS NNI Interoperability".

[8] IETF RFC 4975: "The Message Session Relay Protocol (MSRP)".

[9] IETF RFC 4976: "Relay Extensions for the Message Session Relay Protocol (MSRP)".

[10] IETF RFC 6135: "An Alternative Connection Model for the Message Session Relay Protocol (MSRP)".

[11] IETF RFC 5547: "A Session Description Protocol (SDP) Offer/Answer Mechanism to Enable File Transfer".

[12] GSMA™ RCS V5.1: "Rich Communication Suite 5.1; Advanced Communications Services and Client Specification; Version 1.0; 13 August 2012".

NOTE: Available at: http://www.gsma.com/rcs/wp-content/uploads/2012/10/RCS5.1-UNI-V1.0.zip.

[13] GSMA™ RCS V5.1: "Rich Communication Suite 5.1; Endorsement of 3GPP TS 29.311 Service Level Interworking for Messaging Services; Version 1.0; 13 August 2012".

NOTE: Available at: http://www.gsma.com/rcs/wp-content/uploads/2012/10/RCS5.1-UNI-V1.0.zip.

[14] GSMA™ RCS V5.1: "Rich Communication Suite 5.1; Endorsement of OMA CPM 1.0 Message Storage; Version 1.0; 13 August 2012".

NOTE: Available at: http://www.gsma.com/rcs/wp-content/uploads/2012/10/RCS5.1-UNI-V1.0.zip.

[15] GSMA™ RCS V5.1: "Rich Communication Suite 5.1; Endorsement of OMA CPM 1.0 Interworking; Version 1.0; 13 August 2012".

NOTE: Available at: http://www.gsma.com/rcs/wp-content/uploads/2012/10/RCS5.1-UNI-V1.0.zip.

[16] GSMA™ RCS V5.1: "Rich Communication Suite 5.1; Endorsement of OMA CPM 1.0 Conversation Functions; Version 1.0; 13 August 2012".

NOTE: Available at: http://www.gsma.com/rcs/wp-content/uploads/2012/10/RCS5.1-UNI-V1.0.zip.

[17] GSMA™ RCS V5.1: "Rich Communication Suite 5.1; Endorsement of OMA SIP/SIMPLE IM 1.0; Version 1.0; 13 August 2012".

NOTE: Available at: http://www.gsma.com/rcs/wp-content/uploads/2012/10/RCS5.1-UNI-V1.0.zip.

[18] Void.

[19] ETSI TS 103 189: "IMS Network Testing (INT); Specification of end-to-end QoS assessment for VoLTE and RCS Interop Events or Plugtests".

2.2 Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

Not applicable.

3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

3GPP	3rd Generation Partnership Project
AS	(IMS) Application Server
CF	(Test) ConFiguration
CFW	Call FloW
CN	Core Network
CPIM	Common Presence & Instant Messaging (Protocol)
CPM	Converged IP Messaging

CSCF	Call Session Control Function
DNS	Domain Name System
FQDN	Full Qualified Domain Name
HSS	Home Subscriber Server
IBCF	Interconnection Border Control Gateway
II-NNI	Inter-IMS Network to Network Interface
IM	Instant Messaging
IMS	IP Multimedia Subsystem
IOI	Inter Operator Identifier
IP	Internet Protocol
ISC	IMS Service Control
LBS	Location Based Services
MRFC	Multimedia Resource Function Controller
MRFP	Multimedia Resource Function Processor
MSRP	Message Sending Relay Protocol
NNI	Network-to-Network Interface
P-CSCF	Proxy CSCF
PO	Point of Observation
PS	Presence Server
RCS	Rich Communication Suite
RLS	Resource List Server
S-CSCF	Serving CSCF
SDP	Session Description Protocol
SIP	Session Initiation Protocol
SUT	System Under Test
TD	Test Description
TP	Test Purpose
TPLan	Test Purpose Notation
TSS	Test Suite Structure
UC	Use Case
UE	User Equipment
URI	Uniform Record Identifier
XMDS	XML Document Management Server

4 IMS NNI Interoperability Test Specification

4.1 Introduction

The IMS NNI Interoperability Test Descriptions (TDs) defined in the following clauses are derived from the Test Purposes (TPs) specified in TS 186 011-1 [2]. The TDs cover the services as defined in the RCS V5.1 specification [12] and the related endorsement documents [13], [14], [15], [16] and [17].

4.2 Test Prerequisites

The test prerequisites as described in TS 186 011-2 [7], clause 4.2, apply.

4.3 Test Infrastructure

The test infrastructure as described in TS 186 011-2 [7], clause 4.3, applies with the following additions.

4.3.1 Core IMS Nodes

4.3.2 External IMS core Nodes

4.3.2.1 HSS

Table 1 of TS 186 011-2 [7], clause 4.3.1.5.2, has to be extended by the following users for RCS services.

Table 1: Additional HSS sample user profiles for RCS

Private Identity	Public Identity 1 (SIP URI)	Public Identity 2 (Tel URI)	Default Public Identity	Filter criteria
userPRES_priv	userPRES	na	1	contact Presence AS
userIM_priv	userIM	na	1	contact IM AS for Instant Messaging
userFT_priv	userFT	na	1	contact IM AS for File Transfer
userSHARE_priv	userSHARE	na	1	

4.3.2.2 Specific Application Servers for RCS

Interworking between external Application Servers (AS) and the IMS core is under the scope of the present document. The ISC interface between the S-CSCF and the AS is used as a Point of Observation (PO) for NNI interoperability tests.

4.3.2.2.1 Presence Server

The presence server is an optional AS that acts as an intermediate for the user to provide Social Presence information to other users and other users to subscribe or get Social Presence information of a certain user, i.e. Presentity.

4.3.2.2.2 IM Server

The IM server is an AS within the IMS architecture that provides the IM service for the subscribers. It is responsible for a set of functions such as the control of the session setup, the enforcement of policies related to incoming or outgoing IM, the provision of information related to group members. Optionally the IM server may support "store and forward" feature.

4.3.2.2.3 Node Configuration

The AS should be configured to support the pre-requisites outlined in TS 186 011-2 [7], clause 4.2. The test descriptions in the present document assume that an AS supports the use of the IM/chat service and the following optional services: Social Presence, RCS services during a call and File transfer (see RCS V5.1 descriptions in [12] and the related endorsement documents [13], [14], [15], [16] and [17]). In the case that an AS does not support one or more of these services, only a selected subset of the test descriptions in the present document should be used for IMS core network interoperability testing, i.e. test descriptions which do not contain any pass criteria related to these supplementary services.

4.3.3 Test Configurations

The test configurations as described in TS 186 011-2 [7] clause 4.3.4 apply. It should be mentioned that test configurations for roaming scenarios are considered as optional.

4.4 Use Cases

In addition to the Use Cases in the present clause the Use Cases as described in TS 186 011-2 [7], clause 4.4 apply. It should be mentioned that Use Cases for roaming scenarios are considered as optional.

4.4.1 Capability discovery

4.4.1.1 General description

According to the RCS V5.1 specification [12] the capability or service discovery mechanism as the main process for retrieving the subset RCS services available for other contacts is based on two methods:

- capability discovery process through OPTIONS message;
- capability discovery via presence.

Capability discovery process through OPTIONS message is the default mechanism in [12] and Use Cases are described in clauses 4.4.1.2 and 4.4.1.3.

The use of capability discovery via presence method assumes that user additionally subscribed to an optional Social Presence service. In this case capability discovery can be performed using Social Presence service procedures. Use Cases for Social Presence services including capability discovery issues are described in clause 4.4.2.

It should be mentioned that in both capability discovery methods UE A and UE B should be registered on corresponding IMS networks A and B depending on the test scenarios (interworking and roaming).

4.4.1.2 UC_RCS_1_I: SIP message flow for Capability discovery process through OPTIONS message with CF_INT_CALL

The test sequence typically associated with this use case is as follows (CFW step numbers refer the call flow step numbering).

Step	Action	CF_INT_CALL
1	User A selects a contact of user B in the phone address book	Step 1
2	User B is informed about user A capabilities	Step 7
3	User A is informed about user B capabilities	Step 13

The expected call flow sequence is:

Step	Direction	Message	Comment
	User A / UE A / IMS A / IBCF A / IBCF B / IMS B / UE B / User B		
1			User A selects a contact of user B in the phone address book
2	→	OPTIONS	UE_A sends OPTIONS to IMS_A with Accept-contact header containing user A capabilities (RCS services Tags(RCS services Tags)
3	→	OPTIONS	IMS_A forwards OPTIONS to IBCF_A
4	→	OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
5	→	OPTIONS	IBCF_B forwards OPTIONS to IMS_B
6	→	OPTIONS	IMS_B forwards OPTIONS to UE_B
7			User B is informed about user A capabilities
8	←	200 OK	UE_B responds with 200 OK to IMS_B with Contact header containing user B capabilities (RCS services Tags(RCS services Tags)
9	←	200 OK	IMS_B forwards 200 OK to IBCF_B
10	←	200 OK	IBCF_B forwards 200 OK to IBCF_A

Step	Direction								Message	Comment
	User A	UE A	IMS A	IBCF A	IBCF B	IMS B	UE B	User B		
11			←						200 OK	IBCF_A forwards 200 OK to IMS_A
12		←							200 OK	IMS_A forwards 200 OK to UE_A
13										User A is informed about user B capabilities

4.4.1.3 UC_RCS_1_R: SIP message flow for Capability discovery process through OPTIONS message with CF_ROAM_CALL

The test sequence typically associated with this use case is as follows (CFW step numbers refer the call flow step numbering).

Step	Action	CF_ROAM_CALL
1	User A selects a contact of user B in the phone address book	Step 1
2	User B is informed about user A capabilities	Step 10
3	User A is informed about user B capabilities	Step 19

The expected call flow sequence is:

Step	Direction								Message	Comment
	User A	UE A	IMS A	IBCF A	IBCF B	IMS B	UE B	User B		
1										User A selects a contact of user B in the phone address book
2		→							OPTIONS	UE_A sends OPTIONS to IMS_A with Accept-contact header containing user A capabilities (RCS services Tags(RCS services Tags)
3			→						OPTIONS	IMS_A forwards OPTIONS to IBCF_A
4				→					OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
5					→				OPTIONS	IBCF_B forwards OPTIONS to IMS_B
6					←				OPTIONS	IMS_B forwards OPTIONS to IBCF_B
7				←					OPTIONS	IBCF_B forwards OPTIONS to IBCF_A
8			←						OPTIONS	IBCF_A forwards OPTIONS to IMS_A
9			→	→	→	→			OPTIONS	IMS_A forwards OPTIONS to UE_B
10										User B is informed about user A capabilities
11			←			←			200 OK	UE_B responds with 200 OK to IMS_A with Contact header containing user B capabilities (RCS services Tags(RCS services Tags)
12			→						200 OK	IMS_A forwards 200 OK to IBCF_A
13				→					200 OK	IBCF_A forwards 200 OK to IBCF_B
14					→				200 OK	IBCF_B forwards 200 OK to IMS_B
15					←				200 OK	IMS_B forwards 200 OK to IBCF_B

Step	Direction								Message	Comment
	User A	UEA	IMSA	IBCFA	IBCFB	IMSB	UEB	User B		
16				←					200 OK	IBCF_B forwards 200 OK to IBCF_A
17				←					200 OK	IBCF_A forwards 200 OK to IMS_A
18			←						200 OK	IMS_A forwards 200 OK to UE_A
19		←								User A is informed about user B capabilities

4.4.2 Social Presence service

4.4.2.1 General description

According to RCS specification [12] the Social Presence service is assumed to be optional.

If the Social Presence service is implemented on the network there could be also provided the capability discovery mechanism via presence as mentioned in the clause 4.4.1. In all Social Presence service Use Cases provided below the capability discovery issues are considered.

The list of Use Cases for Social Presence service include:

- Watcher subscription to presence event notification
- Watcher subscription to resource list

All of the Use Cases for Social Presence service in the present document include procedures of one user authorizing another user to see its Social Presence information.

4.4.2.2 Watcher subscription to presence event notification

4.4.2.2.1 Description

UE_B publishes its presence information and subscribes to receive notifications with watcher information. UE_A subscribes to presence information state changes of UE_B. This test requires the use of application server in IMS_B (Presence Server). The call flow path and node configuration for this use case corresponds to CF_INT_AS in case of interworking and CF_ROAM_AS in case of roaming.

The test sequence typically associated with this use case is as follows (CFW step numbers refer the call flow step numbering):

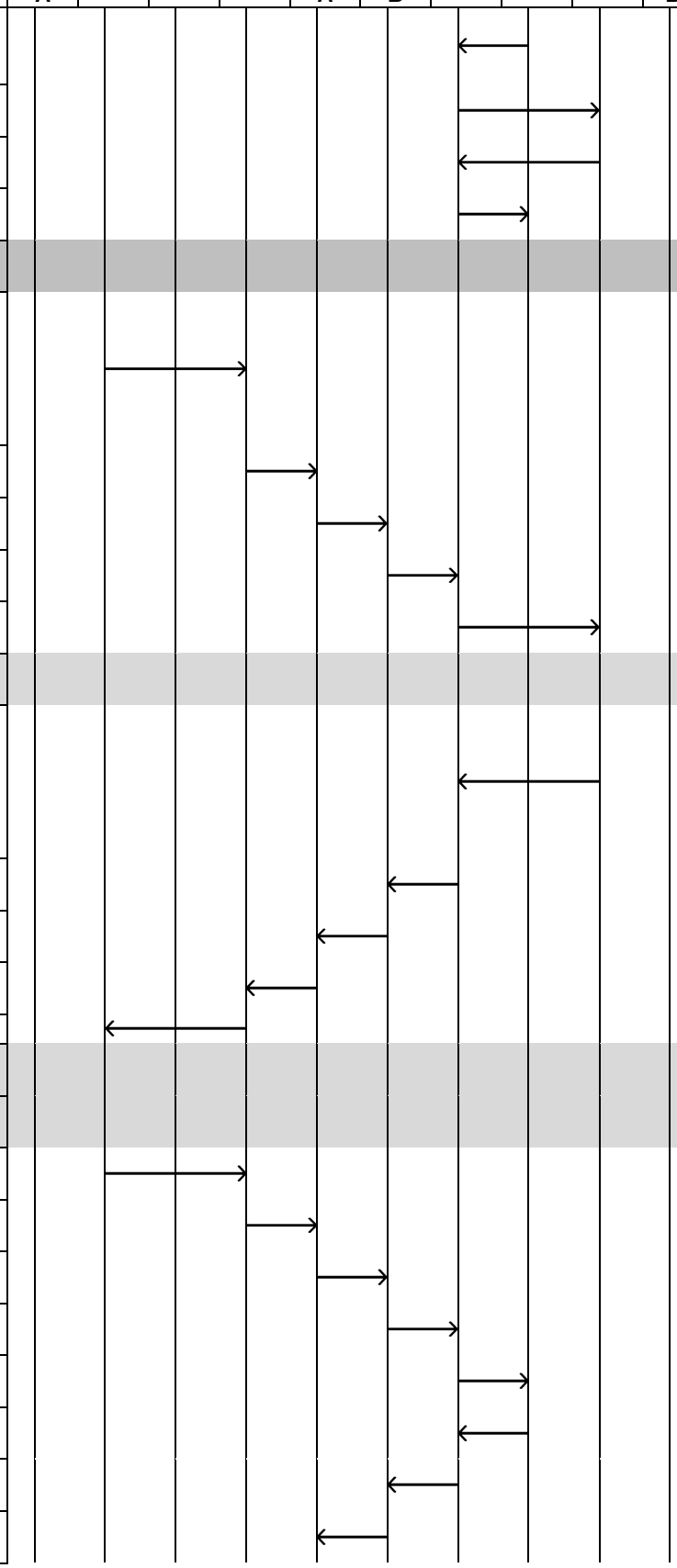
Step	Action	CF_INT_AS	CF_ROAM_AS (OPTIONAL)
1	User B publishes presence and capability information including capabilities	Step 1	Step 1
2	User B is informed of its presence status update	Step 6	Step 12
3	User A selects a contact of user B in the phone address book	Step 16	Step 34
4	User B is informed about user A capabilities	Step 22	Step 43
5	User A is informed about user B capabilities	Step 28	Step 52
6	User A subscribes to presence and capability information from User B	Step 29	Step 53
7	SUBSCRIPTION triggers the AS to send a NOTIFY to UE_B indicating the change to the watcher information subscriber	Step 48	Step 72
8	User B receives an authorization request from User A to see its own presence and capability information	Step 53	Step 83
9	User B authorizes user A to be informed of its own presence and capability information	Step 54	Step 84
10	User A is informed of user B presence and capability information	Step 63	Step 93
11	User A sees user B presence and capability information	Step 68	Step 104

NOTE: These flows show presence information and capabilities being retrieved via subscription (SIP SUBSCRIBE). Due to the sensitive nature of presence information, users would only typically share such information with a "buddy list". On the other hand, sharing of capabilities would typically be permitted to be shared to all users and thus would be retrieved via an anonymous SUBSCRIBE.

4.4.2.2.2 UC_RCS_2_I: SIP message flow for watcher subscription to presence event notification with CF_INT_AS

The expected call flow sequence is:

Step	Direction	Message	Comment
	User A / UE A / ASA / IMSA / IBCFA / IBCFB / IMSB / ASB / UEB / User B		
1			User B publishes presence and capability information including capabilities and optionally a list of users entitled to access the presence info (a "buddy list").
2	← UEB	PUBLISH	UE_B sends PUBLISH with information for all commonly supported presence elements and capabilities
3	→ ASB	PUBLISH	IMS_B forwards the PUBLISH to IMS_B AS (PS)
4	← ASB	200 OK	IMS_B AS responds with a 200 OK to IMS_B
5	→ UEB	200 OK	IMS_B forwards the 200 OK response to UE_B
6			User B is informed of its presence status update
7			User B subscribes to watcher event notification
8	← UEB	SUBSCRIBE	UE_B sends a SUBSCRIBE to be informed of event watcher information (Event: presence.winfo)
9	→ ASB	SUBSCRIBE	IMS_B forwards the SUBSCRIBE to IMS_B AS (PS)
10	← ASB	200 OK	IMS_B AS responds with a 200 OK to IMS_B
11	→ UEB	200 OK	IMS_B forwards the 200 OK response to IBCF_B



Step	Message	Comment
12	NOTIFY	IMS_B AS send a NOTIFY to IMS_B containing watcher info (XML body of "watcherinfo+XML").
13	NOTIFY	IMS_B forwards the NOTIFY response to UE_B
14	200 OK	UE_B sends 200 OK to the NOTIFY
15	200 OK	IMS_B forwards the 200 OK to IMS_B AS (PS)
16		User A selects a contact of user B in the phone address book
17	OPTIONS	UE_A sends OPTIONS to IMS_A with Accept-contact header containing user A capabilities (RCS services Tags and the Tag indicating support of social presence)
18	OPTIONS	IMS_A forwards OPTIONS to IBCF_A
19	OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
20	OPTIONS	IBCF_B forwards OPTIONS to IMS_B
21	OPTIONS	IMS_B forwards OPTIONS to UE_B
22		User B is informed about user A capabilities
23	200 OK	UE_B responds with 200 OK to IMS_B with Contact header containing user B capabilities (RCS services Tags and the Tag indicating support of social presence)
24	200 OK	IMS_B forwards 200 OK to IBCF_B
25	200 OK	IBCF_B forwards 200 OK to IBCF_A
26	200 OK	IBCF_A forwards 200 OK to IMS_A
27	200 OK	IMS_A forwards 200 OK to UE_A
28		User A is informed about user B capabilities
29		User A subscribes to social presence information from User B
30	SUBSCRIBE	UE_A sends SUBSCRIBE for "User B presence" event to IMS_A
31	SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IBCF_A
32	SUBSCRIBE	IBCF_A forwards the SUBSCRIBE to IBCF_B
33	SUBSCRIBE	IBCF_B forwards the SUBSCRIBE to IMS_B
34	SUBSCRIBE	IMS_B forwards the SUBSCRIBE to IMS_B AS (PS)
35	200 OK	IMS_B AS responds with a 200 OK to IMS_B
36	200 OK	IMS_B forwards the 200 OK response to IBCF_B
37	200 OK	IBCF_B forwards the 200 OK response to IBCF_A

Step	Direction										Message	Comment
	User A	UEA	ASA	IMSA	IBCFA	IBCFB	IMSB	ASB	UEB	User B		
38				←							200 OK	IBCF_A forwards the 200 OK response to IMS_A
39		←									200 OK	IMS_A forwards the 200 OK response to UE_A
40						←					NOTIFY	IMS_B AS sends NOTIFY to IBCF_B indicating that the subscription state is pending.
41					←						NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
42				←							NOTIFY	IBCF_A forwards NOTIFY to IMS_A
43		←									NOTIFY	IMS_A forwards the NOTIFY to UE_A
44		→									200 OK	UE_A responds with a 200 OK to IMS_A
45				→							200 OK	IMS_A forwards the 200 OK to IBCF_A
46					→						200 OK	IBCF_A forwards the 200 OK to IBCF_B
47						→					200 OK	IBCF_B forwards the 200 OK response to IMS_B AS
48												SUBSCRIPTION triggers the AS to send a NOTIFY to UE_B indicating the change to the watcher information subscriber
49							←				NOTIFY	IMS_B AS sends NOTIFY to IMS_B to indicate UE_B the change to the watcher information subscriber
50							→				NOTIFY	IMS_B forwards the NOTIFY to UE_B
51							←				200 OK	UE_B responds with a 200 OK to IMS_B
52							→				200 OK	IMS_B forwards the 200 OK response to IMS_B AS
53												User B receives an authorization request from User A to see its own presence and capability information (e.g. by sending a PUBLISH as in step 2)
54												User B authorizes user A to be informed of its own presence and capability information
55						←					NOTIFY	IMS_B AS sends NOTIFY to IBCF_B with a subscription state set to active and an XML body containing UE_B's presence information ("pidf+XML").
56					←						NOTIFY	IBCF_B sends NOTIFY to IBCF_A
57				←							NOTIFY	IBCF_A forwards NOTIFY to IMS_A
58		←									NOTIFY	IMS_A forwards the NOTIFY to UE_A
59		→									200 OK	UE_A responds with a 200 OK to IMS_A
60				→							200 OK	IMS_A forwards the 200 OK response to IBCF_A

Step	Direction										Message	Comment
	User A	UEA	ASA	IMSA	IBCFA	IBCFB	IMSB	ASB	UEB	User B		
61					→						200 OK	IBCF_A forwards the 200 OK response to IBCF_B
62						→		→			200 OK	IBCF_B forwards the 200 OK response to IMS_B AS
63												User A is informed of user B presence and capability information

4.4.2.2.3 UC_RCS_2_R: SIP message flow for watcher subscription to presence event notification with CF_ROAM_AS

The expected call flow sequence is:

Step	Direction										Message	Comment
	User A	UEA	ASA	IMSA	IBCFA	IBCFB	IMSB	ASB	UEB	User B		
1												User B publishes presence and capability information and optionally a list of users entitled to access the presence info (a "buddy list").
2				←					←		PUBLISH	UE_B sends PUBLISH with information for all commonly supported presence elements
3				→							PUBLISH	IMS_A forwards the PUBLISH to IBCF_A
4					→						PUBLISH	IBCF_A forwards the PUBLISH to IBCF_B
5						→					PUBLISH	IBCF_B forwards the PUBLISH to IMS_B
6							→				PUBLISH	IMS_B forwards the PUBLISH to IMS_B AS (PS)
7							←				200 OK	IMS_B AS responds with a 200 OK to IMS_B
8						←					200 OK	IMS_B forwards the 200 OK response to IBCF_B
9					←						200 OK	IBCF_B forwards the 200 OK response to IBCF_A
10				←							200 OK	IBCF_A forwards the 200 OK response to IMS_A
11				→					→		200 OK	IMS_A forwards the 200 OK response to UE_B
12												User B is informed of its presence status update
13												User B subscribes to be informed of watcher information.
14				←					←		SUBSCRIBE	UE_B sends a SUBSCRIBE to be informed of event watcher information (Event: presence.winfo)
15				→							SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IBCF_A
16					→						SUBSCRIBE	IBCF_A forwards the SUBSCRIBE to IBCF_B
17						→					SUBSCRIBE	IBCF_B forwards the SUBSCRIBE to IMS_B

Step	Direction										Message	Comment
	User A	UEA	ASA	IMSA	IBCFA	IBCFB	IMSB	ASB	UEB	User B		
18							→				SUBSCRIBE	IMS_B forwards the SUBSCRIBE to IMS_B AS (PS)
19							←				200 OK	IMS_B AS responds with a 200 OK to IMS_B
20						←					200 OK	IMS_B forwards the 200 OK response to IBCF_B
21					←						200 OK	IBCF_B forwards the 200 OK response to IBCF_A
22				←							200 OK	IBCF_A forwards the 200 OK response to IMS_A
23				→					→		200 OK	IMS_A forwards the 200 OK response to UE_B
24							←				NOTIFY	IMS_B AS send a NOTIFY to IMS_B containing watcher info (XML body of "watcherinfo+XML").
25						←					NOTIFY	IMS_B forwards the NOTIFY response to IBCF_B
26					←						NOTIFY	IBCF_B forwards the NOTIFY response to IBCF_A
27				←							NOTIFY	IBCF_A forwards the NOTIFY response to IMS_A
28				→					→		NOTIFY	IMS_A forwards the NOTIFY response to UE_B
29				←					←		200 OK	UE_B sends a 200 OK to the NOTIFY
30				→							200 OK	IMS_A forwards the 200 OK to IBCF_A
31					→						200 OK	IBCF_A forwards the 200 OK to IBCF_B
32						→					200 OK	IBCF_B forwards the 200 OK to IMS_B
33							→				200 OK	IMS_B forwards the 200 OK to IMS_B AS (PS)
34												User A selects a contact of user B in the phone address book
35											OPTIONS	UE_A sends OPTIONS to IMS_A with Accept-contact header containing user A capabilities (RCS services Tags and the Tag indicating support of social presence)
36											OPTIONS	IMS_A forwards OPTIONS to IBCF_A
37											OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
38											OPTIONS	IBCF_B forwards OPTIONS to IMS_B
39											OPTIONS	IMS_B forwards OPTIONS to IBCF_B
40											OPTIONS	IBCF_B forwards OPTIONS to IBCF_A
41											OPTIONS	IBCF_A forwards OPTIONS to IMS_A
42											OPTIONS	IMS_A forwards OPTIONS to UE_B
43												User B is informed about user A capabilities

Step	Direction										Message	Comment
	User A	UE A	ASA	IMS A	IBCF A	IBCF B	IMS B	AS B	UE B	User B		
44											200 OK	UE_B responds with 200 OK to IMS_A with Contact header containing user B capabilities (RCS services Tags and the Tag indicating support of social presence)
45											200 OK	IMS_A forwards 200 OK to IBCF_A
46											200 OK	IBCF_A forwards 200 OK to IBCF_B
47											200 OK	IBCF_B forwards 200 OK to IMS_B
48											200 OK	IMS_B forwards 200 OK to IBCF_B
49											200 OK	IBCF_B forwards 200 OK to IBCF_A
50											200 OK	IBCF_A forwards 200 OK to IMS_A
51											200 OK	IMS_A forwards 200 OK to UE_A
52												User A is informed about user B capabilities
53												User A subscribes to social presence information from User B
54		→	→								SUBSCRIBE	UE_A sends SUBSCRIBE for "User B presence" info to IMS_A
55				→							SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IBCF_A
56					→						SUBSCRIBE	IBCF_A forwards the SUBSCRIBE to IBCF_B
57						→					SUBSCRIBE	IBCF_B forwards the SUBSCRIBE to IMS_B
58							→				SUBSCRIBE	IMS_B forwards the SUBSCRIBE to IMS_B AS (PS)
59							←				200 OK	IMS_B AS responds with a 200 OK to IMS_B
60						←					200 OK	IMS_B forwards the 200 OK response to IBCF_B
61					←						200 OK	IBCF_B forwards the 200 OK response to IBCF_A
62				←							200 OK	IBCF_A forwards the 200 OK response to IMS_A
63		←	←								200 OK	IMS_A forwards the 200 OK response to UE_A
64						←	→				NOTIFY	IMS_B AS sends NOTIFY to IBCF_B indicating a subscription state of pending.
65					←						NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
66				←							NOTIFY	IBCF_A forwards NOTIFY to IMS_A
67		←	←								NOTIFY	IMS_A forwards the NOTIFY to UE_A
68		→	→								200 OK	UE_A responds with a 200 OK to IMS_A
69				→							200 OK	IMS_A forwards the 200 OK to IBCF_A
70					→						200 OK	IBCF_A forwards the 200 OK to IBCF_B
71						→	→				200 OK	IBCF_B forwards the 200 OK response to IMS_B AS

Step	Direction										Message	Comment
	User A	UEA	ASA	IMSA	IBCFA	IBCFB	IMSB	ASB	UEB	User B		
72												SUBSCRIPTION triggers the AS to send a NOTIFY to UE_B indicating the change to the watcher information subscriber
73							←				NOTIFY	IMS_B AS sends NOTIFY to IMS_B to indicate UE_B the change to the watcher information subscriber
74						←					NOTIFY	IMS_B forwards the NOTIFY to IBCF_B
75					←						NOTIFY	IBCF_B forwards the NOTIFY to IBCF_A
76				←							NOTIFY	IBCF_A forwards the NOTIFY to IMS_A
77				→					→		NOTIFY	IMS_A forwards the NOTIFY to UE_B
78				←					←		200 OK	UE_B responds with a 200 OK to IMS_A
79				→							200 OK	IMS_A forwards the 200 OK response to IBCF_A
80					→						200 OK	IBCF_A forwards the 200 OK response to IBCF_B
81						→						IBCF_B forwards the 200 OK response to IMS_B
82							→				200 OK	IMS_B forwards the 200 OK response to IMS_B AS
83												User B receives an authorization request from User A to see its own presence and capability information
84												User B authorizes user A to be informed of its own presence and capability information (e.g. by sending a PUBLISH as in step 2)
85								←			NOTIFY	IMS_B AS sends NOTIFY to IBCF_B with subscription state set to active and containing User B's presence information in a XML body (pidf+XML).
86					←						NOTIFY	IBCF_B sends NOTIFY to IBCF_A
87				←							NOTIFY	IBCF_A forwards NOTIFY to IMS_A
88		←									NOTIFY	IMS_A forwards the NOTIFY to UE_A
89		→									200 OK	UE_A responds with a 200 OK to IMS_A
90				→							200 OK	IMS_A forwards the 200 OK response to IBCF_A
91					→						200 OK	IBCF_A forwards the 200 OK response to IBCF_B
92						→					200 OK	IBCF_B forwards the 200 OK response to IMS_B AS
93												User A is informed of user B presence and capability information
94							←					
95						←						
96					←							
97				←								
98				→					→			

Step	Direction										Message	Comment
	User A	UEA	ASA	IMSA	IBCFA	IBCFB	IMSB	ASB	UEB	User B		
99				←					←			
100				→								
101					→							
102						→						
103							→					
104												User A sees user B presence and capability information

4.4.2.3 Watcher subscription to resource list

4.4.2.3.1 Description

UE_B publishes its presence information and subscribes to receive notifications with watcher information. User B has also authorized User A to see its presence information. User A is authorized to use resource lists which are considered to be XDMS lists of contacts provisioned in the user client and AS. UE_A subscribes to presence information state changes of a list of users containing UE_B. This test requires the use of application server in IMS_B, having the role of Presence Server (PS), and the use of application server in IMS_A, having the role of Resource List Server (RLS). The RLS and PS have also previously exchanged capabilities. The call flow path and node configuration for this use case corresponds to CF_INT_AS in case of interworking and CF_ROAM_AS in case of roaming.

The test sequence typically associated with this use case is as follows (CFW step numbers refer the call flow step numbering):

Step	Action	CF_INT_AS	CF_ROAM_AS (OPTIONAL)
1	User B publishes presence and capability information	Step 1	Step 1
2	User B is informed of its presence status update	Step 6	Step 12
3	User A subscribes to resource list previously stored in the User A client as XDMS list of contacts	Step 16	Step 34
4	RLS performs authorization checks to ensure that User A is authorized to use resource lists	Step 19	Step 37
5	RLS resolves watcher resource´s address and subscribes for presence event notification for all the presentities represented by the resource list SIP URI	Step 26	Step 44
6	PS performs authorization checks on the originator to ensure it is allowed to watch the presentity	Step 32	Step 50
7	RLS notifies with presence and capability information for all the presentities represented by the resource list SIP URI	Step 46	Step 64
8	User A sees user B presence and capability information	Step 51	Step 69

4.4.2.3.2 UC_RCS_3_I: SIP message flow for watcher subscription to resource list with CF_INT_AS

The expected call flow sequence is:

Step	Direction										Message	Comment
	User A	UEA	ASA	IMSA	IBCFA	IBCFB	IMSB	ASB	UEB	User B		
1												User B publishes presence and capability information
2							←		←		PUBLISH	UE_B sends PUBLISH with information for all commonly supported presence and capability elements

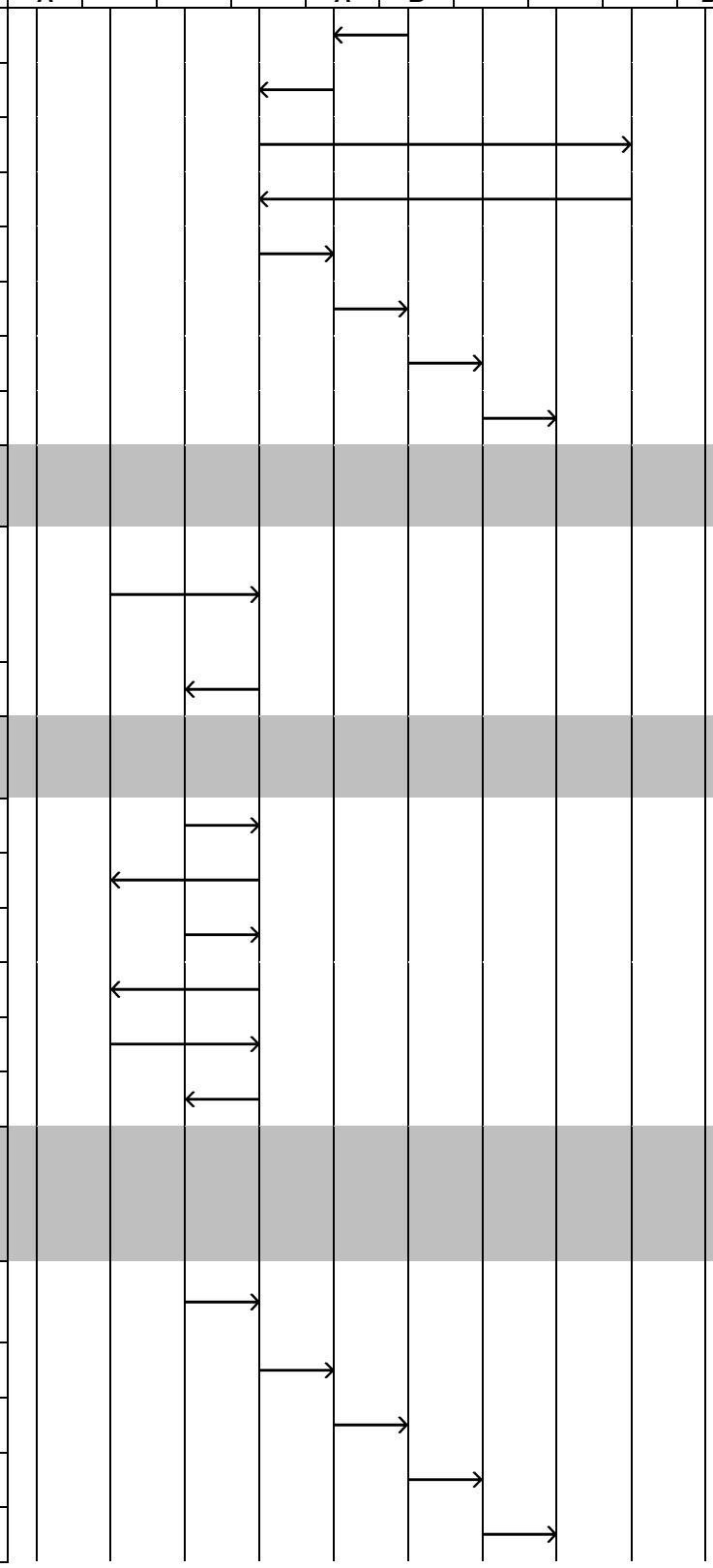
Step	Direction										Message	Comment
	User A	UEA	ASA	IMSA	IBCFA	IBCFB	IMSB	ASB	UEB	User B		
3							→				PUBLISH	IMS_B forwards the PUBLISH to IMS_B AS (PS)
4							←				200 OK	IMS_B AS responds with a 200 OK to IMS_B
5							→		→		200 OK	IMS_B forwards the 200 OK response to UE_B
6												User B is informed of its presence status update
7												User B subscribes to watcher event notification
8							←		←		SUBSCRIBE	UE_B sends a SUBSCRIBE to be informed of event watcher information (Event: presence.winfo)
9							→				SUBSCRIBE	IMS_B forwards the SUBSCRIBE to IMS_B AS (PS)
10							←				200 OK	IMS_B AS responds with a 200 OK to IMS_B
11							→		→		200 OK	IMS_B forwards the 200 OK response to IBCF_B
12							←				NOTIFY	IMS_B AS send a NOTIFY to IMS_B containing watcher info (XML body of "watcherinfo+XML").
13							→		→		NOTIFY	IMS_B forwards the NOTIFY response to UE_B
14							←		←		200 OK	UE_B sends 200 OK to the NOTIFY
15							→				200 OK	IMS_B forwards the 200 OK to IMS_B AS (PS)
16												User A subscribes to resource list previously stored in the User A client as XDMS list of contacts
17		→	→	→							SUBSCRIBE	UE_A sends ANONYMOUS SUBSCRIBE for "presence" event with expiry time of 0 to IMS_A indicating support to "eventlist" to a resource list SIP URI
18			←	←							SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IMS_A AS (RLS)
19												RLS performs authorization checks to ensure that User A is authorized to use resource lists
20			→	→							200 OK	IMS_A AS responds with a 200 OK to IMS_A
21		←	←	←							200 OK	IMS_A forwards the 200 OK response to UE_A
22			→	→							NOTIFY	IMS_A AS sends NOTIFY to IMS_A
23		←	←	←							NOTIFY	IMS_A forwards the NOTIFY to UE_A
24		→	→	→							200 OK	UE_A responds with a 200 OK to IMS_A
25			←	←							200 OK	IMS_A forwards the 200 OK response to IMS_A AS
26												RLS resolves watcher resource´s address and subscribes for presence event notification for all the presentities represented by the resource list SIP URI

Step	Direction										Message	Comment
	User A	UEA	ASA	IMSA	IBCFA	IBCFB	IMSB	ASB	UEB	User B		
27			→	→							SUBSCRIBE	IMS_A AS (RLS) sends SUBSCRIBE for "presence" event to IMS_A
28				→	→						SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IBCF_A
29					→	→					SUBSCRIBE	IBCF_A forwards the SUBSCRIBE to IBCF_B
30						→	→				SUBSCRIBE	IBCF_B forwards the SUBSCRIBE to IMS_B
31							→	→			SUBSCRIBE	IMS_B forwards the SUBSCRIBE to IMS_B AS (PS)
32												PS performs authorization checks on the originator to ensure it is allowed to watch the presentity. In this case, User A is already authorized to access the presence info of User B.
33							←	←			200 OK	IMS_B AS (PS) responds with a 200 OK to IMS_B
34						←	←				200 OK	IMS_B forwards the 200 OK response to IBCF_B
35					←	←					200 OK	IBCF_B forwards the 200 OK response to IBCF_A
36				←	←						200 OK	IBCF_A forwards the 200 OK response to IMS_A
37			←	←							200 OK	IMS_A forwards the 200 OK response to IMS_A AS (RLS)
38						←	←				NOTIFY	IMS_B AS sends a NOTIFY to IBCF_B with the presence and capability information of UE_B (XML body of "pidf+XML").
39					←	←					NOTIFY	IBCF_B forwards the NOTIFY to IBCF_A
40				←	←							IBCF_A forwards the NOTIFY to IMS_A
41			←	←							NOTIFY	IMS_A forwards the NOTIFY to IMS_A AS (RLS)
42			→	→							200 OK	IMS_A AS responds with a 200 OK to IMS_A
43				→	→						200 OK	IMS_A forwards the 200 OK response to IBCF_A
44					→	→					200 OK	IBCF_A forwards the 200 OK response to IBCF_B
45						→	→				200 OK	IBCF_B forwards the 200 OK response to IMS_B AS
46												RLS notifies with presence and capability information for all the presentities represented by the resource list SIP URI
47			→	→							NOTIFY	IMS_A AS sends NOTIFY to IMS_A
48		←	←								NOTIFY	IMS_A forwards the NOTIFY to UE_A
49		→	→								200 OK	UE_A responds with a 200 OK to IMS_A
50			←	←							200 OK	IMS_A forwards the 200 OK response to IMS_A AS
51												User A sees presence and capability information of the users in the resource list.

4.4.2.3.3 UC_RCS_3_R: SIP message flow for watcher subscription to resource list with CF_ROAM_AS

The expected call flow sequence is:

Step	Direction	Message	Comment
1			User B publishes presence and capability information
2	UE_B → IMS_A	PUBLISH	UE_B sends PUBLISH with information for all commonly supported presence and capability elements
3	IMS_A → IBCF_A	PUBLISH	IMS_A forwards the PUBLISH to IBCF_A
4	IBCF_A → IBCF_B	PUBLISH	IBCF_A forwards the PUBLISH to IBCF_B
5	IBCF_B → IMS_B	PUBLISH	IBCF_B forwards the PUBLISH to IMS_B
6	IMS_B → IMS_B AS (PS)	PUBLISH	IMS_B forwards the PUBLISH to IMS_B AS (PS)
7	IMS_B AS → IMS_B	200 OK	IMS_B AS responds with a 200 OK to IMS_B
8	IMS_B → IBCF_B	200 OK	IMS_B forwards the 200 OK response to IBCF_B
9	IBCF_B → IBCF_A	200 OK	IBCF_B forwards the 200 OK response to IBCF_A
10	IBCF_A → IMS_A	200 OK	IBCF_A forwards the 200 OK response to IMS_A
11	IMS_A → UE_B	200 OK	IMS_A forwards the 200 OK response to UE_B
12			User B is informed of its presence status update
13			User B subscribes to be informed of watcher information.
14	UE_B → IMS_A	SUBSCRIBE	UE_B sends a SUBSCRIBE to be informed of event watcher information (Event: presence.winfo)
15	IMS_A → IBCF_A	SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IBCF_A
16	IBCF_A → IBCF_B	SUBSCRIBE	IBCF_A forwards the SUBSCRIBE to IBCF_B
17	IBCF_B → IMS_B	SUBSCRIBE	IBCF_B forwards the SUBSCRIBE to IMS_B
18	IMS_B → IMS_B AS (PS)	SUBSCRIBE	IMS_B forwards the SUBSCRIBE to IMS_B AS (PS)
19	IMS_B AS → IMS_B	200 OK	IMS_B AS responds with a 200 OK to IMS_B
20	IMS_B → IBCF_B	200 OK	IMS_B forwards the 200 OK response to IBCF_B
21	IBCF_B → IBCF_A	200 OK	IBCF_B forwards the 200 OK response to IBCF_A
22	IBCF_A → IMS_A	200 OK	IBCF_A forwards the 200 OK response to IMS_A
23	IMS_A → UE_B	200 OK	IMS_A forwards the 200 OK response to UE_B
24	IMS_B AS → IMS_B	NOTIFY	IMS_B AS send a NOTIFY to IMS_B containing watcher info (XML body of "watcherinfo+XML").
25	IBCF_B → IMS_B	NOTIFY	IMS_B forwards the NOTIFY response to IBCF_B



Step	Direction										Message	Comment
	User A	UEA	ASA	IMSA	IBCFA	IBCFB	IMSB	ASB	UEB	User B		
26					←						NOTIFY	IBCF_B forwards the NOTIFY response to IBCF_A
27				←							NOTIFY	IBCF_A forwards the NOTIFY response to IMS_A
28				→					→		NOTIFY	IMS_A forwards the NOTIFY response to UE_B
29				←					←		200 OK	UE_B sends a 200 OK to the NOTIFY
30				→	→						200 OK	IMS_A forwards the 200 OK to IBCF_A
31					→	→					200 OK	IBCF_A forwards the 200 OK to IBCF_B
32						→	→				200 OK	IBCF_B forwards the 200 OK to IMS_B
33							→	→			200 OK	IMS_B forwards the 200 OK to IMS_B AS (PS)
34												User A subscribes to resource list previously stored in the User A client as XDMS list of contacts
35		→	→	→							SUBSCRIBE	UE_A sends ANONYMOUS SUBSCRIBE for "presence" event with expiry time of 0 to IMS_A indicating support to "eventlist" to a resource list SIP URI
36			←								SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IMS_A AS (RLS)
37												RLS performs authorization checks to ensure that User A is authorized to use resource lists
38			→	→							200 OK	IMS_A AS responds with a 200 OK to IMS_A
39		←		←							200 OK	IMS_A forwards the 200 OK response to UE_A
40			→	→							NOTIFY	IMS_A AS sends NOTIFY to IMS_A
41		←		←							NOTIFY	IMS_A forwards the NOTIFY to UE_A
42		→		→							200 OK	UE_A responds with a 200 OK to IMS_A
43			←								200 OK	IMS_A forwards the 200 OK response to IMS_A AS
44												RLS resolves watcher resource´s address and subscribes for presence event notification for all the presentities represented by the resource list SIP URI
45			→	→							SUBSCRIBE	IMS_A AS (RLS) sends SUBSCRIBE for "presence" event to IMS_A
46				→	→						SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IBCF_A
47					→	→					SUBSCRIBE	IBCF_A forwards the SUBSCRIBE to IBCF_B
48						→	→				SUBSCRIBE	IBCF_B forwards the SUBSCRIBE to IMS_B
49							→	→			SUBSCRIBE	IMS_B forwards the SUBSCRIBE to IMS_B AS (PS)

Step	Direction										Message	Comment
	User A	UEA	ASA	IMSA	IBCFA	IBCFB	IMSB	ASB	UEB	User B		
50												PS performs authorization checks on the originator to ensure it is allowed to watch the presentity. In this case, User A is already authorized to access the presence info of User B.
51							←				200 OK	IMS_B AS (PS) responds with a 200 OK to IMS_B
52						←					200 OK	IMS_B forwards the 200 OK response to IBCF_B
53					←						200 OK	IBCF_B forwards the 200 OK response to IBCF_A
54				←							200 OK	IBCF_A forwards the 200 OK response to IMS_A
55			←								200 OK	IMS_A forwards the 200 OK response to IMS_A AS (RLS)
56						←					NOTIFY	IMS_B AS sends a NOTIFY to IBCF_B with the presence and capability information of UE_B in an XML body ("pidf+XML").
57					←						NOTIFY	IBCF_B forwards the NOTIFY to IBCF_A
58				←								IBCF_A forwards the NOTIFY to IMS_A
59			←								NOTIFY	IMS_A forwards the NOTIFY to IMS_A AS (RLS)
60			→								200 OK	IMS_A AS responds with a 200 OK to IMS_A
61				→							200 OK	IMS_A forwards the 200 OK response to IBCF_A
62					→						200 OK	IBCF_A forwards the 200 OK response to IBCF_B
63							→	→			200 OK	IBCF_B forwards the 200 OK response to IMS_B AS
64												RLS notifies with presence and capability information for all the presentities represented by the resource list SIP URI
65			→								NOTIFY	IMS_A AS sends NOTIFY to IMS_A
66		←									NOTIFY	IMS_A forwards the NOTIFY to UE_A
67		→									200 OK	UE_A responds with a 200 OK to IMS_A
68			←								200 OK	IMS_A forwards the 200 OK response to IMS_A AS
69												User A sees presence and capability information for all of the users in the resource list.

4.4.3 IM/chat service

4.4.3.1 General description

IM/chat service session assumes the possibility for users to receive the following types of services:

- 1-to-1 chat (including support of notifications and file transfer within 1-to-1 chat);
- 1-to-many chat.

For all Use Cases it is assumed that UEs registered on the corresponding IMS networks and they have already performed capability discovery procedures. In particular, users subscribed to IM/chat service.

4.4.3.2 1-to-1 chat standard procedure

Following there are the expected common call flow sequences for the standard procedures of 1-to-1 chat service between RCS users.

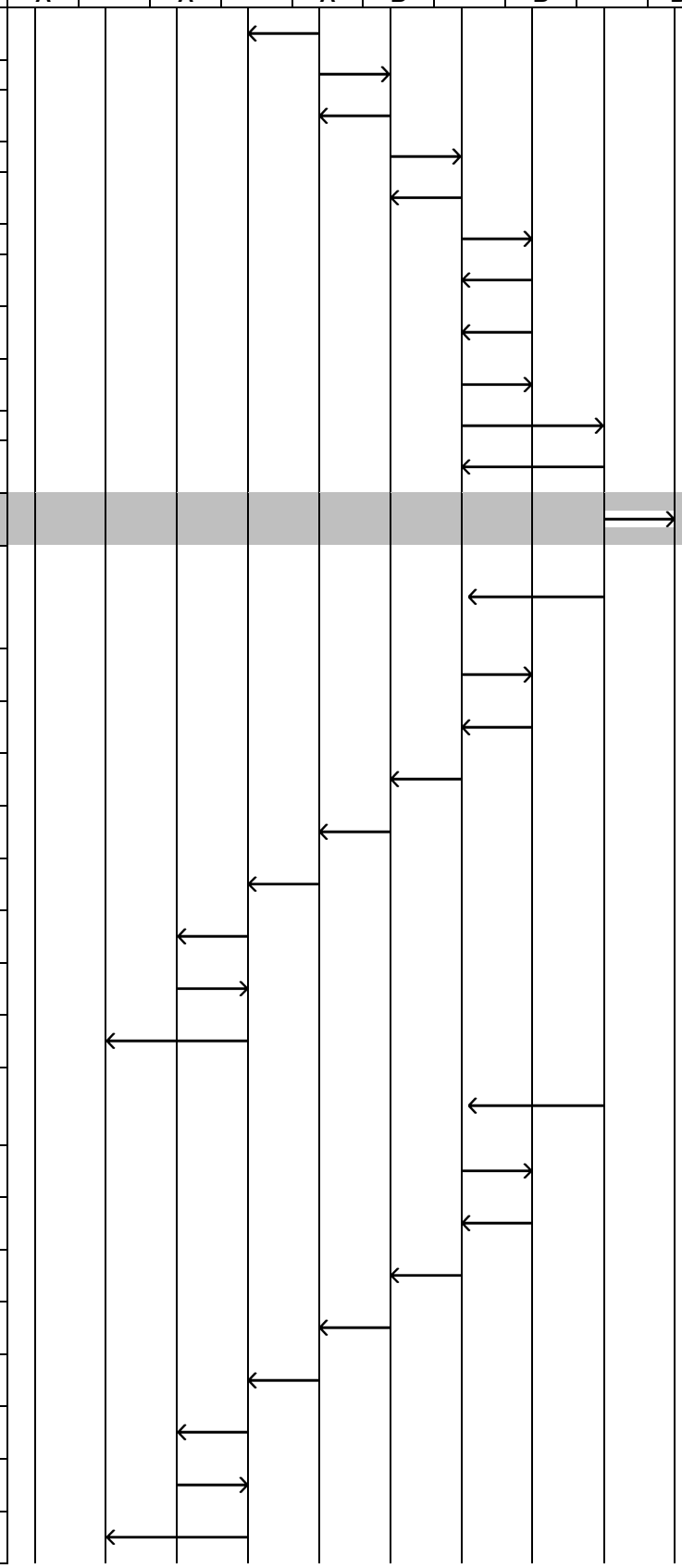
4.4.3.2.1 UC_RCS_4_I: SIP message flow for 1-to-1 chat standard procedure with CF_INT_AS

The test sequence typically associated with this use case is as follows (CFW step numbers refer the call flow step numbering):

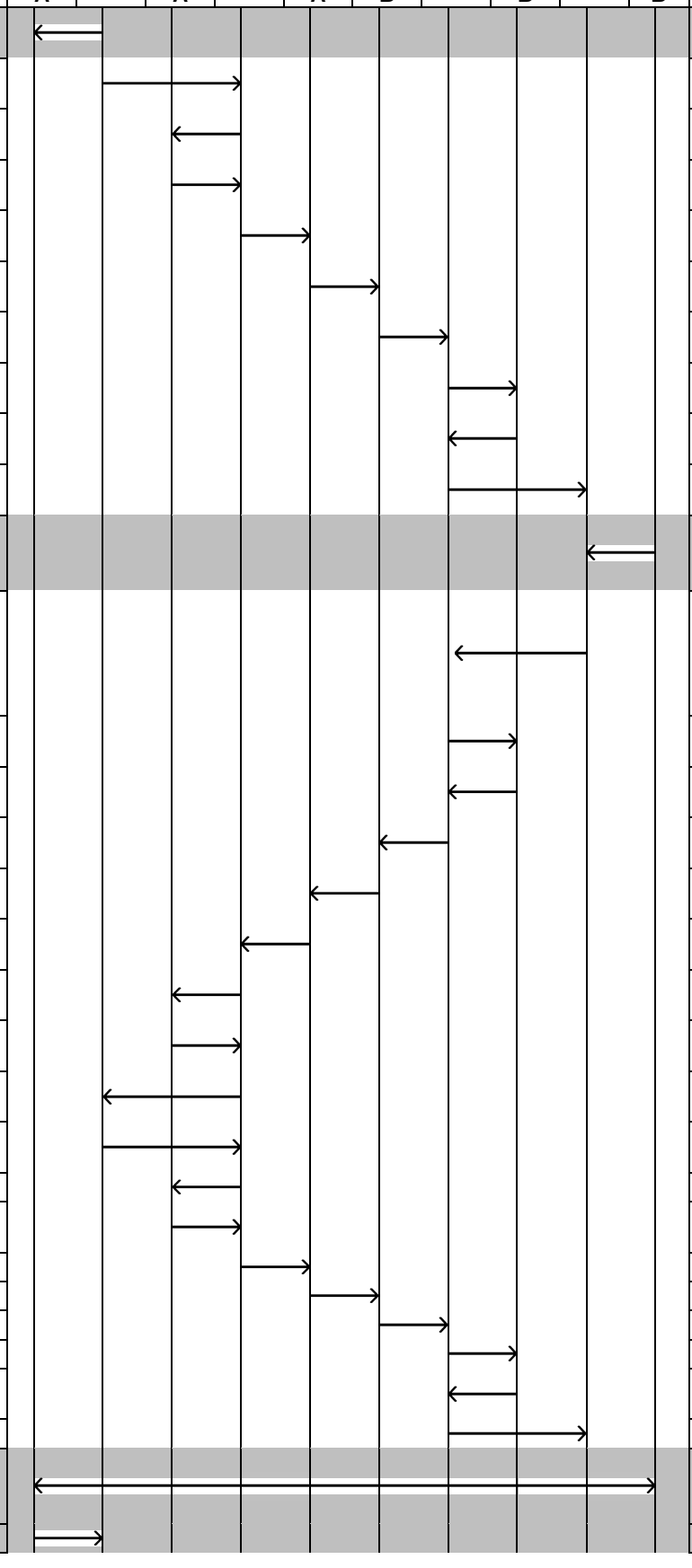
Step	Action	CF_INT_AS
1	User A selects User B in the phone address book and sends him an initial message	Step 1
2	User B is informed of incoming message	Step 20
3	User A is informed that initial message was delivered to user B	Step 39
4	User B reads the initial message from user A and opens the 1-to-1 chat	Step 49
5	Users perform chatting	Step 68
6A	User A closes the 1-to-1 chat	Step 69A
6B	User B closes the 1-to-1 chat	Step 69B
7A	User A is informed that 1-to-1 chat with user B is closed	Step 88A
7B	User B is informed that 1-to-1 chat with user A is closed	Step 88B

The expected call flow sequence is:

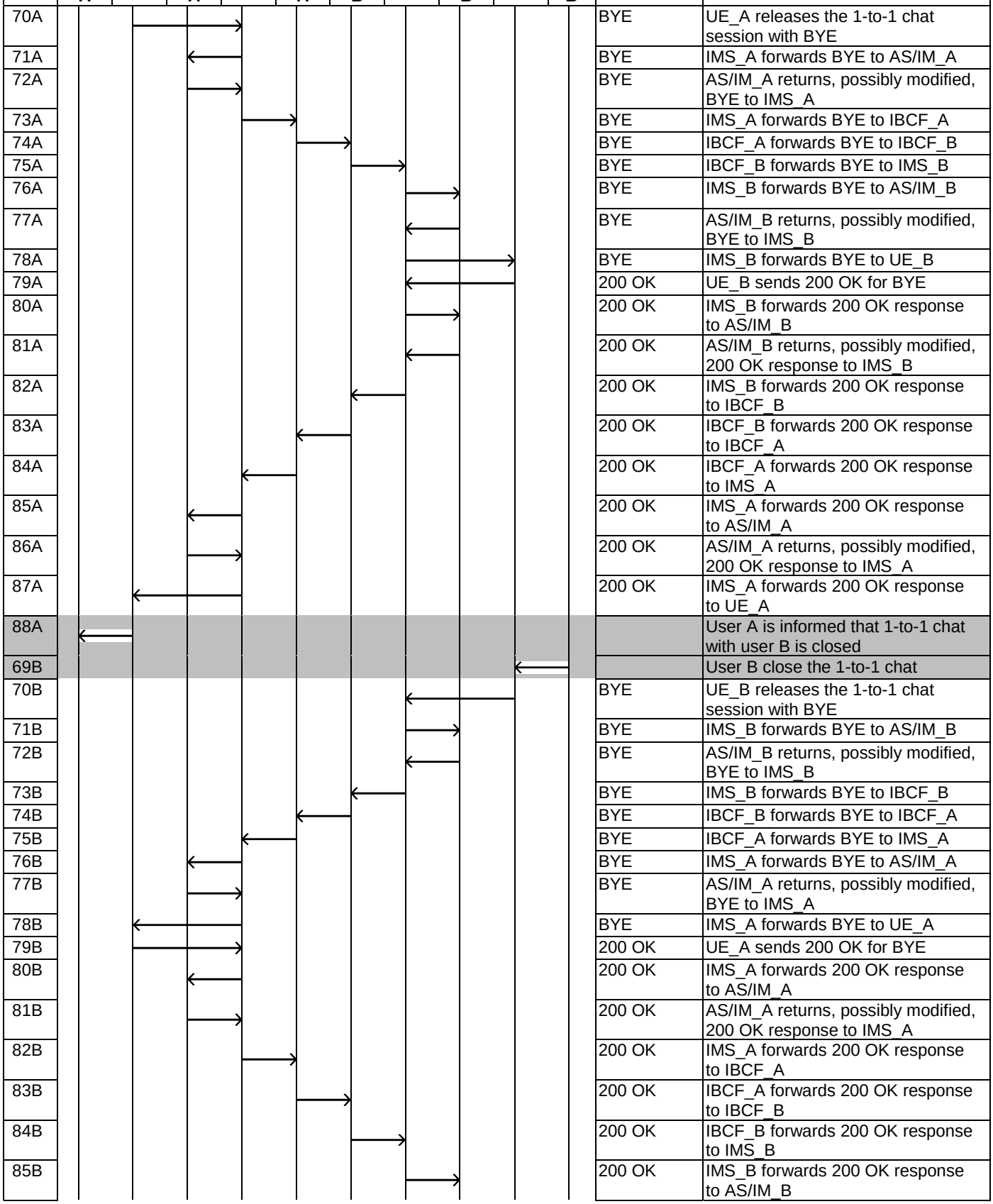
Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
1	→											User A selects User B in the phone address book and sends him an initial message
2		→	→								INVITE	UE_A sends INVITE to IMS_A with user A initial message in the Subject header, CPIM/IMND headers and the first SDP offer indicating all specific data for MSRP connection set up
3		←	←								100 Trying	IMS_A responds with a 100 Trying provisional response
4			←								INVITE	IMS_A forwards INVITE to AS/IM_A
5			→								100 Trying	AS/IM_A responds with a 100 Trying provisional response
6			→								INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
7			←								100 Trying	IMS_A responds with a 100 Trying provisional response
8				→							INVITE	IMS_A forwards INVITE to IBCF_A



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
9				←							100 Trying	IBCF_A responds with a 100 Trying provisional response
10					→						INVITE	IBCF_A forwards INVITE to IBCF_B
11					←						100 Trying	IBCF_B responds with a 100 Trying provisional response
12						→					INVITE	IBCF_B forwards INVITE to IMS_B
13						←					100 Trying	IMS_B responds with a 100 Trying provisional response
14							→				INVITE	IMS_B forwards INVITE to AS/IM_B
15							←				100 Trying	AS/IM_B responds with a 100 Trying provisional response
16							←				INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
17							→				100 Trying	IMS_B responds with a 100 Trying provisional response
18								→			INVITE	IMS_B forwards INVITE to UE_B
19							←				100 Trying	UE_B optionally responds with a 100 Trying provisional response
20									→			User B is informed of incoming message
21							←				180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that invitation to a 1-to-1 chat session has reached the invited user
22							→				180 Ringing	IMS_B forwards 180 Ringing response to AS/IM_B
23							←				180 Ringing	AS/IM_B returns, possibly modified, 180 Ringing response to IMS_B
24						←					180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
25					←						180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
26				←							180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
27			←								180 Ringing	IMS_A forwards 180 Ringing response to AS/IM_A
28			→								180 Ringing	AS/IM_A returns, possibly modified, 180 Ringing response to IMS_A
29		←									180 Ringing	IMS_A forwards 180 Ringing response to UE_A
30							←				MESSAGE	UE_B sends MESSAGE to IMS_B with delivery notification of initial message from user A
31							→				MESSAGE	IMS_B forwards MESSAGE to AS/IM_B
32							←				MESSAGE	AS/IM_B returns, possibly modified, MESSAGE to IMS_B
33						←					MESSAGE	IMS_B forwards MESSAGE to IBCF_B
34					←						MESSAGE	IBCF_B forwards MESSAGE to IBCF_A
35				←							MESSAGE	IBCF_A forwards MESSAGE to IMS_A
36			←								MESSAGE	IMS_A forwards MESSAGE to AS/IM_A
37			→								MESSAGE	AS/IM_A returns, possibly modified, MESSAGE to IMS_A
38		←									MESSAGE	IMS_A forwards MESSAGE to UE_A



Step	Direction	Message	Comment
	User A / UE A / AS/IM A / IMS A / IBCF A / IBCF B / IMS B / AS/IM B / UE B / User B		
39			User A is informed that initial message was delivered to user B
40		200 OK	UE_A responds MESSAGE with 200 OK response
41		200 OK	IMS_A forwards 200 OK response to AS/IM_A
42		200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
43		200 OK	IMS_A forwards 200 OK response to IBCF_A
44		200 OK	IBCF_A forwards 200 OK response to IBCF_B
45		200 OK	IBCF_B forwards 200 OK response to IMS_B
46		200 OK	IMS_B forwards 200 OK response to AS/IM_B
47		200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
48		200 OK	IMS_B forwards 200 OK response to UE_B
49			User B reads the initial message from user A and opens the 1-to-1 chat
50		200 OK	UE_B responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform A-side with specific data for MSRP connection set up
51		200 OK	IMS_B forwards 200 OK response to AS/IM_B
52		200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
53		200 OK	IMS_B forwards 200 OK response to IBCF_B
54		200 OK	IBCF_B forwards 200 OK response to IBCF_A
55		200 OK	IBCF_A forwards 200 OK response to IMS_A
56		200 OK	IMS_A forwards 200 OK response to AS/IM_A
57		200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
58		200 OK	IMS_A forwards 200 OK response to UE_A
59		ACK	UE_A acknowledges the receipt of 200 OK for INVITE
60		ACK	IMS_A forwards ACK to AS/IM_A
61		ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
62		ACK	IMS_A forwards ACK to IBCF_A
63		ACK	IBCF_A forwards ACK to IBCF_B
64		ACK	IBCF_B forwards ACK to IMS_B
65		ACK	IMS_B forwards ACK to AS/IM_B
66		ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
67		ACK	IMS_B forwards ACK to UE_B
68			Users perform chatting (see clause 5.3.1 Chat 1 to 1 via MSRP and use 5.4.1 test description)
69A			User A closes the 1-to-1 chat



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
70A											BYE	UE_A releases the 1-to-1 chat session with BYE
71A											BYE	IMS_A forwards BYE to AS/IM_A
72A											BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
73A											BYE	IMS_A forwards BYE to IBCF_A
74A											BYE	IBCF_A forwards BYE to IBCF_B
75A											BYE	IBCF_B forwards BYE to IMS_B
76A											BYE	IMS_B forwards BYE to AS/IM_B
77A											BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
78A											BYE	IMS_B forwards BYE to UE_B
79A											200 OK	UE_B sends 200 OK for BYE
80A											200 OK	IMS_B forwards 200 OK response to AS/IM_B
81A											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
82A											200 OK	IMS_B forwards 200 OK response to IBCF_B
83A											200 OK	IBCF_B forwards 200 OK response to IBCF_A
84A											200 OK	IBCF_A forwards 200 OK response to IMS_A
85A											200 OK	IMS_A forwards 200 OK response to AS/IM_A
86A											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
87A											200 OK	IMS_A forwards 200 OK response to UE_A
88A												User A is informed that 1-to-1 chat with user B is closed
69B												User B close the 1-to-1 chat
70B											BYE	UE_B releases the 1-to-1 chat session with BYE
71B											BYE	IMS_B forwards BYE to AS/IM_B
72B											BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
73B											BYE	IMS_B forwards BYE to IBCF_B
74B											BYE	IBCF_B forwards BYE to IBCF_A
75B											BYE	IBCF_A forwards BYE to IMS_A
76B											BYE	IMS_A forwards BYE to AS/IM_A
77B											BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
78B											BYE	IMS_A forwards BYE to UE_A
79B											200 OK	UE_A sends 200 OK for BYE
80B											200 OK	IMS_A forwards 200 OK response to AS/IM_A
81B											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
82B											200 OK	IMS_A forwards 200 OK response to IBCF_A
83B											200 OK	IBCF_A forwards 200 OK response to IBCF_B
84B											200 OK	IBCF_B forwards 200 OK response to IMS_B
85B											200 OK	IMS_B forwards 200 OK response to AS/IM_B

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
86B							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
87B							→		→		200 OK	IMS_B forwards 200 OK response to UE_B
88B									→			User B is informed that that 1-to-1 chat with user A is closed

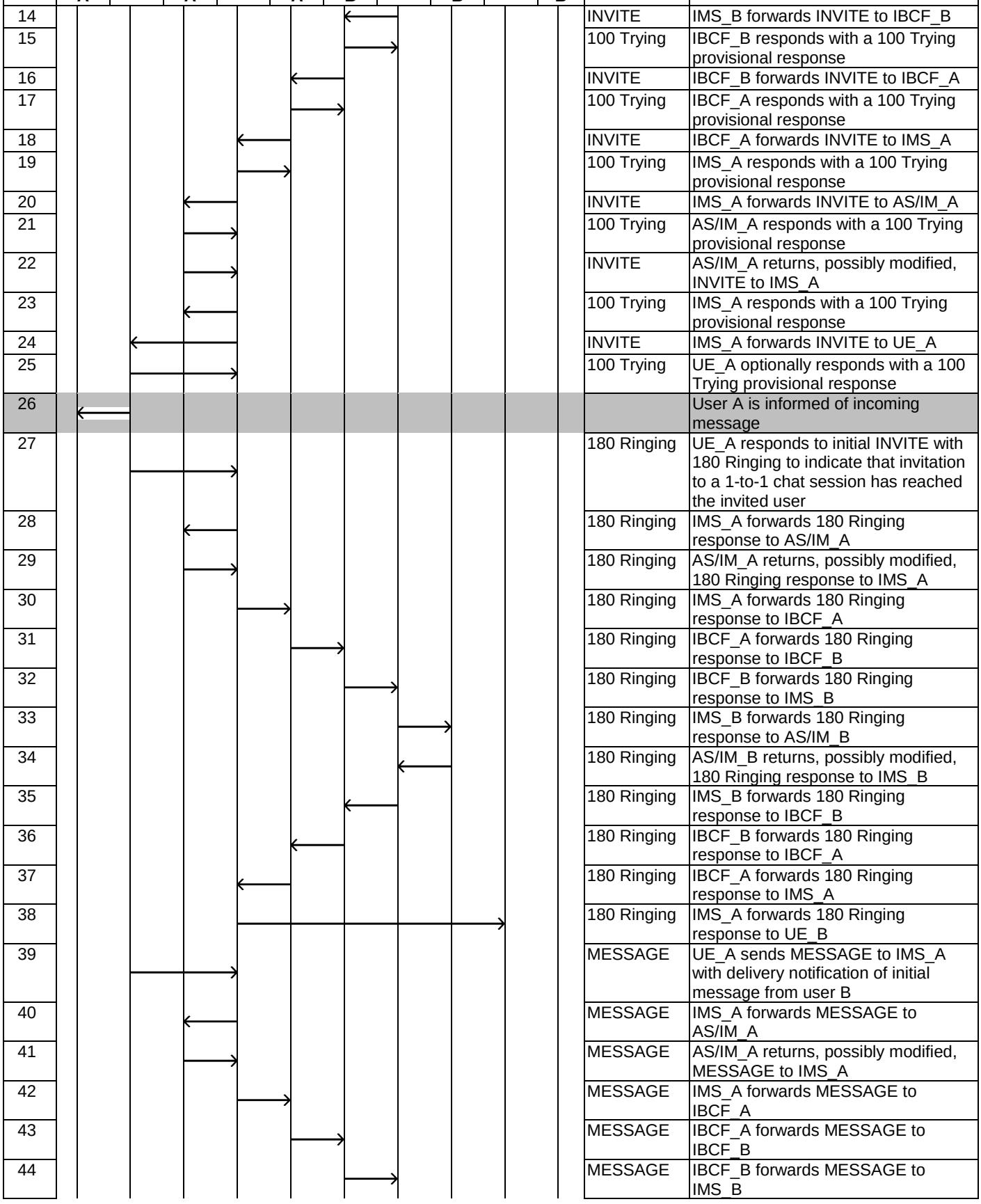
4.4.3.2.2 UC_RCS_4_R: SIP message flow for 1-to-1 chat standard procedure with CF_ROAM_AS

The test sequence typically associated with this use case is as follows (CFW step numbers refer the call flow step numbering):

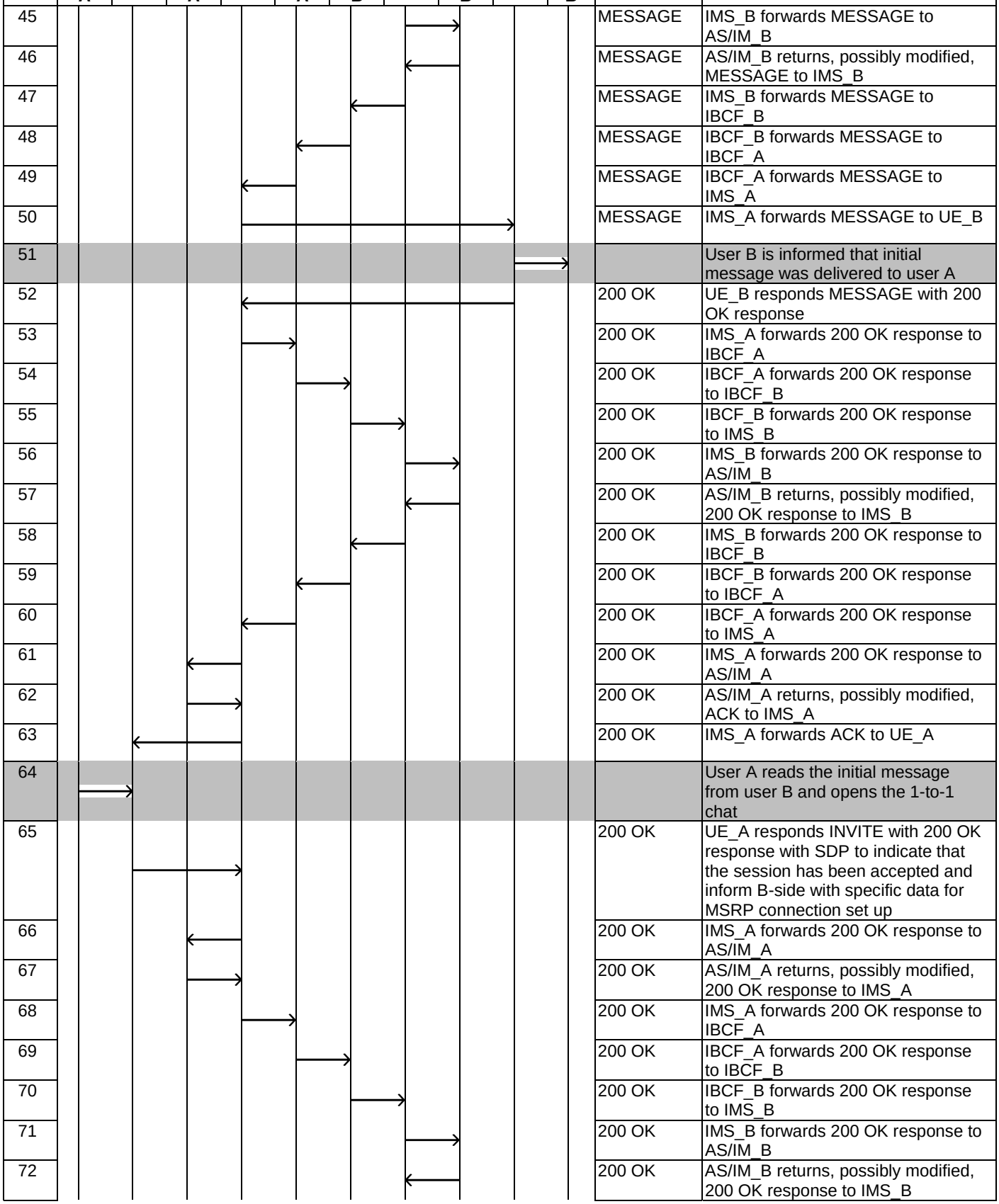
Step	Action	CF_ROAM_AS
1	User B selects User A in the phone address book and sends him an initial message	Step 1
2	User A is informed of incoming message	Step 26
3	User B is informed that initial message was delivered to user A	Step 51
4	User A reads the initial message from user B and opens the 1-to-1 chat	Step 64
5	Users perform chatting	Step 89
6A	User B closes the 1-to-1 chat	Step 90A
6B	User A closes the 1-to-1 chat	Step 90B
7A	User B is informed that that 1-to-1 chat with user A is closed	Step 115A
7B	User A is informed that that 1-to-1 chat with user B is closed	Step 115B

The expected call flow sequence is:

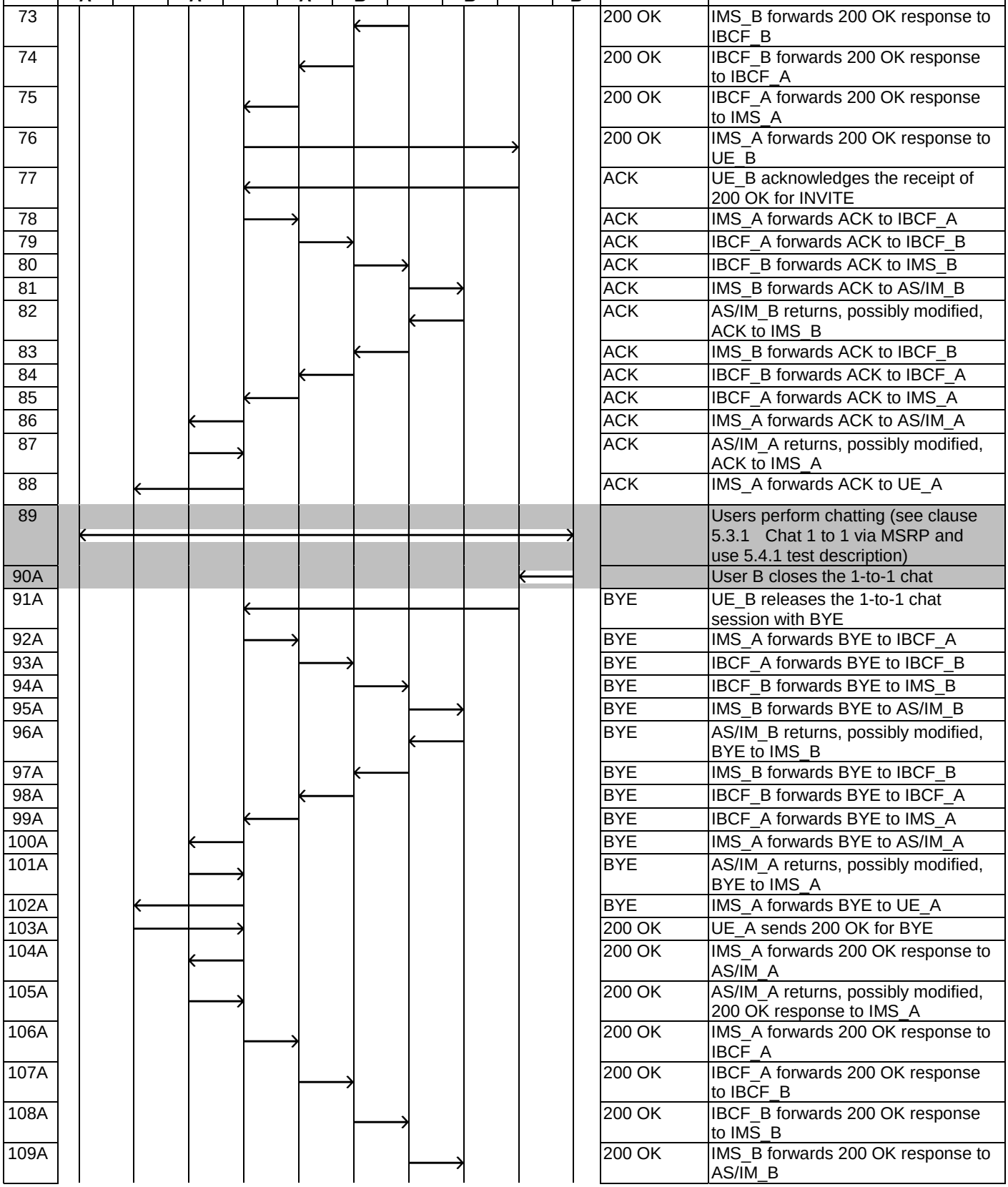
Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
1									←			User B selects User A in the phone address book and sends him an initial message
2				←					←		INVITE	UE_B sends INVITE to IMS_A with user B initial message in the Subject header, CPIM/IMND headers and the first SDP offer indicating all specific data for MSRP connection set up
3				→					→		100 Trying	IMS_A responds with a 100 Trying provisional response
4				→							INVITE	IMS_A forwards INVITE to IBCF_A
5				←							100 Trying	IBCF_A responds with a 100 Trying provisional response
6					→						INVITE	IBCF_A forwards INVITE to IBCF_B
7					←						100 Trying	IBCF_B responds with a 100 Trying provisional response
8						→					INVITE	IBCF_B forwards INVITE to IMS_B
9						←					100 Trying	IMS_B responds with a 100 Trying provisional response
10							→				INVITE	IMS_B forwards INVITE to AS/IM_B
11							←				100 Trying	AS/IM_B responds with a 100 Trying provisional response
12							←				INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
13							→				100 Trying	IMS_B responds with a 100 Trying provisional response



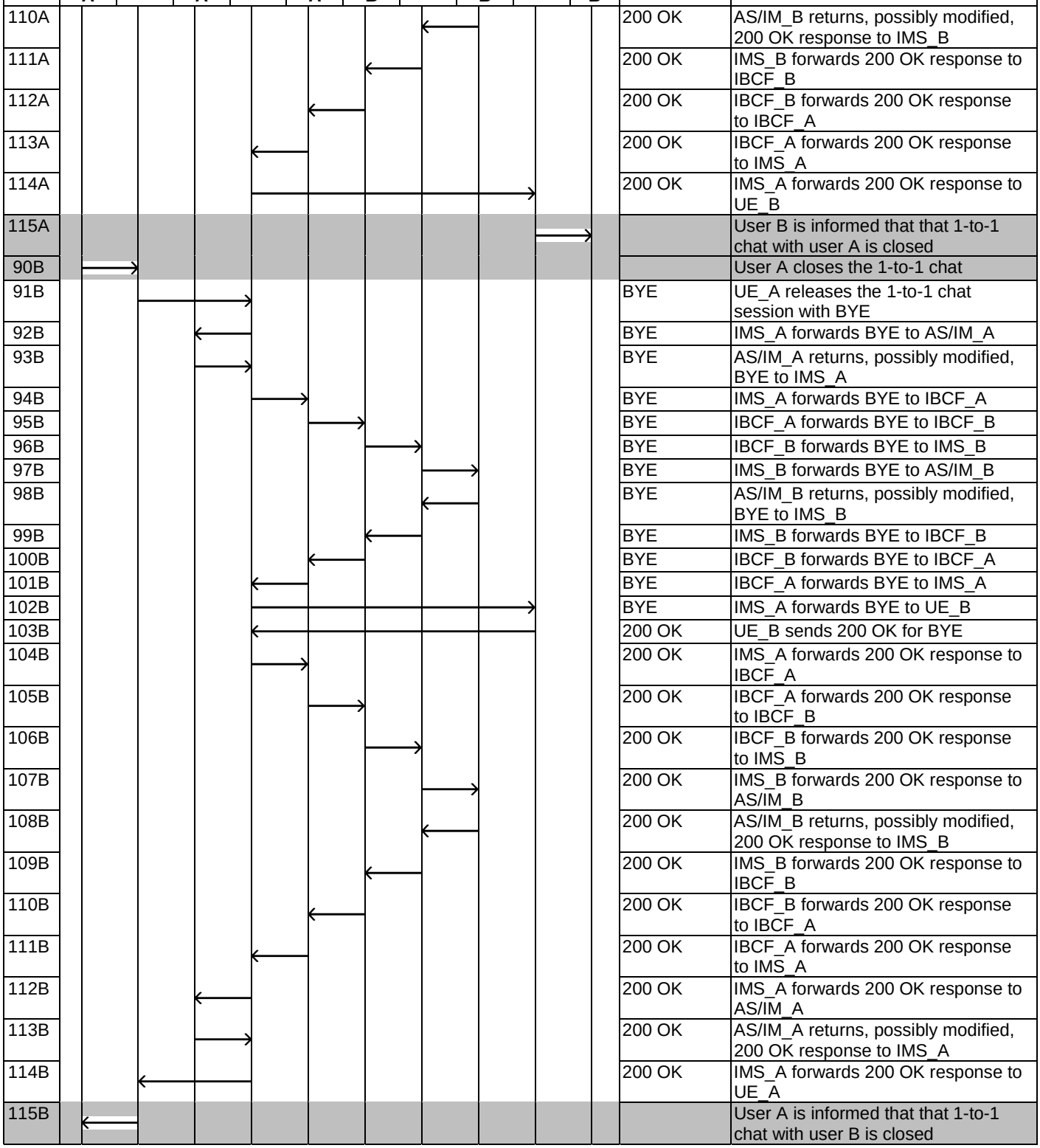
Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
14						←					INVITE	IMS_B forwards INVITE to IBCF_B
15						→					100 Trying	IBCF_B responds with a 100 Trying provisional response
16					←						INVITE	IBCF_B forwards INVITE to IBCF_A
17					→						100 Trying	IBCF_A responds with a 100 Trying provisional response
18				←							INVITE	IBCF_A forwards INVITE to IMS_A
19				→							100 Trying	IMS_A responds with a 100 Trying provisional response
20			←								INVITE	IMS_A forwards INVITE to AS/IM_A
21			→								100 Trying	AS/IM_A responds with a 100 Trying provisional response
22			→								INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
23			←								100 Trying	IMS_A responds with a 100 Trying provisional response
24		←									INVITE	IMS_A forwards INVITE to UE_A
25		→									100 Trying	UE_A optionally responds with a 100 Trying provisional response
26	←											User A is informed of incoming message
27		→									180 Ringing	UE_A responds to initial INVITE with 180 Ringing to indicate that invitation to a 1-to-1 chat session has reached the invited user
28			←								180 Ringing	IMS_A forwards 180 Ringing response to AS/IM_A
29			→								180 Ringing	AS/IM_A returns, possibly modified, 180 Ringing response to IMS_A
30				→							180 Ringing	IMS_A forwards 180 Ringing response to IBCF_A
31					→						180 Ringing	IBCF_A forwards 180 Ringing response to IBCF_B
32						→					180 Ringing	IBCF_B forwards 180 Ringing response to IMS_B
33							→				180 Ringing	IMS_B forwards 180 Ringing response to AS/IM_B
34							←				180 Ringing	AS/IM_B returns, possibly modified, 180 Ringing response to IMS_B
35						←					180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
36					←						180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
37				←							180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
38				→					→		180 Ringing	IMS_A forwards 180 Ringing response to UE_B
39		→									MESSAGE	UE_A sends MESSAGE to IMS_A with delivery notification of initial message from user B
40			←								MESSAGE	IMS_A forwards MESSAGE to AS/IM_A
41			→								MESSAGE	AS/IM_A returns, possibly modified, MESSAGE to IMS_A
42				→							MESSAGE	IMS_A forwards MESSAGE to IBCF_A
43					→						MESSAGE	IBCF_A forwards MESSAGE to IBCF_B
44						→					MESSAGE	IBCF_B forwards MESSAGE to IMS_B



Step	Direction	Message	Comment
	User A / UE A / AS/IM A / IMS A / IBCF A / IBCF B / IMS B / AS/IM B / UE B / User B		
45		MESSAGE	IMS_B forwards MESSAGE to AS/IM_B
46		MESSAGE	AS/IM_B returns, possibly modified, MESSAGE to IMS_B
47		MESSAGE	IMS_B forwards MESSAGE to IBCF_B
48		MESSAGE	IBCF_B forwards MESSAGE to IBCF_A
49		MESSAGE	IBCF_A forwards MESSAGE to IMS_A
50		MESSAGE	IMS_A forwards MESSAGE to UE_B
51			User B is informed that initial message was delivered to user A
52		200 OK	UE_B responds MESSAGE with 200 OK response
53		200 OK	IMS_A forwards 200 OK response to IBCF_A
54		200 OK	IBCF_A forwards 200 OK response to IBCF_B
55		200 OK	IBCF_B forwards 200 OK response to IMS_B
56		200 OK	IMS_B forwards 200 OK response to AS/IM_B
57		200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
58		200 OK	IMS_B forwards 200 OK response to IBCF_B
59		200 OK	IBCF_B forwards 200 OK response to IBCF_A
60		200 OK	IBCF_A forwards 200 OK response to IMS_A
61		200 OK	IMS_A forwards 200 OK response to AS/IM_A
62		200 OK	AS/IM_A returns, possibly modified, ACK to IMS_A
63		200 OK	IMS_A forwards ACK to UE_A
64			User A reads the initial message from user B and opens the 1-to-1 chat
65		200 OK	UE_A responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform B-side with specific data for MSRP connection set up
66		200 OK	IMS_A forwards 200 OK response to AS/IM_A
67		200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
68		200 OK	IMS_A forwards 200 OK response to IBCF_A
69		200 OK	IBCF_A forwards 200 OK response to IBCF_B
70		200 OK	IBCF_B forwards 200 OK response to IMS_B
71		200 OK	IMS_B forwards 200 OK response to AS/IM_B
72		200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
73						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
74					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
75				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
76				→					→		200 OK	IMS_A forwards 200 OK response to UE_B
77				←					←		ACK	UE_B acknowledges the receipt of 200 OK for INVITE
78				→							ACK	IMS_A forwards ACK to IBCF_A
79					→						ACK	IBCF_A forwards ACK to IBCF_B
80						→					ACK	IBCF_B forwards ACK to IMS_B
81							→				ACK	IMS_B forwards ACK to AS/IM_B
82							←				ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
83						←					ACK	IMS_B forwards ACK to IBCF_B
84					←						ACK	IBCF_B forwards ACK to IBCF_A
85				←							ACK	IBCF_A forwards ACK to IMS_A
86			←								ACK	IMS_A forwards ACK to AS/IM_A
87			→								ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
88		←									ACK	IMS_A forwards ACK to UE_A
89	↔									↔		Users perform chatting (see clause 5.3.1 Chat 1 to 1 via MSRP and use 5.4.1 test description)
90A									←			User B closes the 1-to-1 chat
91A				←							BYE	UE_B releases the 1-to-1 chat session with BYE
92A				→							BYE	IMS_A forwards BYE to IBCF_A
93A					→						BYE	IBCF_A forwards BYE to IBCF_B
94A						→					BYE	IBCF_B forwards BYE to IMS_B
95A							→				BYE	IMS_B forwards BYE to AS/IM_B
96A							←				BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
97A						←					BYE	IMS_B forwards BYE to IBCF_B
98A					←						BYE	IBCF_B forwards BYE to IBCF_A
99A				←							BYE	IBCF_A forwards BYE to IMS_A
100A			←								BYE	IMS_A forwards BYE to AS/IM_A
101A			→								BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
102A		←									BYE	IMS_A forwards BYE to UE_A
103A		→									200 OK	UE_A sends 200 OK for BYE
104A			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
105A			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
106A				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
107A					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
108A						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
109A							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B



Step	Direction										Message	Comment
	User A	UE A	AS/IMA	IMS A	IBCF A	IBCF B	IMS B	AS/IMB	UE B	User B		
110A											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
111A											200 OK	IMS_B forwards 200 OK response to IBCF_B
112A											200 OK	IBCF_B forwards 200 OK response to IBCF_A
113A											200 OK	IBCF_A forwards 200 OK response to IMS_A
114A											200 OK	IMS_A forwards 200 OK response to UE_B
115A												User B is informed that that 1-to-1 chat with user A is closed
90B												User A closes the 1-to-1 chat
91B											BYE	UE_A releases the 1-to-1 chat session with BYE
92B											BYE	IMS_A forwards BYE to AS/IM_A
93B											BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
94B											BYE	IMS_A forwards BYE to IBCF_A
95B											BYE	IBCF_A forwards BYE to IBCF_B
96B											BYE	IBCF_B forwards BYE to IMS_B
97B											BYE	IMS_B forwards BYE to AS/IM_B
98B											BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
99B											BYE	IMS_B forwards BYE to IBCF_B
100B											BYE	IBCF_B forwards BYE to IBCF_A
101B											BYE	IBCF_A forwards BYE to IMS_A
102B											BYE	IMS_A forwards BYE to UE_B
103B											200 OK	UE_B sends 200 OK for BYE
104B											200 OK	IMS_A forwards 200 OK response to IBCF_A
105B											200 OK	IBCF_A forwards 200 OK response to IBCF_B
106B											200 OK	IBCF_B forwards 200 OK response to IMS_B
107B											200 OK	IMS_B forwards 200 OK response to AS/IM_B
108B											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
109B											200 OK	IMS_B forwards 200 OK response to IBCF_B
110B											200 OK	IBCF_B forwards 200 OK response to IBCF_A
111B											200 OK	IBCF_A forwards 200 OK response to IMS_A
112B											200 OK	IMS_A forwards 200 OK response to AS/IM_A
113B											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
114B											200 OK	IMS_A forwards 200 OK response to UE_A
115B												User A is informed that that 1-to-1 chat with user B is closed

4.4.3.3 File transfer within 1-to-1 chat

Following there are the expected common call flow sequences for IM/chat service when the incoming one-to-one IM session requests is accepted prior to a FT session occurring.

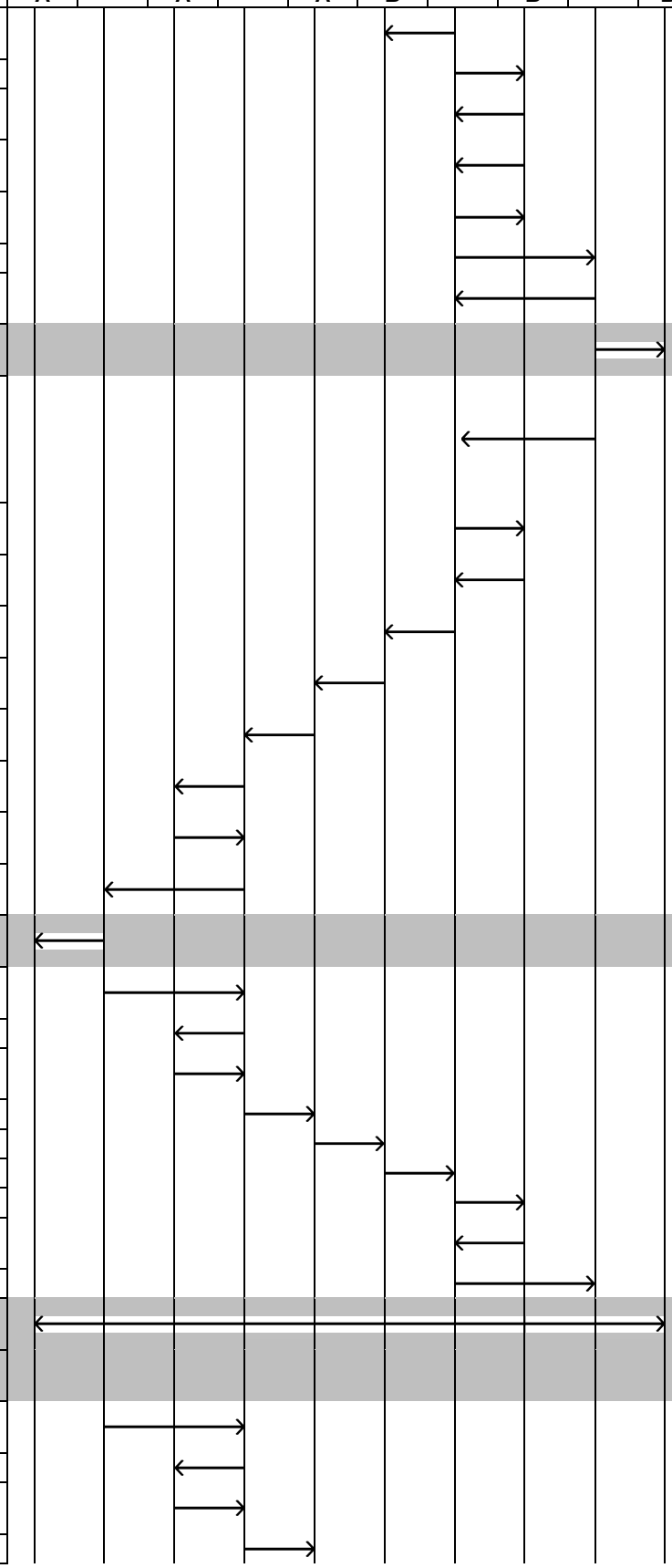
4.4.3.3.1 UC_RCS_5_I: SIP message flow for file transfer within 1-to-1 chat with CF_INT_AS

The test sequence typically associated with this use case is as follows (CFW step numbers refer the call flow step numbering):

Step	Action	CF_INT_AS
1	User A selects User B in the phone address book and sends him an initial message	UC_RCS_4_I Step 1
2	User B is informed of incoming message	UC_RCS_4_I Step 20
3	User A is informed that initial message was delivered to user B	UC_RCS_4_I Step 39
4	User B reads the initial message from user A and opens the 1-to-1 chat	UC_RCS_4_I Step 49
5	Users perform chatting	UC_RCS_4_I Step 68
6	User A initiates a file transfer to user B	Step 2
7	User B is informed of incoming file and accepts the transfer	Step 21
8	User A is informed that file transfer has been accepted by user B	Step 31
9	File transfer starts	Step 41
10	File transfer completed (size checked)	Step 42
11	User B is informed that file transfer completed	Step 52
12	User A is informed that file transfer completed	Step 62
13	Users continue chatting	Step 63
14A	User A closes the 1-to-1 chat	UC_RCS_4_I Step 69A
14B	User B closes the 1-to-1 chat	UC_RCS_4_I Step 69B
15A	User A is informed that 1-to-1 chat with user B is closed	UC_RCS_4_I Step 88A
15B	User B is informed that 1-to-1 chat with user A is closed	UC_RCS_4_I Step 88B

The expected call flow sequence is:

Step	Direction	Message	Comment
	User A / UE A / AS/IM A / IMS A / IBCF A / IBCF B / IMS B / AS/IM B / UE B / User B		
1			Follow UC_RCS_4_I (1-68)
2			User A initiates a file transfer to user B
3		INVITE	UE_A sends INVITE to IMS_A to establish a new session with the SDP offer indicating all specific data for a new MSRP connection set up
4		100 Trying	IMS_A responds with a 100 Trying provisional response
5		INVITE	IMS_A forwards INVITE to AS/IM_A
6		100 Trying	AS/IM_A responds with a 100 Trying provisional response
7		INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
8		100 Trying	IMS_A responds with a 100 Trying provisional response
9		INVITE	IMS_A forwards INVITE to IBCF_A
10		100 Trying	IBCF_A responds with a 100 Trying provisional response
11		INVITE	IBCF_A forwards INVITE to IBCF_B
12		100 Trying	IBCF_B responds with a 100 Trying provisional response
13		INVITE	IBCF_B forwards INVITE to IMS_B



Step	Message	Comment
14	100 Trying	IMS_B responds with a 100 Trying provisional response
15	INVITE	IMS_B forwards INVITE to AS/IM_B
16	100 Trying	AS/IM_B responds with a 100 Trying provisional response
17	INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
18	100 Trying	IMS_B responds with a 100 Trying provisional response
19	INVITE	IMS_B forwards INVITE to UE_B
20	100 Trying	UE_B optionally responds with a 100 Trying provisional response
21		User B is informed of incoming file and accepts the transfer
22	200 OK	UE_B responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform A-side with specific data for a new MSRP connection set up
23	200 OK	IMS_B forwards 200 OK response to AS/IM_B
24	200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
25	200 OK	IMS_B forwards 200 OK response to IBCF_B
26	200 OK	IBCF_B forwards 200 OK response to IBCF_A
27	200 OK	IBCF_A forwards 200 OK response to IMS_A
28	200 OK	IMS_A forwards 200 OK response to AS/IM_A
29	200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
30	200 OK	IMS_A forwards 200 OK response to UE_A
31		User A is informed that file transfer has been accepted by user B
32	ACK	UE_A acknowledges the receipt of 200 OK for INVITE
33	ACK	IMS_A forwards ACK to AS/IM_A
34	ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
35	ACK	IMS_A forwards ACK to IBCF_A
36	ACK	IBCF_A forwards ACK to IBCF_B
37	ACK	IBCF_B forwards ACK to IMS_B
38	ACK	IMS_B forwards ACK to AS/IM_B
39	ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
40	ACK	IMS_B forwards ACK to UE_B
41		File transfer starts (see clause 5.3.3 and use 5.4.1 test description)
42		File transfer completed (size checked)
43	BYE	UE_A releases the file transfer session with BYE
44	BYE	IMS_A forwards BYE to AS/IM_A
45	BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
46	BYE	IMS_A forwards BYE to IBCF_A

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
47											BYE	IBCF_A forwards BYE to IBCF_B
48											BYE	IBCF_B forwards BYE to IMS_B
49											BYE	IMS_B forwards BYE to AS/IM_B
50											BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
51											BYE	IMS_B forwards BYE to UE_B
52												User B is informed that file transfer completed
53											200 OK	UE_B sends 200 OK for BYE
54											200 OK	IMS_B forwards 200 OK response to AS/IM_B
55											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
56											200 OK	IMS_B forwards 200 OK response to IBCF_B
57											200 OK	IBCF_B forwards 200 OK response to IBCF_A
58											200 OK	IBCF_A forwards 200 OK response to IMS_A
59											200 OK	IMS_A forwards 200 OK response to AS/IM_A
60											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
61											200 OK	IMS_A forwards 200 OK response to UE_A
62												User A is informed that file transfer completed
63												Users continue chatting
64												Continue UC_RCS_4_I *(69A-88B)*

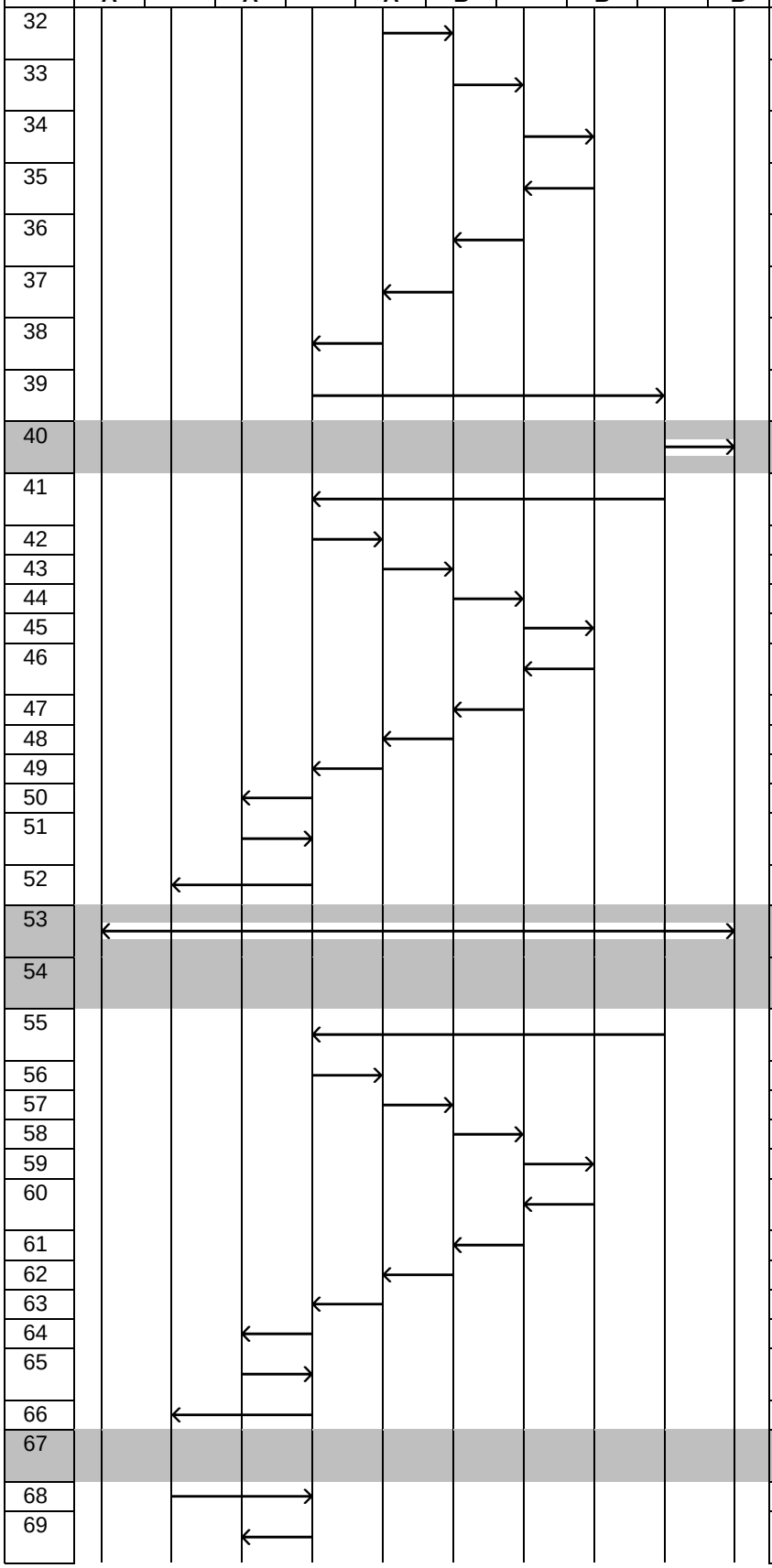
4.4.3.3.2 UC_RCS_5_R: SIP message flow for file transfer within 1-to-1 chat with CF_ROAM_AS

The test sequence typically associated with this use case is as follows (CFW step numbers refer the call flow step numbering):

Step	Action	CF_INT_AS
1	User B selects User A in the phone address book and sends him an initial message	UC_RCS_4_R Step 1
2	User A is informed of incoming message	UC_RCS_4_R Step 26
3	User B is informed that initial message was delivered to user A	UC_RCS_4_R Step 51
4	User A reads the initial message from user B and opens the 1-to-1 chat	UC_RCS_4_R Step 64
5	Users perform chatting	UC_RCS_4_R Step 89
6	User B initiates a file transfer to user A	Step 2
7	User A is informed of incoming file and accepts the transfer	Step 27
8	User B is informed that file transfer has been accepted by user B	Step 40
9	File transfer starts	Step 53
10	File transfer completed (size checked)	Step 54
11	User A is informed that file transfer completed	Step 67
12	User B is informed that file transfer completed	Step 80
13	Users continue chatting	Step 81
14A	User B closes the 1-to-1 chat	UC_RCS_4_R Step 90A
14B	User A closes the 1-to-1 chat	UC_RCS_4_R Step 90B
15A	User B is informed that that 1-to-1 chat with user A is closed	UC_RCS_4_R Step 115A
15B	User A is informed that that 1-to-1 chat with user B is closed	UC_RCS_4_R Step 115B

The expected call flow sequence is:

Step	Direction	Message	Comment
	User A / UE A / AS/IM A / IMS A / IBCF A / IBCF B / IMS B / AS/IM B / UE B / User B		
1			Follow UC_RCS_4_R (1-89)
2	←		User B initiates a file transfer to user A
3	←	INVITE	UE_B sends INVITE to IMS_A to establish a new session with the SDP offer indicating all specific data for a new MSRP connection set up
4	→	100 Trying	IMS_A responds with a 100 Trying provisional response
5	→	INVITE	IMS_A forwards INVITE to IBCF_A
6	←	100 Trying	IBCF_A responds with a 100 Trying provisional response
7	→	INVITE	IBCF_A forwards INVITE to IBCF_B
8	←	100 Trying	IBCF_B responds with a 100 Trying provisional response
9	→	INVITE	IBCF_B forwards INVITE to IMS_B
10	←	100 Trying	IMS_B responds with a 100 Trying provisional response
11	→	INVITE	IMS_B forwards INVITE to AS/IM_B
12	←	100 Trying	AS/IM_B responds with a 100 Trying provisional response
13	←	INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
14	→	100 Trying	IMS_B responds with a 100 Trying provisional response
15	←	INVITE	IMS_B forwards INVITE to IBCF_B
16	→	100 Trying	IBCF_B responds with a 100 Trying provisional response
17	←	INVITE	IBCF_B forwards INVITE to IBCF_A
18	→	100 Trying	IBCF_A responds with a 100 Trying provisional response
19	←	INVITE	IBCF_A forwards INVITE to IMS_A
20	→	100 Trying	IMS_A responds with a 100 Trying provisional response
21	←	INVITE	IMS_A forwards INVITE to AS/IM_A
22	→	100 Trying	AS/IM_A responds with a 100 Trying provisional response
23	→	INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
24	←	100 Trying	IMS_A responds with a 100 Trying provisional response
25	←	INVITE	IMS_A forwards INVITE to UE_A
26	→	100 Trying	UE_A optionally responds with a 100 Trying provisional response
27	←		User A is informed of incoming file and accepts the transfer
28	→	200 OK	UE_A responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform B-side with specific data for a new MSRP connection set up
29	←	200 OK	IMS_A forwards 200 OK response to AS/IM_A
30	→	200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
31	→	200 OK	IMS_A forwards 200 OK response to IBCF_A



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
32					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
33						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
34							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
35							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
36						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
37					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
38				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
39				→					→		200 OK	IMS_A forwards 200 OK response to UE_B
40									→			User B is informed that file transfer has been accepted by user B
41				←					←		ACK	UE_B acknowledges the receipt of 200 OK for INVITE
42				→							ACK	IMS_A forwards ACK to IBCF_A
43					→						ACK	IBCF_A forwards ACK to IBCF_B
44						→					ACK	IBCF_B forwards ACK to IMS_B
45							→				ACK	IMS_B forwards ACK to AS/IM_B
46							←				ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
47						←					ACK	IMS_B forwards ACK to IBCF_B
48					←						ACK	IBCF_B forwards ACK to IBCF_A
49				←							ACK	IBCF_A forwards ACK to IMS_A
50			←								ACK	IMS_A forwards ACK to AS/IM_A
51			→								ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
52		←									ACK	IMS_A forwards ACK to UE_A
53	←									→		File transfer starts (see clause 5.3.3 and use 5.4.1 test description)
54												File transfer completed (size checked)
55				←					←		BYE	UE_B releases the file transfer session with BYE
56				→							BYE	IMS_A forwards BYE to IBCF_A
57					→						BYE	IBCF_A forwards BYE to IBCF_B
58						→					BYE	IBCF_B forwards BYE to IMS_B
59							→				BYE	IMS_B forwards BYE to AS/IM_B
60							←				BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
61						←					BYE	IMS_B forwards BYE to IBCF_B
62					←						BYE	IBCF_B forwards BYE to IBCF_A
63				←							BYE	IBCF_A forwards BYE to IMS_A
64			←								BYE	IMS_A forwards BYE to AS/IM_A
65			→								BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
66		←									BYE	IMS_A forwards BYE to UE_A
67												User A is informed that file transfer completed
68		→									200 OK	UE_A sends 200 OK for BYE
69			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
70			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
71				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
72					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
73						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
74							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
75							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
76						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
77					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
78				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
79				→	→	→	→	→	→		200 OK	IMS_A forwards 200 OK response to UE_B
80									→			User B is informed that file transfer completed
81		←	←	←	←	←	←	←	←			Users continue chatting
82												Continue UC_RCS_4_R (90A-115B)

4.4.3.4 1-to-many chat

4.4.3.4.1 UC_RCS_6_I: SIP message flow for 1-to-many chat with CF_INT_AS

Following there are the expected common call flow sequences for normal procedure of 1-to-many chat. It is assumed that in 1-to-many chat there should be at least one additional user C, but for the clarity in the call flow sequences only two users presented since the message flow for UE_C is the same as for the UE_B.

NOTE 1: In this Use Case AS/IM_A server assumes to be a Controlling IM server for 1-to-many Chat sessions and UE_A should have configured IM CONF-FCTY-URI (conference factory uri).

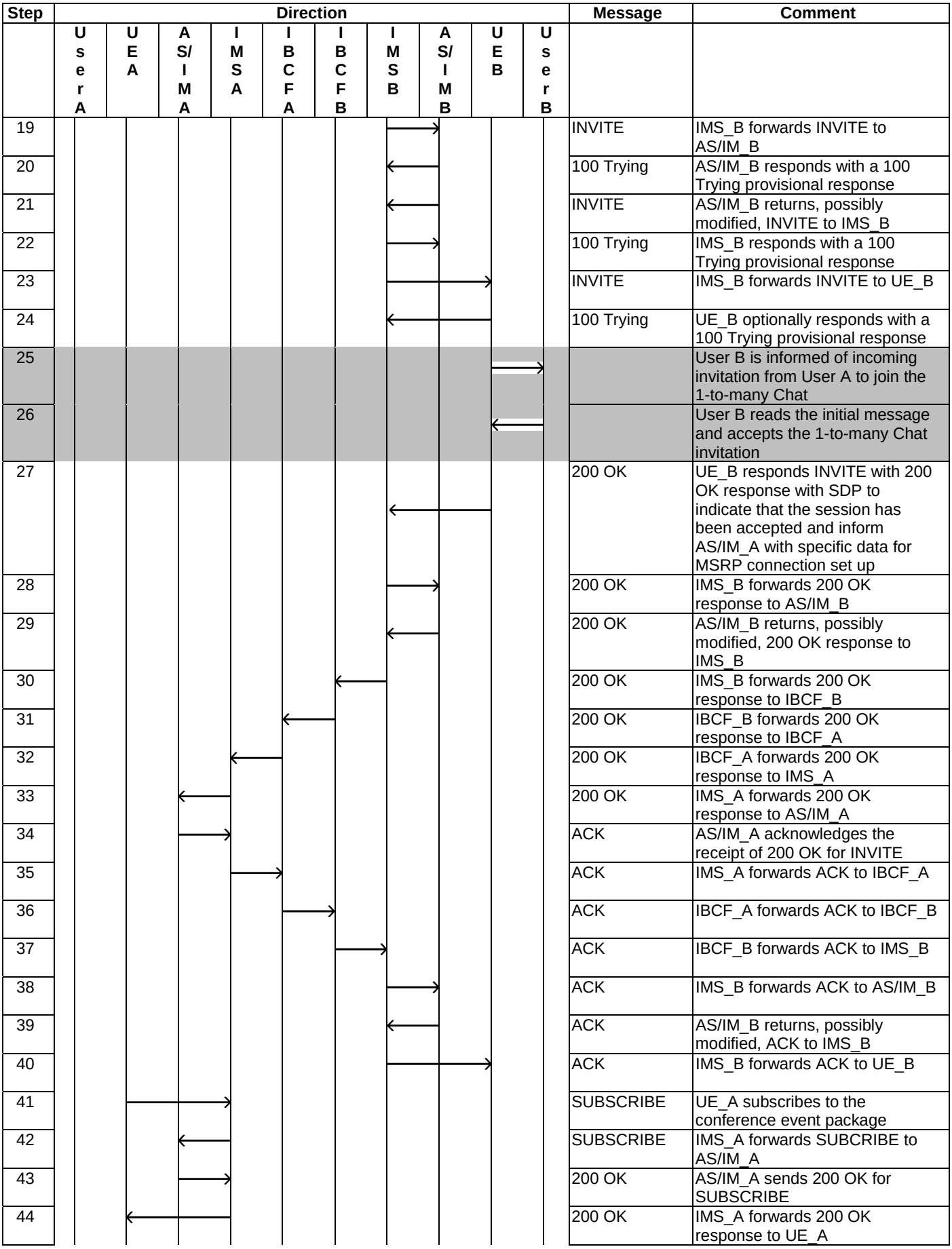
NOTE 2: According to RCS specification [12] delivery and display notifications in 1-to-many Chat are not required and therefore not presented in this Use Case CFW.

The test sequence typically associated with this use case is as follows (CFW step numbers refer the call flow step numbering):

Step	Action	CF_INT_AS
1	User A initiates a 1-to-many Chat with User B and User C by sending initial message	Step 1
2	User A is informed that the 1-to-many Chat is established	Step 8
3	User B is informed of incoming invitation from User A to join the 1-to-many Chat	Step 25
4	User B reads the initial message and accepts the 1-to-many Chat invitation	Step 26
5	User A is notified with list of 1-to-many Chat participants	Step 47
6	User B is notified with list of 1-to-many Chat participants	Step 71
7	Users perform messaging in the 1-to-many Chat	Step 79
8A	User B leaves the 1-to-many Chat	Step 80A
8B	User A leaves the 1-to-many Chat	Step 80B
9A	User B is informed that he has left the 1-to-many Chat	Step 95A
9B	User A is informed that he has left the 1-to-many Chat	Step 85B
10A	User A is notified that all other users have left the 1-to-many Chat	Step 98A
10B	User B is notified that all other users have left the 1-to-many Chat	Step 93B

Step	Action	CF_INT_AS
11A	User A leaves the 1-to-many Chat	Step 101A
11B	User B leaves the 1-to-many Chat	Step 101B
12A	User A is informed that the 1-to-many Chat has ended	Step 106A
12B	User B is informed that the 1-to-many Chat has ended	Step 116B

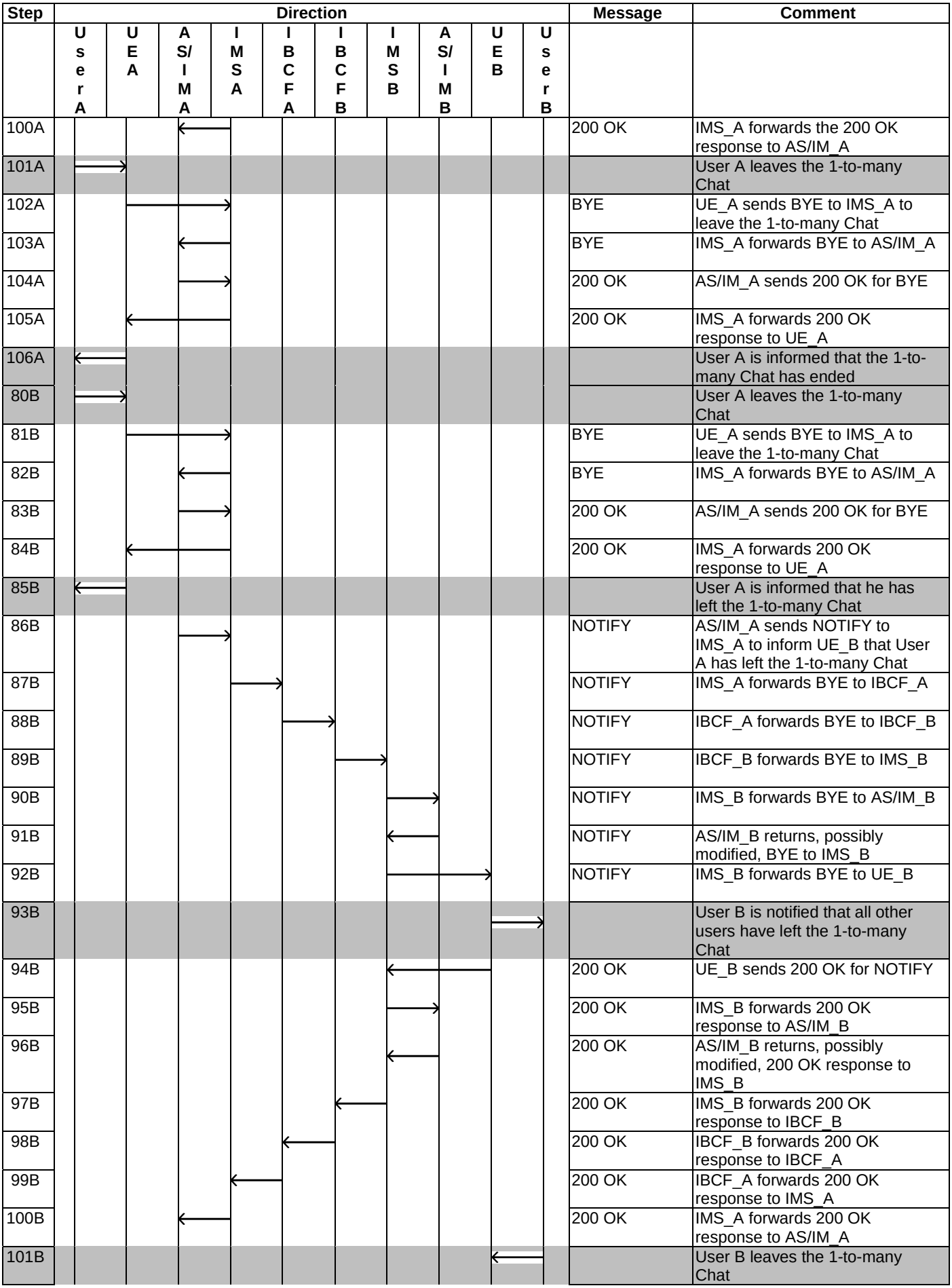
Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
1		→										User A initiates a 1-to-many Chat with User B and User C by sending initial message
2			→	→							INVITE	UE_A sends INVITE to IMS_A with Request-URI set to IM CONF-FCTY-URI (conference factory uri), MIME resource-list body including invited IM Users and the first SDP offer indicating all specific data for MSRP connection set up
3			←	←							100 Trying	IMS_A responds with a 100 Trying provisional response
4				←							INVITE	IMS_A forwards INVITE to AS/IM_A
5				→							100 Trying	AS/IM_A responds with a 100 Trying provisional response
6											200 OK	AS/IM_A responds INVITE with 200 OK response with IM session Identity allocated for the current 1-to-many Chat to indicate that the session has been accepted and SDP to inform A-side with specific data for MSRP connection set up
7			←	←							200 OK	IMS_A forwards 200 OK response to AS/IM_A
8	←	←										User A is informed that the 1-to-many Chat is established
9			→	→							ACK	UE_A acknowledges the receipt of 200 OK for INVITE
10				←							ACK	IMS_A forwards ACK to AS/IM_A
11											INVITE	AS/IM_A sends INVITE to UE_B with IM session identity (allocated for the current 1-to-many Chat) and IM address of the Inviting IM UE (UE_A)
12				←							100 Trying	IMS_A responds with a 100 Trying provisional response
13					→						INVITE	IMS_A forwards INVITE to IBCF_A
14					←						100 Trying	IBCF_A responds with a 100 Trying provisional response
15						→					INVITE	IBCF_A forwards INVITE to IBCF_B
16						←					100 Trying	IBCF_B responds with a 100 Trying provisional response
17							→				INVITE	IBCF_B forwards INVITE to IMS_B
18							←				100 Trying	IMS_B responds with a 100 Trying provisional response



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
19							→	→			INVITE	IMS_B forwards INVITE to AS/IM_B
20							←	←			100 Trying	AS/IM_B responds with a 100 Trying provisional response
21							←	←			INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
22							→	→			100 Trying	IMS_B responds with a 100 Trying provisional response
23							→	→	→		INVITE	IMS_B forwards INVITE to UE_B
24							←	←	←		100 Trying	UE_B optionally responds with a 100 Trying provisional response
25									→	→		User B is informed of incoming invitation from User A to join the 1-to-many Chat
26									←	←		User B reads the initial message and accepts the 1-to-many Chat invitation
27							←	←	←		200 OK	UE_B responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform AS/IM_A with specific data for MSRP connection set up
28							→	→			200 OK	IMS_B forwards 200 OK response to AS/IM_B
29							←	←			200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
30						←	←				200 OK	IMS_B forwards 200 OK response to IBCF_B
31					←	←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
32				←	←						200 OK	IBCF_A forwards 200 OK response to IMS_A
33			←	←							200 OK	IMS_A forwards 200 OK response to AS/IM_A
34			→	→							ACK	AS/IM_A acknowledges the receipt of 200 OK for INVITE
35				→	→						ACK	IMS_A forwards ACK to IBCF_A
36					→	→					ACK	IBCF_A forwards ACK to IBCF_B
37						→	→				ACK	IBCF_B forwards ACK to IMS_B
38							→	→			ACK	IMS_B forwards ACK to AS/IM_B
39							←	←			ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
40							→	→	→		ACK	IMS_B forwards ACK to UE_B
41		→	→	→							SUBSCRIBE	UE_A subscribes to the conference event package
42			←	←							SUBSCRIBE	IMS_A forwards SUBCRIBE to AS/IM_A
43			→	→							200 OK	AS/IM_A sends 200 OK for SUBSCRIBE
44		←	←	←							200 OK	IMS_A forwards 200 OK response to UE_A

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
45			→								NOTIFY	AS/IM_A sends NOTIFY to UE_A with list of 1-to-many Chat participants
46		←									NOTIFY	IMS_A forwards the NOTIFY to UE_A
47	←											User A is notified with list of 1-to-many Chat participants
48		→									200 OK	UE_A responds with 200 OK to IMS_A
49			←								200 OK	IMS_A forwards the 200 OK response to AS/IM_A
50							←				SUBSCRIBE	UE_B subscribes to the conference event package
51							→				SUBSCRIBE	IMS_B forwards SUBSCRIBE to AS/IM_B
52							←				SUBSCRIBE	AS/IM_B returns, possibly modified, SUBSCRIBE to IMS_B
53						←					SUBSCRIBE	IMS_B forwards SUBSCRIBE to IBCF_B
54					←						SUBSCRIBE	IBCF_B forwards SUBSCRIBE to IBCF_A
55				←							SUBSCRIBE	IBCF_A forwards SUBSCRIBE to IMS_A
56			←								SUBSCRIBE	IMS_A forwards SUBSCRIBE to AS/IM_A
57			→								200 OK	AS/IM_A sends 200 OK for SUBSCRIBE
58				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
59					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
60						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
61							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
62							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
63							→				200 OK	IMS_B forwards 200 OK response to UE_B
64			→								NOTIFY	AS/IM_A sends NOTIFY to UE_B with list of 1-to-many Chat participants
65				→							NOTIFY	IMS_A forwards BYE to IBCF_A
66					→						NOTIFY	IBCF_A forwards BYE to IBCF_B
67						→					NOTIFY	IBCF_B forwards BYE to IMS_B
68							→				NOTIFY	IMS_B forwards BYE to AS/IM_B
69							←				NOTIFY	AS/IM_B returns, possibly modified, BYE to IMS_B
70							→				NOTIFY	IMS_B forwards BYE to UE_B
71									→			User B is notified with list of 1-to-many Chat participants
72							←				200 OK	UE_B sends 200 OK for NOTIFY

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
73							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
74							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
75						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
76					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
77				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
78			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
79	↔		↔							↔		Users perform messaging in the 1-to-many Chat (see clause 5.3.2.1Chat 1 to many via MSRP - Interworking and use 5.4.2 test description)
80A									←			User B leaves the 1-to-many Chat
81A							←		←		BYE	UE_B sends BYE to IMS_B to leave the 1-to-many Chat
82A							→				BYE	IMS_B forwards BYE to AS/IM_B
83A							←				BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
84A						←					BYE	IMS_B forwards BYE to IBCF_B
85A					←						BYE	IBCF_B forwards BYE to IBCF_A
86A				←							BYE	IBCF_A forwards BYE to IMS_A
87A			←								BYE	IMS_A forwards BYE to AS/IM_A
88A			→								200 OK	AS/IM_A sends 200 OK for BYE
89A				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
90A					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
91A						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
92A							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
93A							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
94A							→		→		200 OK	IMS_B forwards 200 OK response to UE_B
95A									→			User B is informed that he has left the 1-to-many Chat
96A			→								NOTIFY	AS/IM_A sends NOTIFY to IMS _A to inform UE_A that User B has left the 1-to-many Chat
97A		←									NOTIFY	IMS_A forwards the NOTIFY to UE_A
98A	←											User A is notified that all other users have left the 1-to-many Chat
99A		→	→								200 OK	UE_A responds with 200 OK to IMS_A



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
100A			←								200 OK	IMS_A forwards the 200 OK response to AS/IM_A
101A	→											User A leaves the 1-to-many Chat
102A		→		→							BYE	UE_A sends BYE to IMS_A to leave the 1-to-many Chat
103A			←								BYE	IMS_A forwards BYE to AS/IM_A
104A			→								200 OK	AS/IM_A sends 200 OK for BYE
105A		←									200 OK	IMS_A forwards 200 OK response to UE_A
106A	←											User A is informed that the 1-to-many Chat has ended
80B	→											User A leaves the 1-to-many Chat
81B		→		→							BYE	UE_A sends BYE to IMS_A to leave the 1-to-many Chat
82B			←								BYE	IMS_A forwards BYE to AS/IM_A
83B			→								200 OK	AS/IM_A sends 200 OK for BYE
84B		←									200 OK	IMS_A forwards 200 OK response to UE_A
85B	←											User A is informed that he has left the 1-to-many Chat
86B			→								NOTIFY	AS/IM_A sends NOTIFY to IMS_A to inform UE_B that User A has left the 1-to-many Chat
87B				→							NOTIFY	IMS_A forwards BYE to IBCF_A
88B					→						NOTIFY	IBCF_A forwards BYE to IBCF_B
89B						→					NOTIFY	IBCF_B forwards BYE to IMS_B
90B							→				NOTIFY	IMS_B forwards BYE to AS/IM_B
91B							←				NOTIFY	AS/IM_B returns, possibly modified, BYE to IMS_B
92B							→		→		NOTIFY	IMS_B forwards BYE to UE_B
93B									→			User B is notified that all other users have left the 1-to-many Chat
94B							←		←		200 OK	UE_B sends 200 OK for NOTIFY
95B							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
96B							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
97B						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
98B					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
99B				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
100B			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
101B									←			User B leaves the 1-to-many Chat

Step	Direction										Message	Comment
	User A	UEA	AS/IMA	IMSA	IBCFA	IBCFB	IMSB	AS/IMB	UEB	User B		
102B							←		←		BYE	UE_B sends BYE to IMS_B to leave the 1-to-many Chat
103B							→	←			BYE	IMS_B forwards BYE to AS/IM_B
104B							←				BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
105B						←					BYE	IMS_B forwards BYE to IBCF_B
106B					←						BYE	IBCF_B forwards BYE to IBCF_A
107B				←							BYE	IBCF_A forwards BYE to IMS_A
108B			←								BYE	IMS_A forwards BYE to AS/IM_A
109B			→	←							200 OK	AS/IM_A sends 200 OK for BYE
110B				→	←						200 OK	IMS_A forwards 200 OK response to IBCF_A
111B					→	←					200 OK	IBCF_A forwards 200 OK response to IBCF_B
112B						→	←				200 OK	IBCF_B forwards 200 OK response to IMS_B
113B							→	←			200 OK	IMS_B forwards 200 OK response to AS/IM_B
114B							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
115B							→	→	→		200 OK	IMS_B forwards 200 OK response to UE_B
116B									→			User B is informed that the 1-to-many Chat has ended

NOTE: Steps in above figure with letters A and B are alternative message flows showing UEA and UEB leaving 1-to-many chat respectively.

4.4.3.4.2 UC_RCS_6_R: SIP message flow 1-to-many chat with CF_ROAM_AS

NOTE 1: In this Use Case AS/IM_B server assumes to be a Controlling IM server for 1-to-many Chat sessions and UE_B should have configured IM CONF-FCTY-URI (conference factory uri).

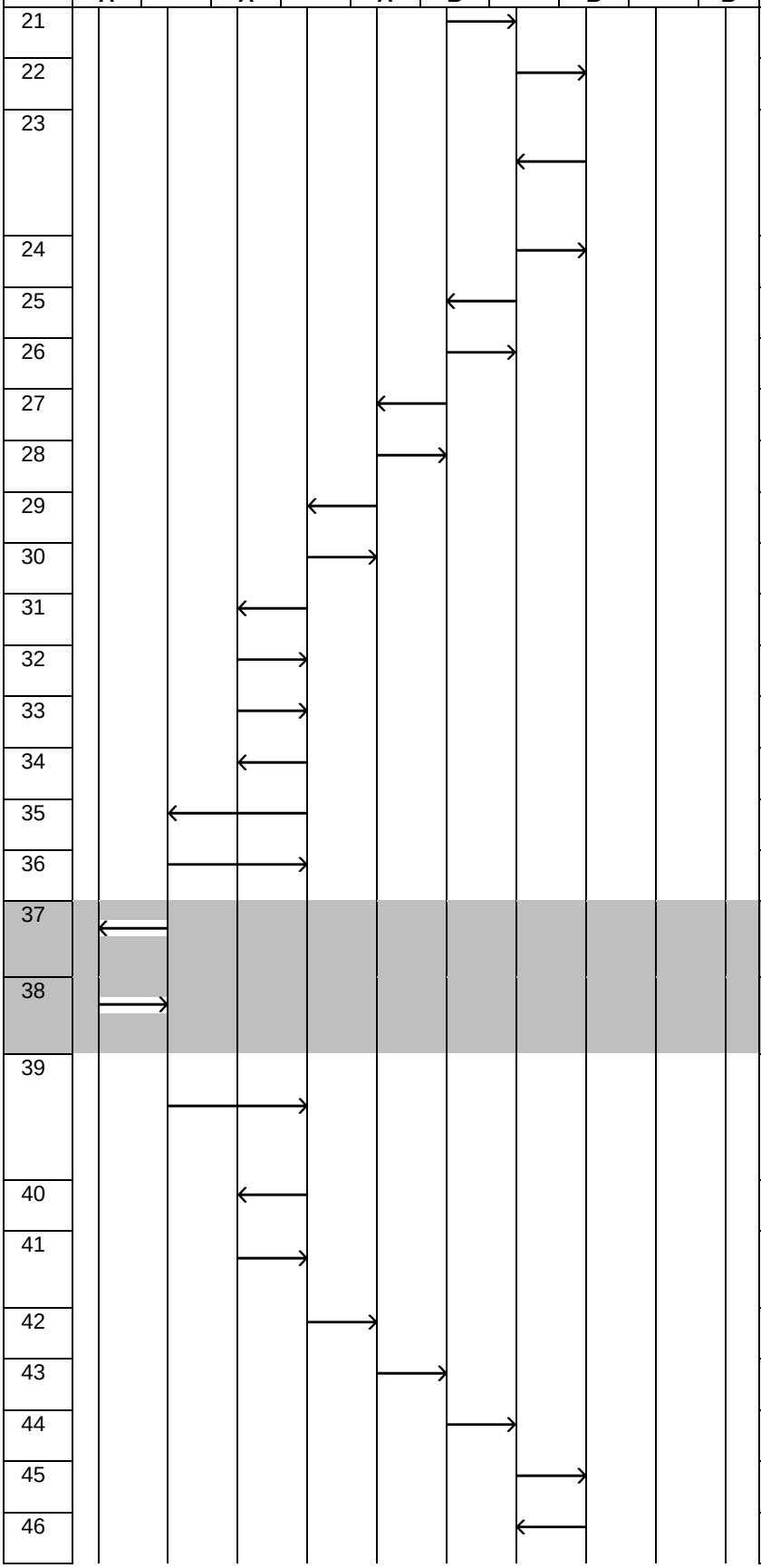
NOTE 2: According to RCS specification [12] delivery and display notifications in 1-to-many Chat are not required and therefore not presented in this Use Case CFW.

The test sequence typically associated with this use case is as follows (CFW step numbers refer the call flow step numbering):

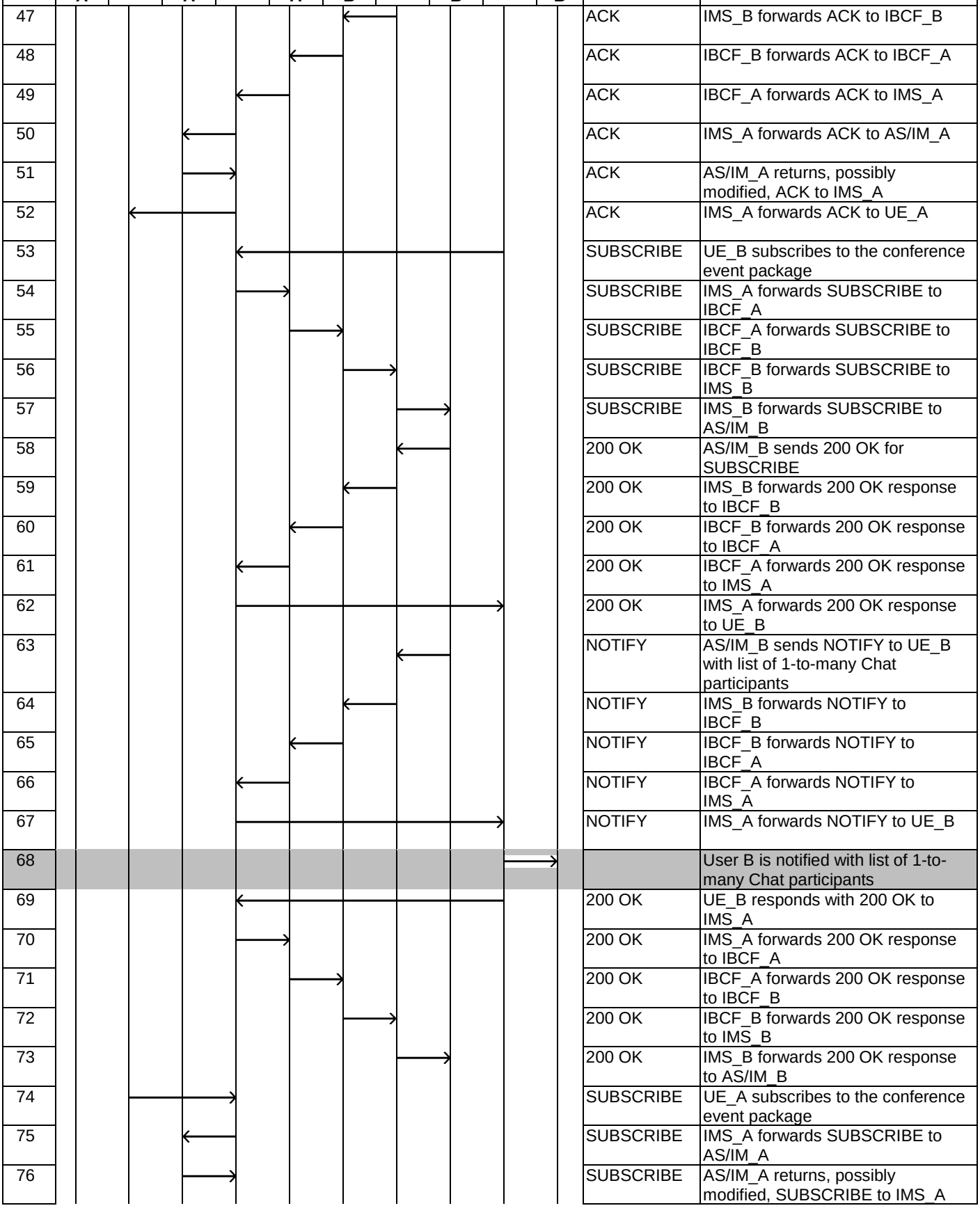
Step	Action	CF_ROAM_AS
1	User B initiates a 1-to-many Chat with User A and User C by sending initial message	Step 1
2	User B is informed that the 1-to-many Chat is established	Step 17
3	User A is informed of incoming invitation from User B to join the 1-to-many Chat	Step 37
4	User A reads the initial message and accepts the 1-to-many Chat invitation	Step 38
5	User B is notified with list of 1-to-many Chat participants	Step 68
6	User A is notified with list of 1-to-many Chat participants	Step 95
7	Users perform messaging in the 1-to-many Chat	Step 103
8A	User A leaves the 1-to-many Chat	Step 104A
8B	User B leaves the 1-to-many Chat	Step 104B
9A	User A is informed that he has left the 1-to-many Chat	Step 119A
9B	User B is informed that he has left the 1-to-many Chat	Step 115B
10A	User B is notified that all other users have left the 1-to-many Chat	Step 125A

Step	Action	CF_ROAM_AS
10B	User A is notified that all other users have left the 1-to-many Chat	Step 123B
11A	User B leaves the 1-to-many Chat	Step 131A
11B	User A leaves the 1-to-many Chat	Step 131B
12A	User B is informed that the 1-to-many Chat has ended	Step 142A
12B	User A is informed that the 1-to-many Chat has ended	Step 146B

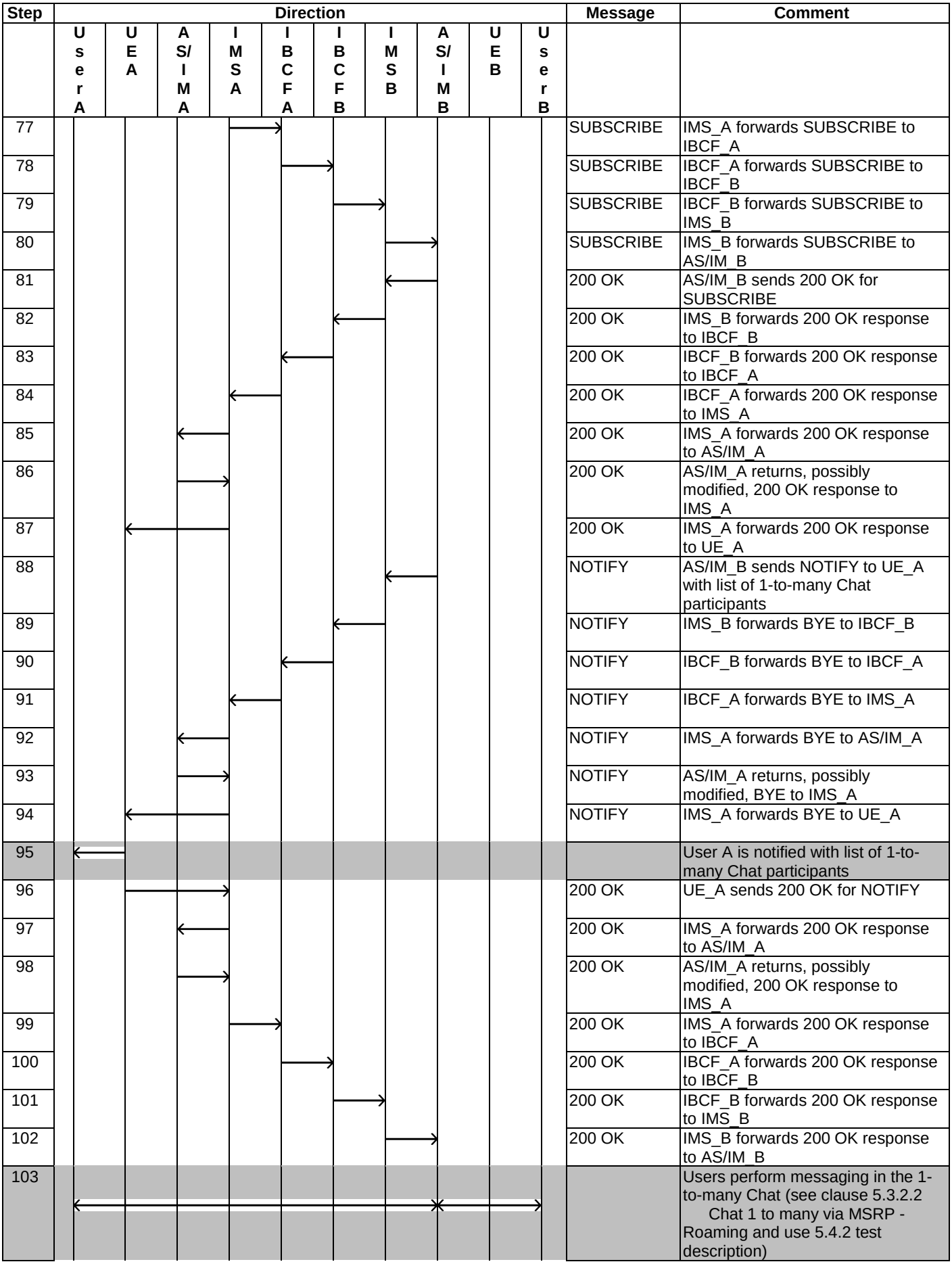
Step	Direction										Message	Comment
	User A	UE A	AS/IMA	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
1									←			User B initiates a 1-to-many Chat with User A and User C by sending initial message
2				←							INVITE	UE_B sends INVITE to IMS_A with Request-URI set to IM CONF-FCTY-URI (conference factory uri), MIME resource-list body including invited IM Users and the first SDP offer indicating all specific data for MSRP connection set up
3				→							100 Trying	IMS_A responds with a 100 Trying provisional response
4				→							INVITE	IMS_A forwards INVITE to IBCF_A
5				←							100 Trying	IBCF_A responds with a 100 Trying provisional response
6					→						INVITE	IBCF_A forwards INVITE to IBCF_B
7					←						100 Trying	IBCF_B responds with a 100 Trying provisional response
8						→					INVITE	IBCF_B forwards INVITE to IMS_B
9						←					100 Trying	IMS_B responds with a 100 Trying provisional response
10							→				INVITE	IMS_B forwards INVITE to AS/IM_B
11							←				100 Trying	AS/IM_B responds with a 100 Trying provisional response
12							←				200 OK	AS/IM_B responds INVITE with 200 OK response with IM session Identity allocated for the current 1-to-many Chat to indicate that the session has been accepted and SDP to inform A-side with specific data for MSRP connection set up
13						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
14					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
15				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
16				→							200 OK	IMS_A forwards 200 OK response to UE_B
17									→			User B is informed that the 1-to-many Chat is established
18				←							ACK	UE_B acknowledges the receipt of 200 OK for INVITE
19				→							ACK	IMS_A forwards ACK to IBCF_A
20					→						ACK	IBCF_A forwards ACK to IBCF_B



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
21						→					ACK	IBCF_B forwards ACK to IMS_B
22							→				ACK	IMS_B forwards ACK to AS/IM_B
23							←				INVITE	AS/IM_B sends INVITE to UE_A with IM session identity (allocated for the current 1-to-many Chat) and IM address of the Inviting IM UE (UE_B)
24							→				100 Trying	IMS_B responds with a 100 Trying provisional response
25						←					INVITE	IMS_B forwards INVITE to IBCF_B
26						→					100 Trying	IBCF_B responds with a 100 Trying provisional response
27					←						INVITE	IBCF_B forwards INVITE to IBCF_A
28					→						100 Trying	IBCF_A responds with a 100 Trying provisional response
29				←							INVITE	IBCF_A forwards INVITE to IMS_A
30				→							100 Trying	IMS_A responds with a 100 Trying provisional response
31			←								INVITE	IMS_A forwards INVITE to AS/IM_A
32			→								100 Trying	AS/IM_A responds with a 100 Trying provisional response
33			→								INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
34			←								100 Trying	IMS_A responds with a 100 Trying provisional response
35		←									INVITE	IMS_A forwards INVITE to UE_A
36		→									100 Trying	UE_A optionally responds with a 100 Trying provisional response
37	←											User A is informed of incoming invitation from User B to join the 1-to-many Chat
38	→											User A reads the initial message and accepts the 1-to-many Chat invitation
39		→									200 OK	UE_A responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform AS/IM_A with specific data for MSRP connection set up
40			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
41			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
42				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
43					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
44						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
45							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
46							←				ACK	AS/IM_B acknowledges the receipt of 200 OK for INVITE



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
47						←					ACK	IMS_B forwards ACK to IBCF_B
48					←						ACK	IBCF_B forwards ACK to IBCF_A
49				←							ACK	IBCF_A forwards ACK to IMS_A
50			←								ACK	IMS_A forwards ACK to AS/IM_A
51			→								ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
52		←									ACK	IMS_A forwards ACK to UE_A
53				←							SUBSCRIBE	UE_B subscribes to the conference event package
54				→							SUBSCRIBE	IMS_A forwards SUBSCRIBE to IBCF_A
55					→						SUBSCRIBE	IBCF_A forwards SUBSCRIBE to IBCF_B
56						→					SUBSCRIBE	IBCF_B forwards SUBSCRIBE to IMS_B
57							→				SUBSCRIBE	IMS_B forwards SUBSCRIBE to AS/IM_B
58							←				200 OK	AS/IM_B sends 200 OK for SUBSCRIBE
59						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
60					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
61				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
62									→		200 OK	IMS_A forwards 200 OK response to UE_B
63							←				NOTIFY	AS/IM_B sends NOTIFY to UE_B with list of 1-to-many Chat participants
64						←					NOTIFY	IMS_B forwards NOTIFY to IBCF_B
65					←						NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
66				←							NOTIFY	IBCF_A forwards NOTIFY to IMS_A
67									→		NOTIFY	IMS_A forwards NOTIFY to UE_B
68										→		User B is notified with list of 1-to-many Chat participants
69				←							200 OK	UE_B responds with 200 OK to IMS_A
70				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
71					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
72						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
73							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
74		→									SUBSCRIBE	UE_A subscribes to the conference event package
75			←								SUBSCRIBE	IMS_A forwards SUBSCRIBE to AS/IM_A
76			→								SUBSCRIBE	AS/IM_A returns, possibly modified, SUBSCRIBE to IMS_A



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
77				→							SUBSCRIBE	IMS_A forwards SUBSCRIBE to IBCF_A
78					→						SUBSCRIBE	IBCF_A forwards SUBSCRIBE to IBCF_B
79						→					SUBSCRIBE	IBCF_B forwards SUBSCRIBE to IMS_B
80							→				SUBSCRIBE	IMS_B forwards SUBSCRIBE to AS/IM_B
81							←				200 OK	AS/IM_B sends 200 OK for SUBSCRIBE
82						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
83					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
84				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
85			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
86			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
87		←									200 OK	IMS_A forwards 200 OK response to UE_A
88							←				NOTIFY	AS/IM_B sends NOTIFY to UE_A with list of 1-to-many Chat participants
89						←					NOTIFY	IMS_B forwards BYE to IBCF_B
90					←						NOTIFY	IBCF_B forwards BYE to IBCF_A
91				←							NOTIFY	IBCF_A forwards BYE to IMS_A
92			←								NOTIFY	IMS_A forwards BYE to AS/IM_A
93			→								NOTIFY	AS/IM_A returns, possibly modified, BYE to IMS_A
94		←									NOTIFY	IMS_A forwards BYE to UE_A
95	←											User A is notified with list of 1-to-many Chat participants
96		→									200 OK	UE_A sends 200 OK for NOTIFY
97			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
98			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
99				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
100					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
101						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
102							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
103	↔							↔		↔		Users perform messaging in the 1-to-many Chat (see clause 5.3.2.2 Chat 1 to many via MSRP - Roaming and use 5.4.2 test description)

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
104A												User A leaves the 1-to-many Chat
105A											BYE	UE_A sends BYE to IMS_A to leave the 1-to-many Chat
106A											BYE	IMS_A forwards BYE to AS/IM_A
107A											BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
108A											BYE	IMS_A forwards BYE to IBCF_A
109A											BYE	IBCF_A forwards BYE to IBCF_B
110A											BYE	IBCF_B forwards BYE to IMS_B
111A											BYE	IMS_B forwards BYE to AS/IM_B
112A											200 OK	AS/IM_B sends 200 OK for BYE
113A											200 OK	IMS_B forwards 200 OK response to IBCF_B
114A											200 OK	IBCF_B forwards 200 OK response to IBCF_A
115A											200 OK	IBCF_A forwards 200 OK response to IMS_A
116A											200 OK	IMS_A forwards 200 OK response to AS/IM_A
117A											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
118A											200 OK	IMS_A forwards 200 OK response to UE_A
119A												User A is informed that he has left the 1-to-many Chat
120A											NOTIFY	AS/IM_B sends NOTIFY to IMS _B to inform UE_B that User A has left the 1-to-many Chat
121A											NOTIFY	IMS_B forwards NOTIFY to IBCF_B
122A											NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
123A											NOTIFY	IBCF_A forwards NOTIFY to IMS_A
124A											NOTIFY	IMS_A forwards NOTIFY to UE_B
125A												User B is notified that all other users have left the 1-to-many Chat
126A											200 OK	UE_B responds with 200 OK to IMS_A
127A											200 OK	IMS_A forwards 200 OK response to IBCF_A
128A											200 OK	IBCF_A forwards 200 OK response to IBCF_B
129A											200 OK	IBCF_B forwards 200 OK response to IMS_B
130A											200 OK	IMS_B forwards 200 OK response to AS/IM_B
131A												User B leaves the 1-to-many Chat
132A											BYE	UE_B sends BYE to IMS_A to leave the 1-to-many Chat

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
133A	→			→							BYE	IMS_A forwards BYE to IBCF_A
134A					→						BYE	IBCF_A forwards BYE to IBCF_B
135A						→					BYE	IBCF_B forwards BYE to IMS_B
136A							→				BYE	IMS_B forwards BYE to AS/IM_B
137A							←				200 OK	AS/IM_B sends 200 OK for BYE
138A						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
139A					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
140A				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
141A				→				→	→		200 OK	IMS_A forwards 200 OK response to UE_B
142A									→			User B is informed that the 1-to-many Chat has ended
104B									←			User B leaves the 1-to-many Chat
105B				←				←	←		BYE	UE_B sends BYE to IMS_A to leave the 1-to-many Chat
106B				→							BYE	IMS_A forwards BYE to IBCF_A
107B					→						BYE	IBCF_A forwards BYE to IBCF_B
108B						→					BYE	IBCF_B forwards BYE to IMS_B
109B							→				BYE	IMS_B forwards BYE to AS/IM_B
110B							←				200 OK	AS/IM_B sends 200 OK for BYE
111B						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
112B					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
113B				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
114B				→				→	→		200 OK	IMS_A forwards 200 OK response to UE_B
115B									→			User B is informed that he has left the 1-to-many Chat
116B							←				NOTIFY	AS/IM_B sends NOTIFY to IMS_B to inform UE_A that User B has left the 1-to-many Chat
117B						←					NOTIFY	IMS_B forwards NOTIFY to IBCF_B
118B					←						NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
119B				←							NOTIFY	IBCF_A forwards NOTIFY to IMS_A
120B			←								NOTIFY	IMS_A forwards NOTIFY to AS/IM_A
121B			→								NOTIFY	AS/IM_A returns, possibly modified, NOTIFY to IMS_A
122B		←									BYE	IMS_A forwards NOTIFY to UE_A
123B	←											User A is informed that User B has left the 1-to-many Chat

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
124B		→	→								200 OK	UE_A sends 200 OK for NOTIFY
125B			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
126B			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
127B				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
128B					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
129B						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
130B							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
131B	→	→										User A leaves the 1-to-many Chat
132B		→	→								BYE	UE_A sends BYE to IMS_A to leave the 1-to-many Chat
133B			←								BYE	IMS_A forwards BYE to AS/IM_A
134B			→								BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
135B				→							BYE	IMS_A forwards BYE to IBCF_A
136B					→						BYE	IBCF_A forwards BYE to IBCF_B
137B						→					BYE	IBCF_B forwards BYE to IMS_B
138B							→				BYE	IMS_B forwards BYE to AS/IM_B
139B							←				200 OK	AS/IM_B sends 200 OK for BYE
140B						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
141B					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
142B				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
143B			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
144B			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
145B		←									200 OK	IMS_A forwards 200 OK response to UE_A
146B	←											User A is informed that the 1-to-many Chat has ended

4.4.3.5 Switching to 1-to-many chat

Following there are the expected common call flow sequences for switching from 1-to-1 chat to 1-to-many chat. Initially, a 1:1 chat is established as shown in UC_RCS_4_I. Subsequently, a chat conference server is invoked and a third user C is added to a group chat via the conference server.

4.4.3.5.1 UC_RCS_7_I: SIP message flow for switching to 1-to-many chat with CF_INT_AS

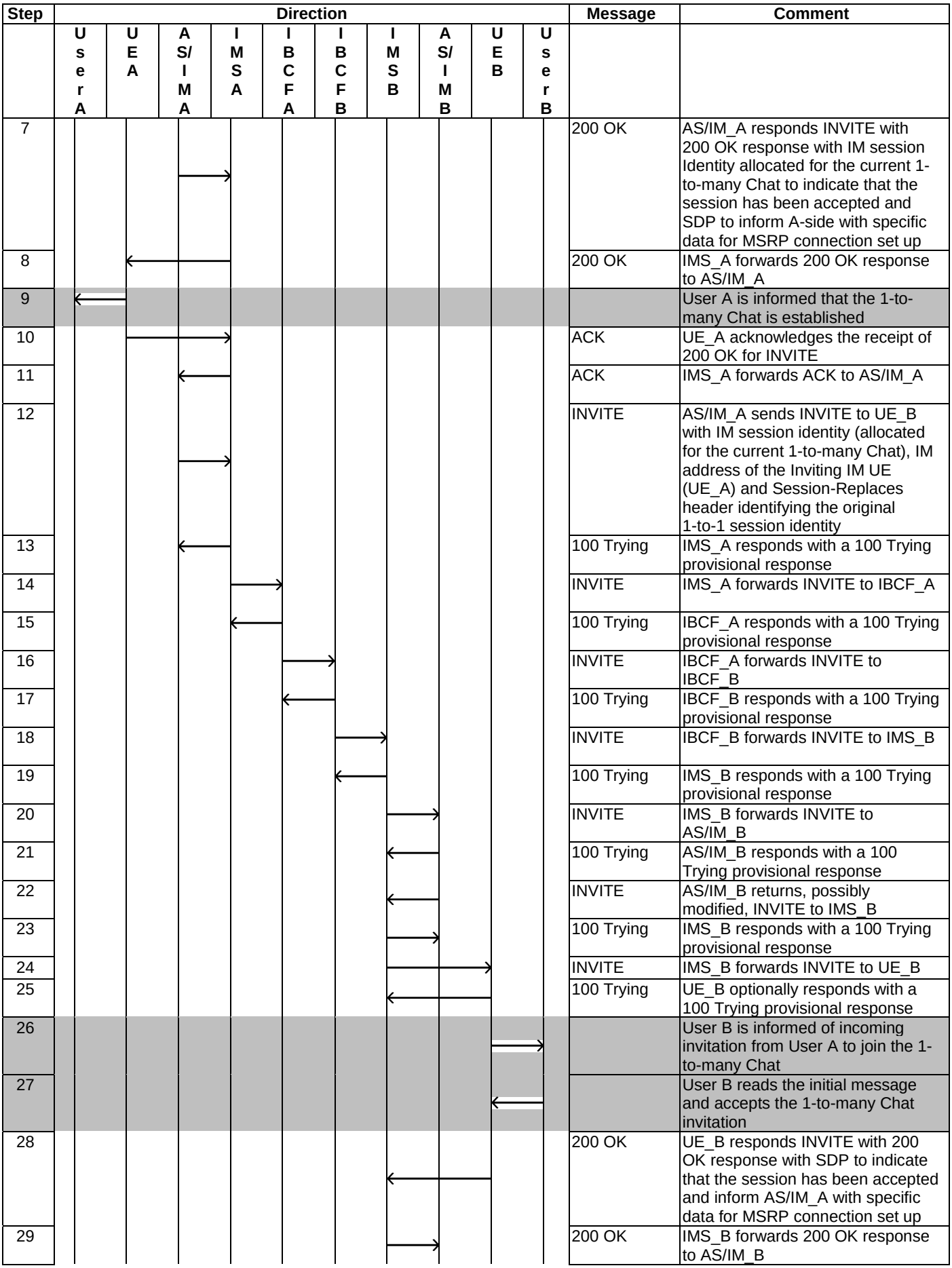
NOTE 1: In this Use Case AS/IM_A server assumes to be a Controlling IM server for 1-to-many Chat sessions and UE_A should have configured IM CONF-FCTY-URI (conference factory uri).

NOTE 2: According to RCS specification [12] delivery and display notifications in 1-to-many Chat are not required and therefore not presented in this Use Case CFW.

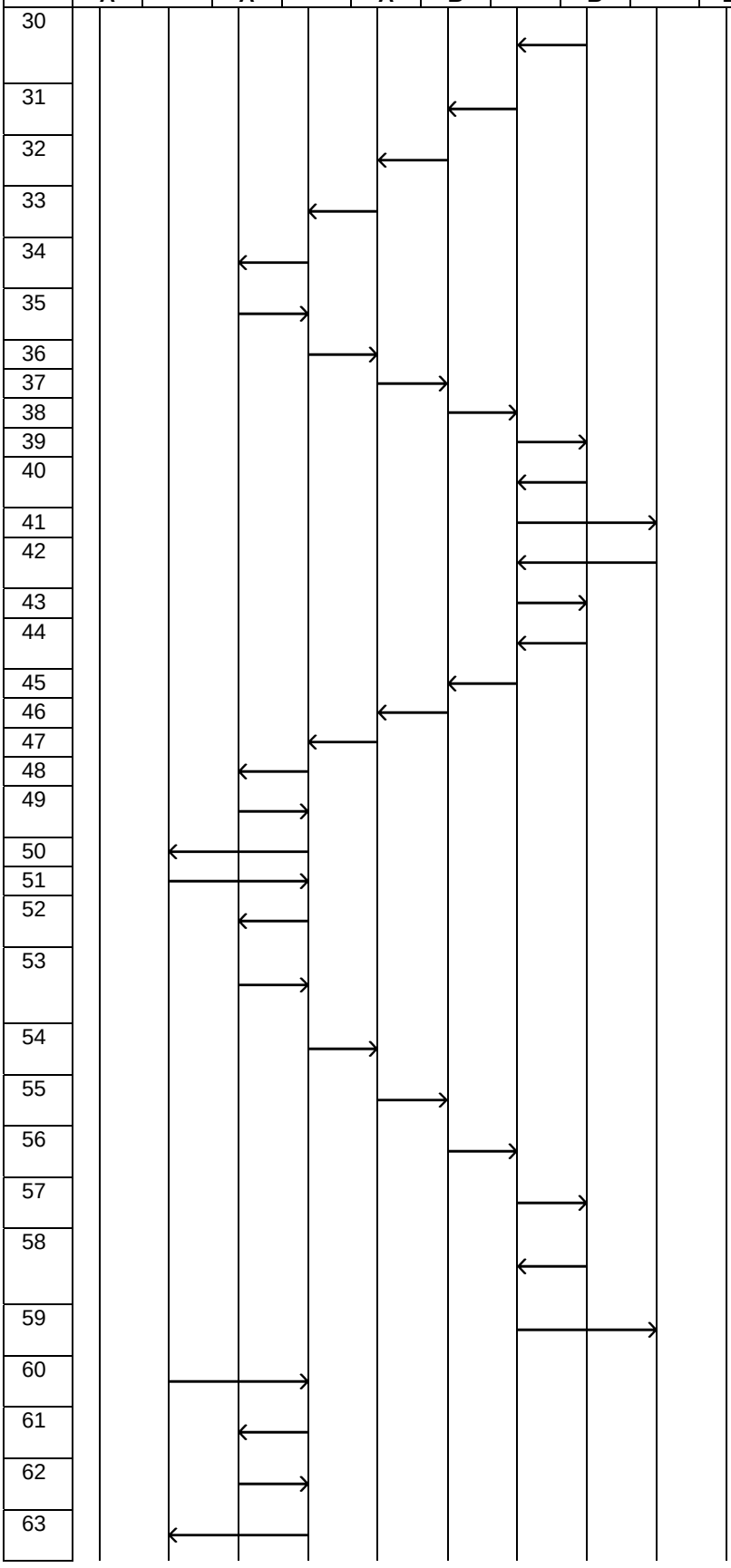
The test sequence typically associated with this use case is as follows (CFW step numbers refer the call flow step numbering):

Step	Action	CF_INT_AS
1	User A selects User B in the phone address book and sends him an initial message	UC_RCS_4_I Step 1
2	User B is informed of incoming message	UC_RCS_4_I Step 20
3	User A is informed that initial message was delivered to user B	UC_RCS_4_I Step 39
4	User B reads the initial message from user A and opens the 1-to-1 chat	UC_RCS_4_I Step 49
5	Users perform 1-to-1 chatting	UC_RCS_4_I Step 68
6	User A initiates a 1-to-many Chat with User B and User C by sending initial message	Step 2
7	User A is informed that the 1-to-many Chat is established	Step 9
8	User B is informed of incoming invitation from User A to join the 1-to-many Chat	Step 26
9	User B reads the initial message and accepts the 1-to-many Chat invitation	Step 27
10	User A is notified with list of 1-to-many Chat participants	Step 66
11	User B is notified with list of 1-to-many Chat participants	Step 90
12	Users perform messaging in the 1-to-many Chat	Step 98
13A	User B leaves the 1-to-many Chat	UC_RCS_6_I Step 80A
13B	User A leaves the 1-to-many Chat	UC_RCS_6_I Step 80B
14A	User B is informed that he has left the 1-to-many Chat	UC_RCS_6_I Step 95A
14B	User A is informed that he has left the 1-to-many Chat	UC_RCS_6_I Step 85B
15A	User A is notified that all other users have left the 1-to-many Chat	UC_RCS_6_I Step 98A
15B	User B is notified that all other users have left the 1-to-many Chat	UC_RCS_6_I Step 93B
16A	User A leaves the 1-to-many Chat	UC_RCS_6_I Step 101A
16B	User B leaves the 1-to-many Chat	UC_RCS_6_I Step 101B
17A	User A is informed that the 1-to-many Chat has ended	UC_RCS_6_I Step 106A
17B	User B is informed that the 1-to-many Chat has ended	UC_RCS_6_I Step 116B

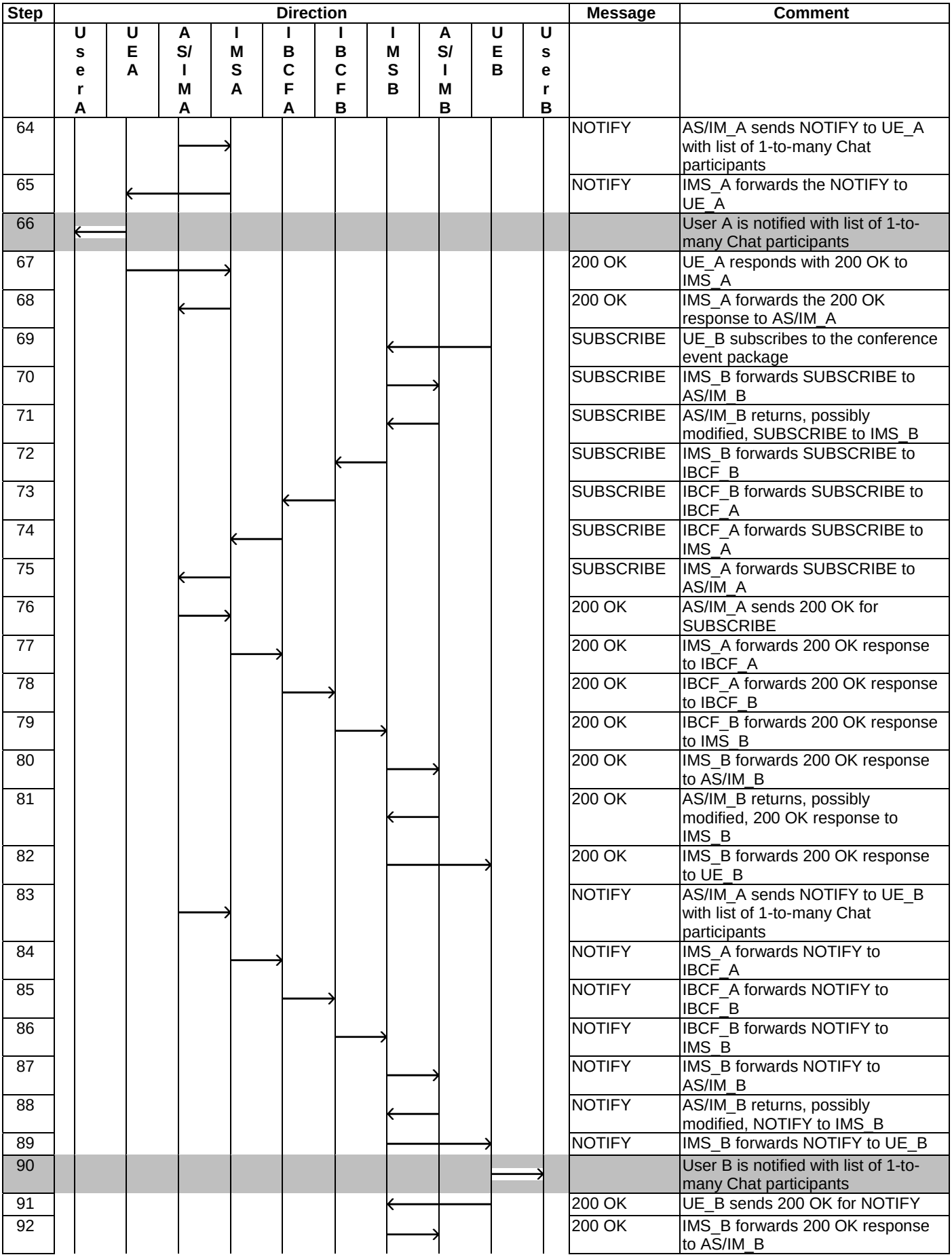
Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
1												Follow UC_RCS_4_I (1-68)
2		→										User A initiates a 1-to-many Chat with User B and User C by sending initial message
3				→							INVITE	UE_A sends INVITE to IMS_A with Request-URI set to IM CONF-FCTY-URI (conference factory uri), MIME resource-list body including invited IM Users, the first SDP offer indicating all specific data for MSRP connection set up and the identity of User B in the Session-Replaces header
4		←									100 Trying	IMS_A responds with a 100 Trying provisional response
5			←								INVITE	IMS_A forwards INVITE to AS/IM_A
6			→								100 Trying	AS/IM_A responds with a 100 Trying provisional response



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
7											200 OK	AS/IM_A responds INVITE with 200 OK response with IM session Identity allocated for the current 1-to-many Chat to indicate that the session has been accepted and SDP to inform A-side with specific data for MSRP connection set up
8											200 OK	IMS_A forwards 200 OK response to AS/IM_A
9												User A is informed that the 1-to-many Chat is established
10											ACK	UE_A acknowledges the receipt of 200 OK for INVITE
11											ACK	IMS_A forwards ACK to AS/IM_A
12											INVITE	AS/IM_A sends INVITE to UE_B with IM session identity (allocated for the current 1-to-many Chat), IM address of the Inviting IM UE (UE_A) and Session-Replaces header identifying the original 1-to-1 session identity
13											100 Trying	IMS_A responds with a 100 Trying provisional response
14											INVITE	IMS_A forwards INVITE to IBCF_A
15											100 Trying	IBCF_A responds with a 100 Trying provisional response
16											INVITE	IBCF_A forwards INVITE to IBCF_B
17											100 Trying	IBCF_B responds with a 100 Trying provisional response
18											INVITE	IBCF_B forwards INVITE to IMS_B
19											100 Trying	IMS_B responds with a 100 Trying provisional response
20											INVITE	IMS_B forwards INVITE to AS/IM_B
21											100 Trying	AS/IM_B responds with a 100 Trying provisional response
22											INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
23											100 Trying	IMS_B responds with a 100 Trying provisional response
24											INVITE	IMS_B forwards INVITE to UE_B
25											100 Trying	UE_B optionally responds with a 100 Trying provisional response
26												User B is informed of incoming invitation from User A to join the 1-to-many Chat
27												User B reads the initial message and accepts the 1-to-many Chat invitation
28											200 OK	UE_B responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform AS/IM_A with specific data for MSRP connection set up
29											200 OK	IMS_B forwards 200 OK response to AS/IM_B



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
30							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
31						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
32					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
33				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
34			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
35			→								ACK	AS/IM_A acknowledges the receipt of 200 OK for INVITE
36				→							ACK	IMS_A forwards ACK to IBCF_A
37					→						ACK	IBCF_A forwards ACK to IBCF_B
38						→					ACK	IBCF_B forwards ACK to IMS_B
39							→				ACK	IMS_B forwards ACK to AS/IM_B
40							←				ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
41							→				ACK	IMS_B forwards ACK to UE_B
42							←				BYE	UE_B releases the 1-to-1 IM session with BYE
43							→				BYE	IMS_B forwards BYE to AS/IM_B
44							←				BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
45						←					BYE	IMS_B forwards BYE to IBCF_B
46					←						BYE	IBCF_B forwards BYE to IBCF_A
47				←							BYE	IBCF_A forwards BYE to IMS_A
48			←								BYE	IMS_A forwards BYE to AS/IM_A
49			→								BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
50		←									BYE	IMS_A forwards BYE to UE_A
51		→									200 OK	UE_A sends 200 OK for BYE
52			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
53			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
54				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
55					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
56						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
57							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
58							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
59							→				200 OK	IMS_B forwards 200 OK response to UE_B
60		→									SUBSCRIBE	UE_A subscribes to the conference event package
61			←								SUBSCRIBE	IMS_A forwards SUBCRIBE to AS/IM_A
62			→								200 OK	AS/IM_A sends 200 OK for SUBSCRIBE
63		←									200 OK	IMS_A forwards 200 OK response to UE_A



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
64											NOTIFY	AS/IM_A sends NOTIFY to UE_A with list of 1-to-many Chat participants
65											NOTIFY	IMS_A forwards the NOTIFY to UE_A
66												User A is notified with list of 1-to-many Chat participants
67											200 OK	UE_A responds with 200 OK to IMS_A
68											200 OK	IMS_A forwards the 200 OK response to AS/IM_A
69											SUBSCRIBE	UE_B subscribes to the conference event package
70											SUBSCRIBE	IMS_B forwards SUBSCRIBE to AS/IM_B
71											SUBSCRIBE	AS/IM_B returns, possibly modified, SUBSCRIBE to IMS_B
72											SUBSCRIBE	IMS_B forwards SUBSCRIBE to IBCF_B
73											SUBSCRIBE	IBCF_B forwards SUBSCRIBE to IBCF_A
74											SUBSCRIBE	IBCF_A forwards SUBSCRIBE to IMS_A
75											SUBSCRIBE	IMS_A forwards SUBSCRIBE to AS/IM_A
76											200 OK	AS/IM_A sends 200 OK for SUBSCRIBE
77											200 OK	IMS_A forwards 200 OK response to IBCF_A
78											200 OK	IBCF_A forwards 200 OK response to IBCF_B
79											200 OK	IBCF_B forwards 200 OK response to IMS_B
80											200 OK	IMS_B forwards 200 OK response to AS/IM_B
81											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
82											200 OK	IMS_B forwards 200 OK response to UE_B
83											NOTIFY	AS/IM_A sends NOTIFY to UE_B with list of 1-to-many Chat participants
84											NOTIFY	IMS_A forwards NOTIFY to IBCF_A
85											NOTIFY	IBCF_A forwards NOTIFY to IBCF_B
86											NOTIFY	IBCF_B forwards NOTIFY to IMS_B
87											NOTIFY	IMS_B forwards NOTIFY to AS/IM_B
88											NOTIFY	AS/IM_B returns, possibly modified, NOTIFY to IMS_B
89											NOTIFY	IMS_B forwards NOTIFY to UE_B
90												User B is notified with list of 1-to-many Chat participants
91											200 OK	UE_B sends 200 OK for NOTIFY
92											200 OK	IMS_B forwards 200 OK response to AS/IM_B

Step	Direction										Message	Comment
	User A	UEA	AS/IMA	IMSA	IBCFA	IBCFB	IMSB	AS/IMB	UEB	User B		
93							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
94						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
95					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
96				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
97			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
98												AS/IM_A sets up a chat session to UE_C as shown in UC_RCS_4_I (i.e. identical to a 1:1 chat session establishment).
99	↔		↔							↔		Users perform messaging in the 1-to-many Chat(see clause 5.3.2.1 Chat 1 to many via MSRP - Interworking and use 5.4.2 test description)
i100												Continue UC_RCS_6_I *(80A-116B)*

4.4.3.5.2 UC_RCS_7_R: SIP message flow for switching to 1-to-many chat with CF_ROAM_AS

NOTE 1: In this Use Case AS/IM_B server assumes to be a Controlling IM server for 1-to-many Chat sessions and UE_B should have configured IM CONF-FCTY-URI (conference factory uri).

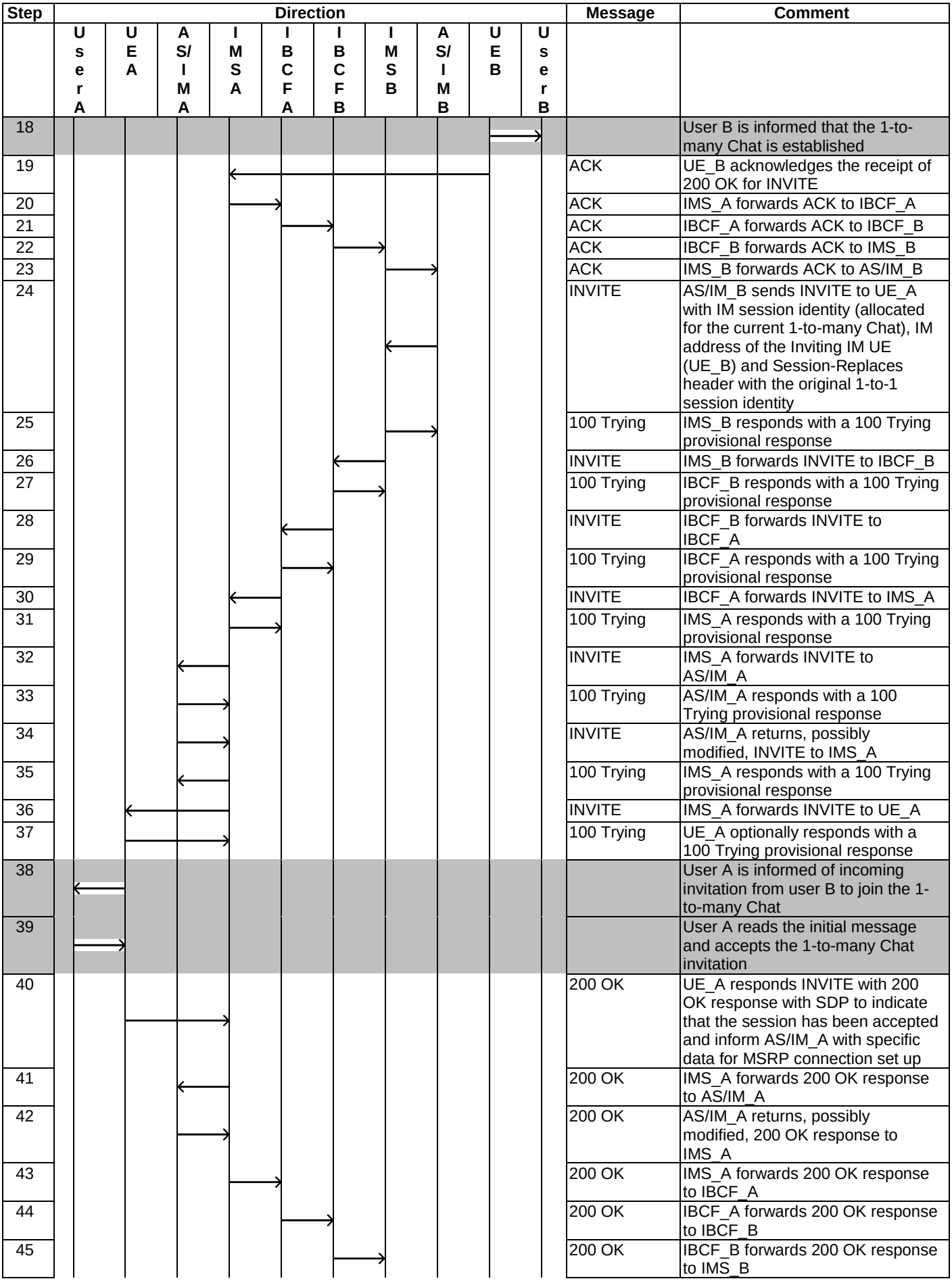
NOTE 2: According to RCS specification [12] delivery and display notifications in 1-to-many Chat are not required and therefore not presented in this Use Case CFW.

The test sequence typically associated with this use case is as follows (CFW step numbers refer the call flow step numbering):

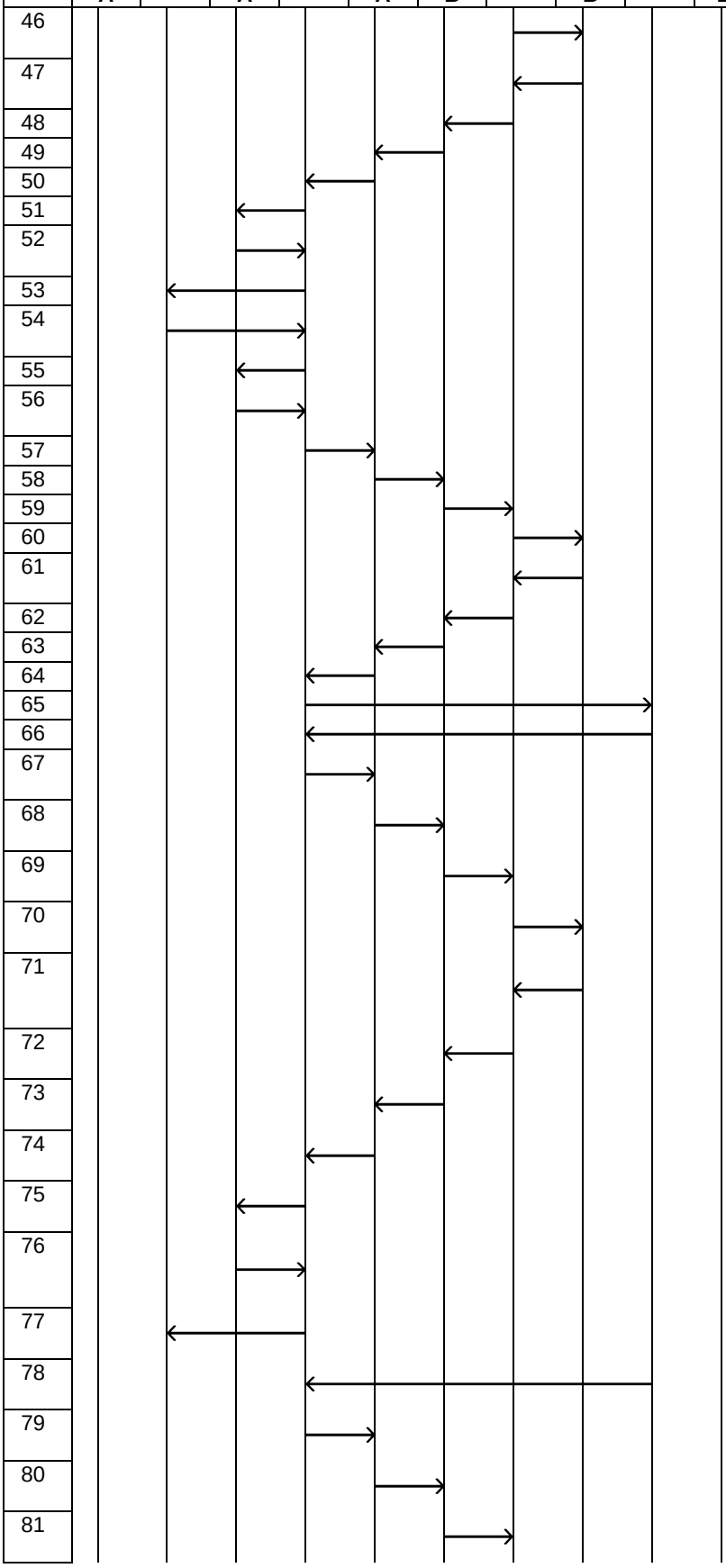
Step	Action	CF_ROAM_AS
1	User B selects User A in the phone address book and sends him an initial message	UC_RCS_4_R Step 1
2	User A is informed of incoming message	UC_RCS_4_R Step 26
3	User B is informed that initial message was delivered to user A	UC_RCS_4_R Step 51
4	User A reads the initial message from user B and opens the 1-to-1 chat	UC_RCS_4_R Step 64
5	Users perform 1-to-1 chatting	UC_RCS_4_R Step 89
6	User B initiates a 1-to-many Chat with User A and User C by sending initial message	Step 2
7	User B is informed that the 1-to-many Chat is established	Step 18
8	User A is informed of incoming invitation from User B to join the 1-to-many Chat	Step 38
9	User A reads the initial message and accepts the 1-to-many Chat invitation	Step 39
10	User B is notified with list of 1-to-many Chat participants	Step 93
11	User A is notified with list of 1-to-many Chat participants	Step 120
12	Users perform messaging in the 1-to-many Chat	Step 128
13A	User A leaves the 1-to-many Chat	UC_RCS_6_R Step 104A
13B	User B leaves the 1-to-many Chat	UC_RCS_6_R Step 104B
14A	User A is informed that he has left the 1-to-many Chat	UC_RCS_6_R Step 119A
14B	User B is informed that he has left the 1-to-many Chat	UC_RCS_6_R Step 115B

Step	Action	CF_ROAM_AS
15A	User B is notified that all other users have left the 1-to-many Chat	UC_RCS_6_R Step 125A
15B	User A is notified that all other users have left the 1-to-many Chat	UC_RCS_6_R Step 123B
16A	User B leaves the 1-to-many Chat	UC_RCS_6_R Step 131A
16B	User A leaves the 1-to-many Chat	UC_RCS_6_R Step 131B
17A	User B is informed that the 1-to-many Chat has ended	UC_RCS_6_R Step 142A
17B	User A is informed that the 1-to-many Chat has ended	UC_RCS_6_R Step 146B

Step	Direction	Message	Comment
	User A / UE A / AS/IMA / IMSA / IBCFA / IBCFB / IMSB / AS/IMB / UE B / User B		
1			Follow UC_RCS_4_R (1-89)
2	UE B →		User B initiates a 1-to-many Chat with User A and User C by sending initial message
3	UE B → IMSA	INVITE	UE_B sends INVITE to IMS_A with Request-URI set to IM CONF-FCTY-URI (conference factory uri), MIME resource-list body including invited IM Users, the first SDP offer indicating all specific data for MSRP connection set up and the identity of User A with Session-Replaces header
4	IMSA → UE B	100 Trying	IMS_A responds with a 100 Trying provisional response
5	IMSA → IBCFA	INVITE	IMS_A forwards INVITE to IBCF_A
6	IBCFA → IMSA	100 Trying	IBCF_A responds with a 100 Trying provisional response
7	IBCFA → IBCFB	INVITE	IBCF_A forwards INVITE to IBCF_B
8	IBCFB → IBCFA	100 Trying	IBCF_B responds with a 100 Trying provisional response
9	IBCFB → IMSB	INVITE	IBCF_B forwards INVITE to IMS_B
10	IMSB → IBCFB	100 Trying	IMS_B responds with a 100 Trying provisional response
11	IMSB → AS/IMB	INVITE	IMS_B forwards INVITE to AS/IM_B
12	AS/IMB → IMSB	100 Trying	AS/IM_B responds with a 100 Trying provisional response
13	AS/IMB → IMSB	200 OK	AS/IM_B responds INVITE with 200 OK response with IM session Identity allocated for the current 1-to-many Chat to indicate that the session has been accepted and SDP to inform A-side with specific data for MSRP connection set up
14	IMSB → IBCFB	200 OK	IMS_B forwards 200 OK response to IBCF_B
15	IBCFB → IBCFA	200 OK	IBCF_B forwards 200 OK response to IBCF_A
16	IBCFA → IMSA	200 OK	IBCF_A forwards 200 OK response to IMS_A
17	IMSA → UE B	200 OK	IMS_A forwards 200 OK response to UE_B

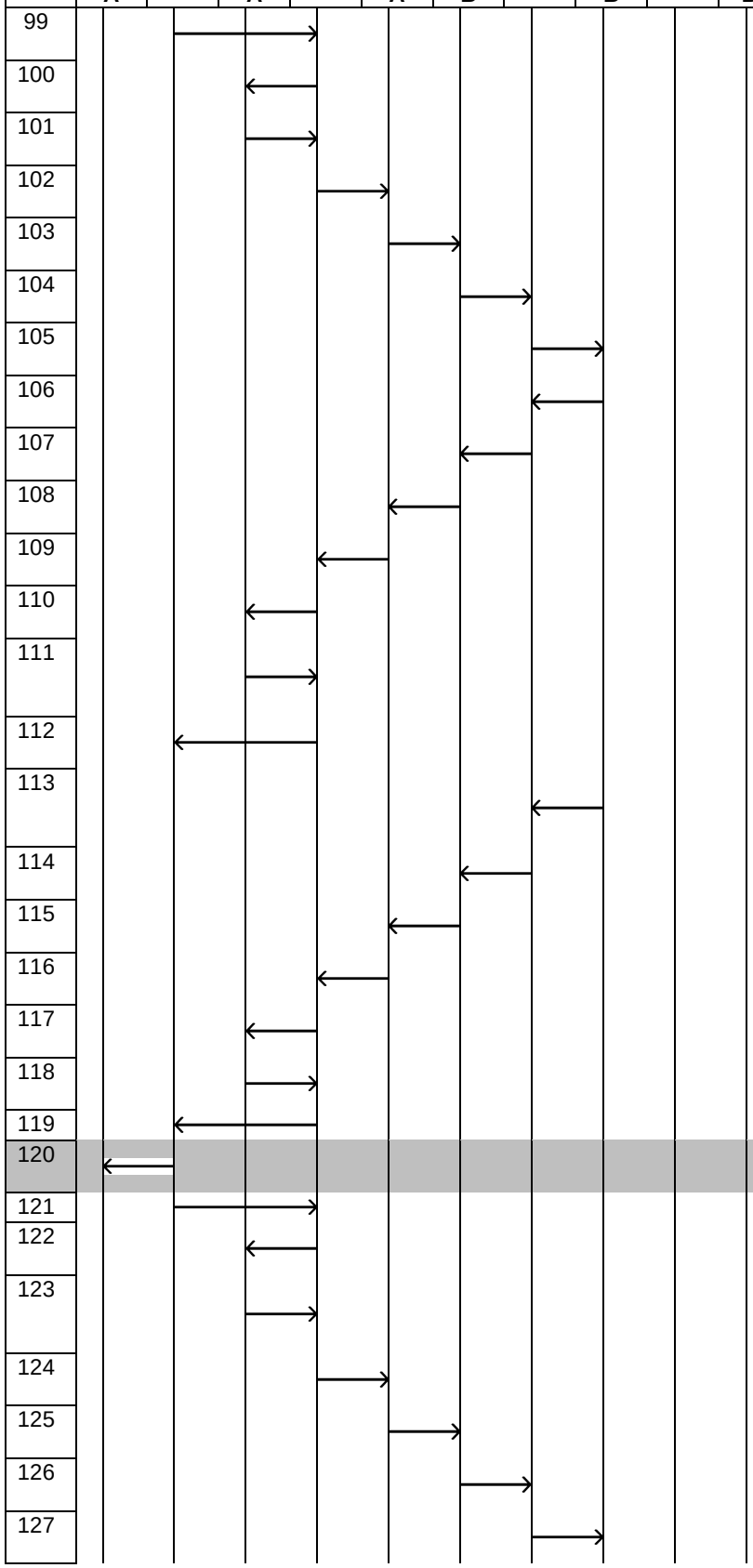


Step	Direction	Message	Comment
	User A / UE A / AS/IM A / IMS A / IBCF A / IBCF B / IMS B / AS/IM B / UE B / User B		
18	UE B → User B		User B is informed that the 1-to-many Chat is established
19	IMS A ← UE B	ACK	UE_B acknowledges the receipt of 200 OK for INVITE
20	IMS A → IBCF A	ACK	IMS_A forwards ACK to IBCF_A
21	IBCF A → IBCF B	ACK	IBCF_A forwards ACK to IBCF_B
22	IBCF B → IMS B	ACK	IBCF_B forwards ACK to IMS_B
23	IMS B → AS/IM B	ACK	IMS_B forwards ACK to AS/IM_B
24	IMS B ← AS/IM B	INVITE	AS/IM_B sends INVITE to UE_A with IM session identity (allocated for the current 1-to-many Chat), IM address of the Inviting IM UE (UE_B) and Session-Replaces header with the original 1-to-1 session identity
25	IMS B → AS/IM B	100 Trying	IMS_B responds with a 100 Trying provisional response
26	IBCF B ← IMS B	INVITE	IMS_B forwards INVITE to IBCF_B
27	IBCF B → IMS B	100 Trying	IBCF_B responds with a 100 Trying provisional response
28	IBCF A ← IBCF B	INVITE	IBCF_B forwards INVITE to IBCF_A
29	IBCF A → IBCF B	100 Trying	IBCF_A responds with a 100 Trying provisional response
30	IMS A ← IBCF A	INVITE	IBCF_A forwards INVITE to IMS_A
31	IMS A → IBCF A	100 Trying	IMS_A responds with a 100 Trying provisional response
32	AS/IM A ← IMS A	INVITE	IMS_A forwards INVITE to AS/IM_A
33	AS/IM A → IMS A	100 Trying	AS/IM_A responds with a 100 Trying provisional response
34	AS/IM A → IMS A	INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
35	AS/IM A ← IMS A	100 Trying	IMS_A responds with a 100 Trying provisional response
36	UE A ← IMS A	INVITE	IMS_A forwards INVITE to UE_A
37	UE A → IMS A	100 Trying	UE_A optionally responds with a 100 Trying provisional response
38	User A ← UE A		User A is informed of incoming invitation from user B to join the 1-to-many Chat
39	User A → UE A		User A reads the initial message and accepts the 1-to-many Chat invitation
40	UE A → IMS A	200 OK	UE_A responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform AS/IM_A with specific data for MSRP connection set up
41	AS/IM A ← IMS A	200 OK	IMS_A forwards 200 OK response to AS/IM_A
42	AS/IM A → IMS A	200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
43	IMS A → IBCF A	200 OK	IMS_A forwards 200 OK response to IBCF_A
44	IBCF A → IBCF B	200 OK	IBCF_A forwards 200 OK response to IBCF_B
45	IBCF B → IMS B	200 OK	IBCF_B forwards 200 OK response to IMS_B



Step	Message	Comment
46	200 OK	IMS_B forwards 200 OK response to AS/IM_B
47	ACK	AS/IM_B acknowledges the receipt of 200 OK for INVITE
48	ACK	IMS_B forwards ACK to IBCF_B
49	ACK	IBCF_B forwards ACK to IBCF_A
50	ACK	IBCF_A forwards ACK to IMS_A
51	ACK	IMS_A forwards ACK to AS/IM_A
52	ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
53	ACK	IMS_A forwards ACK to UE_A
54	BYE	UE_A releases the 1-to-1 IM session with BYE
55	BYE	IMS_A forwards BYE to AS/IM_A
56	BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
57	BYE	IMS_A forwards BYE to IBCF_A
58	BYE	IBCF_A forwards BYE to IBCF_B
59	BYE	IBCF_B forwards BYE to IMS_B
60	BYE	IMS_B forwards BYE to AS/IM_B
61	BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
62	BYE	IMS_B forwards BYE to IBCF_B
63	BYE	IBCF_B forwards BYE to IBCF_A
64	BYE	IBCF_A forwards BYE to IMS_A
65	BYE	IMS_A forwards BYE to UE_B
66	200 OK	UE_B sends 200 OK for BYE
67	200 OK	IMS_A forwards 200 OK response to IBCF_A
68	200 OK	IBCF_A forwards 200 OK response to IBCF_B
69	200 OK	IBCF_B forwards 200 OK response to IMS_B
70	200 OK	IMS_B forwards 200 OK response to AS/IM_B
71	200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
72	200 OK	IMS_B forwards 200 OK response to IBCF_B
73	200 OK	IBCF_B forwards 200 OK response to IBCF_A
74	200 OK	IBCF_A forwards 200 OK response to IMS_A
75	200 OK	IMS_A forwards 200 OK response to AS/IM_A
76	200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
77	200 OK	IMS_A forwards 200 OK response to UE_A
78	SUBSCRIBE	UE_B subscribes to the conference event package
79	SUBSCRIBE	IMS_A forwards SUBSCRIBE to IBCF_A
80	SUBSCRIBE	IBCF_A forwards SUBSCRIBE to IBCF_B
81	SUBSCRIBE	IBCF_B forwards SUBSCRIBE to IMS_B

Step	Direction										Message	Comment
	User A	UE A	AS/IMA	IMSA	IBCFA	IBCFB	IMSB	AS/IMB	UE B	User B		
82							→				SUBSCRIBE	IMS_B forwards SUBSCRIBE to AS/IM_B
83							←				200 OK	AS/IM_B sends 200 OK for SUBSCRIBE
84						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
85					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
86				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
87				→	→	→	→	→	→		200 OK	IMS_A forwards 200 OK response to UE_B
88							←				NOTIFY	AS/IM_B sends NOTIFY to UE_B with list of 1-to-many Chat participants
89						←					NOTIFY	IMS_B forwards NOTIFY to IBCF_B
90					←						NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
91				←							NOTIFY	IBCF_A forwards NOTIFY to IMS_A
92				→	→	→	→	→	→		NOTIFY	IMS_A forwards NOTIFY to UE_B
93									→	→		User B is notified with list of 1-to-many Chat participants
94				←	←	←	←	←	←		200 OK	UE_B responds with 200 OK to IMS_A
95				→	→	→	→	→	→		200 OK	IMS_A forwards 200 OK response to IBCF_A
96					→	→	→	→	→		200 OK	IBCF_A forwards 200 OK response to IBCF_B
97						→	→	→	→		200 OK	IBCF_B forwards 200 OK response to IMS_B
98							→	→	→		200 OK	IMS_B forwards 200 OK response to AS/IM_B



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
99		→	→								SUBSCRIBE	UE_A subscribes to the conference event package
100			←								SUBSCRIBE	IMS_A forwards SUBSCRIBE to AS/IM_A
101			→								SUBSCRIBE	AS/IM_A returns, possibly modified, SUBSCRIBE to IMS_A
102				→							SUBSCRIBE	IMS_A forwards SUBSCRIBE to IBCF_A
103					→						SUBSCRIBE	IBCF_A forwards SUBSCRIBE to IBCF_B
104						→					SUBSCRIBE	IBCF_B forwards SUBSCRIBE to IMS_B
105							→				SUBSCRIBE	IMS_B forwards SUBSCRIBE to AS/IM_B
106							←				200 OK	AS/IM_B sends 200 OK for SUBSCRIBE
107						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
108					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
109				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
110			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
111			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
112		←									200 OK	IMS_A forwards 200 OK response to UE_A
113							←				NOTIFY	AS/IM_B sends NOTIFY to UE_A with list of 1-to-many Chat participants
114						←					NOTIFY	IMS_B forwards NOTIFY to IBCF_B
115					←						NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
116				←							NOTIFY	IBCF_A forwards NOTIFY to IMS_A
117			←								NOTIFY	IMS_A forwards NOTIFY to AS/IM_A
118			→								NOTIFY	AS/IM_A returns, possibly modified, NOTIFY to IMS_A
119		←									NOTIFY	IMS_A forwards NOTIFY to UE_A
120	←											User A is notified with list of 1-to-many Chat participants
121		→	→								200 OK	UE_A sends 200 OK for NOTIFY
122			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
123			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
124				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
125					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
126						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
127							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
128												AS/IM_B sets up a chat session to UE_C as shown in UC_RCS_4_R (i.e. identical to a 1:1 chat session establishment).
129		←						→				Users perform messaging in the 1-to-many Chat (see clause 5.3.2.2 Chat 1 to many via MSRP - Roaming and use 5.4.2 test description)
130												Continue UC_RCS_6_R (104A-146B)

4.4.4 RCS services during a call (In-Call Services)

RCS services during a call include two main types of Content sharing:

- Video sharing;
- Pictures sharing.

The main difference between these types of Content sharing is in the media session protocol. In case of Video sharing users establish RTP media session and for the Pictures sharing purposes MSRP connection is used. Since the call flow sequences for Pictures and Video sharing are similar in the Use Cases below there is only a common procedure of Content sharing described.

It should also be noted that content sharing can also be performed without a parallel voice session. The Use Case of sharing a file (picture) without a parallel voice session is provided in the File transfer service clause 4.4.5. The Use Case of a Video Share without a parallel voice session is identical to a voice session establishment apart from the SDP exchanging video codecs rather than audio codecs for the related RTP flow.

For Use Cases of Content sharing during a call it is assumed that UEs registered on the corresponding IMS networks and they have already performed capability discovery procedures. In particular, users subscribed to RCS services during a call such as video and pictures sharing.

4.4.4.1 Content sharing

4.4.4.1.1 UC_RCS_8_I: SIP message flow for Content sharing with CF_INT_CALL

The test sequence typically associated with this use case is as follows (CFW step numbers refer the call flow step numbering).

Step	Action	CF_INT_CALL
1A	User A establishes voice call with user B	Step 1A
1B	User B establishes voice call with user A	Step 1B
2	User A requests to share content with user B	Step 2
3	User B is requested to accept to share content	Step 13
4	User B accepts to share content with user A	Step 19
5	User A is informed that request has been answered	Step 25
6	Content sharing starts	Step 31
7A	User A ends content sharing	Step 32A
8A	User B is informed that content sharing has terminated	Step 38A
9A	User A is informed that content sharing has terminated	Step 44A
10A	User A initiates voice call termination	Step 55A
7B	User B ends content sharing	Step 32B
8B	User A is informed that content sharing has terminated	Step 38B
9B	User B is informed that content sharing has terminated	Step 44B
10B	User B initiates voice call termination	Step 55B

The expected call flow sequence is:

Step	Direction								Message	Comment
	User A	UE A	IMS A	IBCF A	IBCF B	IMS B	UE B	User B		
1A	←	←	←	←	←	←	←	←		User A establishes a voice call to user B
1B	←	←	←	←	←	←	←	←		User B establishes a voice call to user A
2	→									User A requests to share content with user B
3		→							INVITE	UE_A sends INVITE to share content with user B
4		←							100 Trying	IMS_A responds with a 100 Trying provisional response
5			→						INVITE	IMS_A forwards INVITE to IBCF_A
6			←						100 Trying	IBCF_A responds with a 100 Trying provisional response
7				→					INVITE	IBCF_A forwards INVITE to IBCF_B
8				←					100 Trying	IBCF_B responds with a 100 Trying provisional response
9					→				INVITE	IBCF_B forwards INVITE to IMS_B
10					←				100 Trying	IMS_B responds with a 100 Trying provisional response
11						→			INVITE	IMS_B forwards INVITE to UE_B
12						←			100 Trying	UE_B responds with a 100 Trying provisional response
13							→			User B is requested to accept to share content
14						←			180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting
15					←				180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
16				←					180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
17			←						180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
18		←							180 Ringing	IMS_A forwards the 180 Ringing response to UE_A
19							←			User B accepts to share content
20						←			200 OK	UE_B responds INVITE with 200 OK to indicate that the request has been accepted
21					←				200 OK	IMS_B forwards 200 OK response to IBCF_B
22				←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
23			←						200 OK	IBCF_A forwards 200 OK response to IMS_A
24		←							200 OK	IMS_A forwards 200 OK response to UE_A
25	←									User A is informed that request has been answered
26		→							ACK	UE_A acknowledges the receipt of 200 OK for INVITE
27			→						ACK	IMS_A forwards ACK to IBCF_A
28				→					ACK	IBCF_A forwards ACK to IBCF_B
29					→				ACK	IBCF_B forwards ACK to IMS_B
30						→			ACK	IMS_B forwards ACK to UE_B
31	→	→	→	→	→	→	→	→		Content sharing starts (see clause 5.3.3 Image data via MSRP and use 5.4.3 test description)
32A	→									User A ends content sharing
33A		→							BYE	UE_A releases the call with BYE
34A			→						BYE	IMS_A forwards BYE to IBCF_A
35A				→					BYE	IBCF_A forwards BYE to IBCF_B
36A					→				BYE	IBCF_B forwards BYE to IMS_B
37A						→			BYE	IMS_B forwards BYE to UE_B
38A							→			User B is informed that content sharing has ended
39A						←			200 OK	UE_B sends 200 OK for BYE

Step	Direction								Message	Comment
	User A	UEA	IMSA	IBCFA	IBCFB	IMSB	UEB	User B		
40A					←				200 OK	IMS_B forwards 200 OK response to IBCF_B
41A				←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
42A			←						200 OK	IBCF_A forwards 200 OK response to IMS_A
43A		←							200 OK	IMS_A forwards the 200 OK response to UE_A
44A										User A is informed that content sharing has ended
45A						←			OPTIONS	UE_B sends OPTIONS to IMS_B to verify availability of video sharing capability of the UE_A
46A					←				OPTIONS	IMS_B forwards OPTIONS to IBCF_B
47A				←					OPTIONS	IBCF_B forwards OPTIONS to IBCF_A
48A			←						OPTIONS	IBCF_A forwards OPTIONS to IMS_A
49A		←							OPTIONS	IMS_A forwards OPTIONS to UE_A
50A		→							200 OK	UE_A responds 200 OK to IMS_A with updated capabilities
51A			→						200 OK	IMS_A forwards 200 OK to IBCF_A
52A				→					200 OK	IBCF_A forwards 200 OK to IBCF_B
53A					→				200 OK	IBCF_B forwards 200 OK to IMS_B
54A						→			200 OK	IMS_B forwards 200 OK to UE_B
55A	←							→		Voice call termination initiated by user A
32B							←			User B ends content sharing
33B						←			BYE	UE_B releases the call with BYE
34B					←				BYE	IMS_B forwards BYE to IBCF_B
35B				←					BYE	IBCF_B forwards BYE to IBCF_A
36B			←						BYE	IBCF_A forwards BYE to IMS_A
37B		←							BYE	IMS_A forwards BYE to UE_A
38B	←									User A is informed that content sharing has ended
39B		→							200 OK	UE_A sends 200 OK for BYE
40B			→						200 OK	IMS_A forwards 200 OK response to IBCF_A
41B				→					200 OK	IBCF_A forwards 200 OK response to IBCF_B
42B					→				200 OK	IBCF_B forwards 200 OK response to IMS_B
43B						→			200 OK	IMS_B forwards the 200 OK response to UE_B
44B							→			User B is informed that content sharing has ended
45		→							OPTIONS	UE_A sends OPTIONS to IMS_A to verify availability of video sharing capability of the UE_B
46			→						OPTIONS	IMS_A forwards OPTIONS to IBCF_A
47				→					OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
48					→				OPTIONS	IBCF_B forwards OPTIONS to IMS_B
49						→			OPTIONS	IMS_B forwards OPTIONS to UE_B
50						←			200 OK	UE_B responds with 200 OK to IMS_B with updated capabilities
51					←				200 OK	IMS_B forwards 200 OK to IBCF_B
52				←					200 OK	IBCF_B forwards 200 OK to IBCF_A
53			←						200 OK	IBCF_A forwards 200 OK to IMS_A
54		←							200 OK	IMS_A forwards 200 OK to UE_A
55B										Voice call termination initiated by user B

4.4.4.1.2 UC_RCS_8_R: SIP message flow for Content sharing with CF_ROAM_CALL (OPTIONAL)

The test sequence typically associated with this use case is as follows (CFW step numbers refer the call flow step numbering).

Step	Action	CF_ROAM_CALL
1A	User A establishes voice call with user B	Step 1A
1B	User B establishes voice call with user A	Step 1B
2	User A requests to share content with user B	Step 2
3	User B is requested to accept to share content	Step 19
4	User B accepts to share content with user A	Step 28
5	User A is informed that request has been answered	Step 37
6	Content sharing starts	Step 46
7A	User A ends content sharing	Step 47A
8A	User B is informed that content sharing has terminated	Step 56A
9A	User A is informed that content sharing has terminated	Step 65A
10A	User A initiates voice call termination	Step 82A
7B	User B ends content sharing	Step 47B
8B	User A is informed that content sharing has terminated	Step 56B
9B	User B is informed that content sharing has terminated	Step 65B
10B	User B initiates voice call termination	Step 82B

The expected call flow sequence is:

Step	Direction	Message	Comment
	User A / UE A / IMS A / IBCF A / IBCF B / IMS B / UE B / User B		
1A			User A sets up a voice call to user B
1B			User B sets up a voice call to user A
2			User A requests to share content with user B
3		INVITE	UE_A sends INVITE to share content with user B
4		100 Trying	IMS_A responds with a 100 Trying provisional response
5		INVITE	IMS_A forwards INVITE to IBCF_A
6		100 Trying	IBCF_A responds with a 100 Trying provisional response
7		INVITE	IBCF_A forwards INVITE to IBCF_B
8		100 Trying	IBCF_B responds with a 100 Trying provisional response
9		INVITE	IBCF_B forwards INVITE to IMS_B
10		100 Trying	IMS_B responds with a 100 Trying provisional response
11		INVITE	IMS_B forwards INVITE to IBCF_B
12		100 Trying	IBCF_B responds with a 100 Trying provisional response
13		INVITE	IBCF_B forwards INVITE to IBCF_A
14		100 Trying	IBCF_A responds with a 100 Trying provisional response
15		INVITE	IBCF_A forwards INVITE to IMS_A
16		100 Trying	IMS_A responds with a 100 Trying provisional response
17		INVITE	IMS_A forwards INVITE to UE_B
18		100 Trying	UE_B responds with a 100 Trying provisional response
19			User B is requested to accept to share content
20		180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting
21		180 Ringing	IMS_A forwards 180 Ringing response to IBCF_A

Step	Direction								Message	Comment
	User A	UEA	IMSA	IBCFA	IBCFB	IMSB	UEB	User B		
22					→				180 Ringing	IBCF_A forwards 180 Ringing response to IBCF_B
23						→			180 Ringing	IBCF_B forwards 180 Ringing response to IMS_B
24						←			180 Ringing	IMS_B forwards the 180 Ringing response to IBCF_B
25				←					180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
26			←						180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
27		←							180 Ringing	IMS_A forwards 180 Ringing response to UE_A
28							←			User B accepts to share content
29			←						200 OK	UE_B responds INVITE with 200 OK to indicate that the request has been accepted
30			→						200 OK	IMS_A forwards 200 OK response to IBCF_A
31				→					200 OK	IBCF_A forwards 200 OK response to IBCF_B
32					→				200 OK	IBCF_B forwards 200 OK response to IMS_B
33					←				200 OK	IMS_B forwards 200 OK response to IBCF_B
34				←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
35			←						200 OK	IBCF_A forwards 200 OK response to IMS_A
36		←								IMS_A forwards 200 OK response to UE_A
37	←									User A is informed that request has been answered
38		→							ACK	UE_A acknowledges the receipt of 200 OK for INVITE
39			→						ACK	IMS_A forwards ACK to IBCF_A
40				→					ACK	IBCF_A forwards ACK to IBCF_B
41					→				ACK	IBCF_B forwards ACK to IMS_B
42					←				ACK	IMS_B forwards ACK to IBCF_B
43				←					ACK	IBCF_B forwards ACK to IBCF_A
44			←						ACK	IBCF_A forwards ACK to IMS_A
45			→	→	→		→		ACK	IMS_A forwards ACK to UE_B
46	→		→	→	→		→	→		Content sharing starts (see clause 5.3.3 Image data via MSRP and use 5.4.3 test description)
47A	←		←	←	←		←	→		User A ends content sharing
48A		→							BYE	UE_A releases the call with BYE
49A			→						BYE	IMS_A forwards BYE to IBCF_A
50A				→					BYE	IBCF_A forwards BYE to IBCF_B
51A					→				BYE	IBCF_B forwards BYE to IMS_B
52A					←				BYE	IMS_B forwards BYE to IBCF_B
53A				←					BYE	IBCF_B forwards BYE to IBCF_A
54A			←						BYE	IBCF_A forwards BYE to IMS_A
55A			→	→	→		→		BYE	IMS_A forwards BYE to UE_B
56A							→	→		User B is informed that content sharing has ended
57A			←	←	←		←	←	200 OK	UE_B sends 200 OK for BYE
58A			→	→	→		→	→	200 OK	IMS_A forwards 200 OK response to IBCF_A
59A				→	→	→	→	→	200 OK	IBCF_A forwards 200 OK response to IBCF_B
60A					→	→	→	→	200 OK	IBCF_B forwards 200 OK response to IMS_B
61A					←	←	←	←	200 OK	IMS_B forwards the 200 OK response to IBCF_B
62A				←	←	←	←	←	200 OK	IBCF_B forwards 200 OK response to IBCF_A
63A			←	←	←	←	←	←	200 OK	IBCF_A forwards 200 OK response to IMS_A
64A		←	←	←	←	←	←	←	200 OK	IMS_A forwards the 200 OK response to UE_A
65A										Content sharing terminates

Step	Direction								Message	Comment
	User A	UEA	IMSA	IBCFA	IBCFB	IMSB	UEB	User B		
66A			←						OPTIONS	UE_B sends OPTIONS to IMS_A to verify availability of video sharing capability of the UE_A
67A			→						OPTIONS	IMS_A forwards OPTIONS to IBCF_A
68A				→					OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
69A					→				OPTIONS	IBCF_B forwards OPTIONS to IMS_B
70A					←				OPTIONS	IMS_B forwards OPTIONS to IBCF_B
71A				←					OPTIONS	IBCF_B forwards OPTIONS to IBCF_A
72A			←						OPTIONS	IBCF_A forwards OPTIONS to IMS_A
73A		←							OPTIONS	IMS_A forwards OPTIONS to UE_A
74A		→							200 OK	UE_A responds 200 OK to IMS_A with updated capabilities
75A			→						200 OK	IMS_A forwards 200 OK to IBCF_A
76A				→					200 OK	IBCF_A forwards 200 OK to IBCF_B
77A					→				200 OK	IBCF_B forwards 200 OK to IMS_B
78A					←				200 OK	IMS_B forwards 200 OK to IBCF_B
79A				←					200 OK	IBCF_B forwards 200 OK to IBCF_A
80A			←						200 OK	IBCF_A forwards 200 OK to IMS_A
81A					→				200 OK	IMS_A forwards 200 OK to UE_B
82A										User A terminates voice call
47B										User B ends content sharing
48B			←						BYE	UE_B releases the call with BYE
49B			→						BYE	IMS_A forwards BYE to IBCF_A
50B				→					BYE	IBCF_A forwards BYE to IBCF_B
51B					→				BYE	IBCF_B forwards BYE to IMS_B
52B					←				BYE	IMS_B forwards BYE to IBCF_B
53B				←					BYE	IBCF_B forwards BYE to IBCF_A
54B			←						BYE	IBCF_A forwards BYE to IMS_A
55B		←							BYE	IMS_A forwards BYE to UE_A
56B	←									User A is informed that content sharing has ended
57B		→							200 OK	UE_A sends 200 OK for BYE
58B			→						200 OK	IMS_A forwards 200 OK response to IBCF_A
59B				→					200 OK	IBCF_A forwards 200 OK response to IBCF_B
60B					→				200 OK	IBCF_B forwards 200 OK response to IMS_B
61B					←				200 OK	IMS_B forwards 200 OK response to IBCF_B
62B				←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
63B			←						200 OK	IBCF_A forwards 200 OK response to IMS_A
64B					→				200 OK	IMS_A forwards the 200 OK response to UE_B
65B	←							→		Content sharing terminates
66B		→							OPTIONS	UE_A sends OPTIONS to IMS_A to verify availability of video sharing capability of the UE_B
67B			→						OPTIONS	IMS_A forwards OPTIONS to IBCF_A
68B				→					OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
69B					→				OPTIONS	IBCF_B forwards OPTIONS to IMS_B
70B					←				OPTIONS	IMS_B forwards OPTIONS to IBCF_B
71B				←					OPTIONS	IBCF_B forwards OPTIONS to IBCF_A
72B			←						OPTIONS	IBCF_A forwards OPTIONS to IMS_A
73B					→				OPTIONS	IMS_A forwards OPTIONS to UE_B
74B			←						200 OK	UE_B responds with 200 OK to IMS_A with updated capabilities
75B			→						200 OK	IMS_A forwards 200 OK to IBCF_A
76B				→					200 OK	IBCF_A forwards 200 OK to IBCF_B
77B					→				200 OK	IBCF_B forwards 200 OK to IMS_B

Step	Direction								Message	Comment
	User A	UEA	IMSA	IBCFA	IBCFB	IMSB	UEB	User B		
78B					←				200 OK	IMS_B forwards 200 OK to IBCF_B
79B				←					200 OK	IBCF_B forwards 200 OK to IBCF_A
80B			←						200 OK	IBCF_A forwards 200 OK to IMS_A
81B		←							200 OK	IMS_A forwards 200 OK to UE_A
82B	←							→		User B terminates voice call

4.4.5 File transfer service

Following there are the expected common call flow sequences for a standalone File transfer service.

For all Use Cases it is assumed that UEs registered on the corresponding IMS networks and they have already performed capability discovery procedures. In particular, users subscribed to standalone File transfer service.

NOTE: According to RCS specification [12] File Transfer is a standalone service. In the mean time sharing picture during a call from the 'Media gallery' of the user terminal or file transfer during 1-to-1 chat ultimately equals to File transfer service procedures from a call flow sequences point of view.

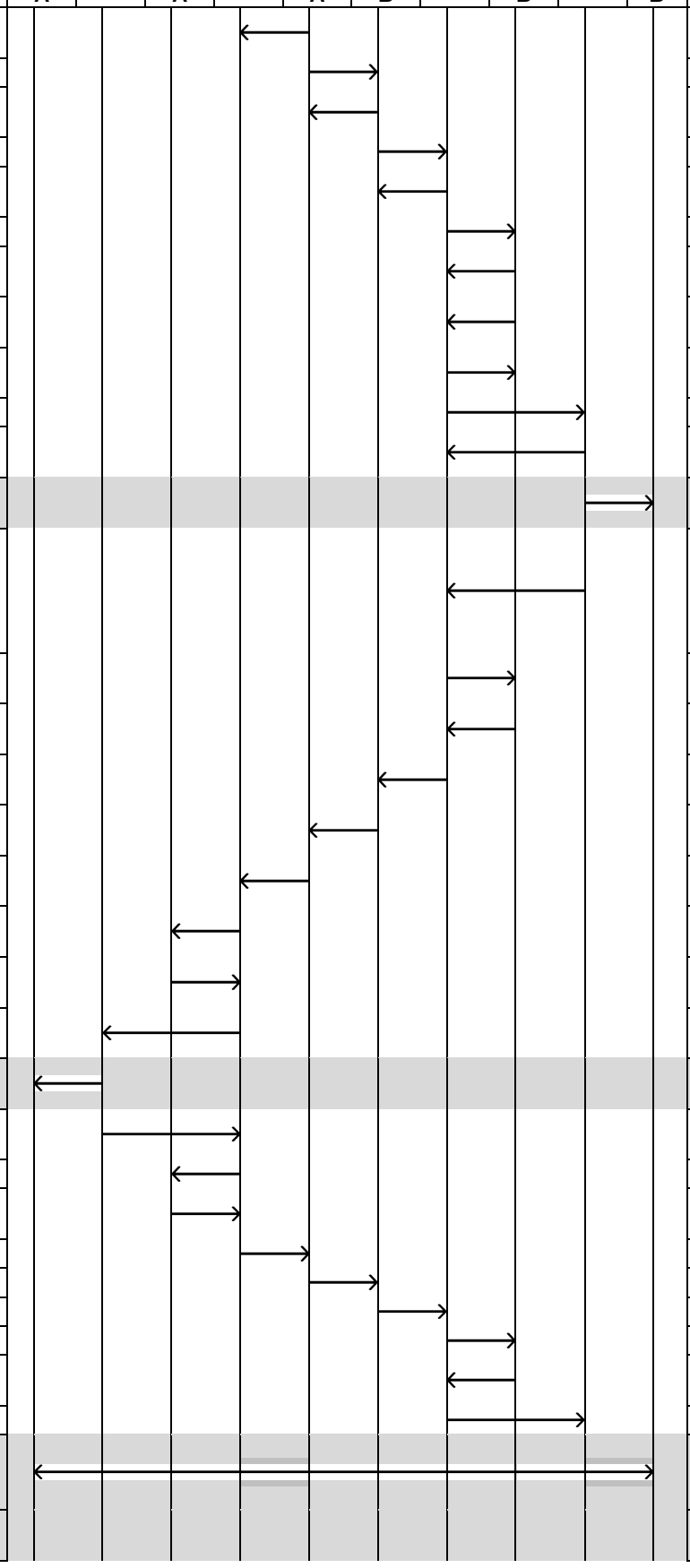
4.4.5.1 UC_RCS_9_I: SIP message flow for File transfer with CF_INT_AS

The test sequence typically associated with this use case is as follows (CFW step numbers refer the call flow step numbering):

Step	Action	CF_INT_AS
1	User A initiates a file transfer to user B	Step 1
2	User B is informed of incoming file and accepts the transfer	Step 20
3	User A is informed that file transfer has been accepted by user B	Step 30
4	File transfer starts	Step 40
5	File transfer completed (size checked)	Step 41
6	User B is informed that file transfer completed	Step 51
7	User A is informed that file transfer completed	Step 61

The expected call flow sequence is:

Step	Direction										Message	Comment
	User A	UEA	AS/IMA	IMSA	IBCFA	IBCFB	IMSB	AS/IMB	UEB	User B		
1	→											User A initiates a file transfer to user B
2		→		→							INVITE	UE_A sends INVITE to IMS_A to establish a session with the SDP offer indicating all specific data for a MSRP connection set up
3		←		←							100 Trying	IMS_A responds with a 100 Trying provisional response
4			←	←							INVITE	IMS_A forwards INVITE to AS/IM_A
5			→	→							100 Trying	AS/IM_A responds with a 100 Trying provisional response
6			→	→							INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
7			←	←							100 Trying	IMS_A responds with a 100 Trying provisional response
8				→	→						INVITE	IMS_A forwards INVITE to IBCF_A



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
9				←	←						100 Trying	IBCF_A responds with a 100 Trying provisional response
10					→	→					INVITE	IBCF_A forwards INVITE to IBCF_B
11					←	←					100 Trying	IBCF_B responds with a 100 Trying provisional response
12						→	→				INVITE	IBCF_B forwards INVITE to IMS_B
13						←	←				100 Trying	IMS_B responds with a 100 Trying provisional response
14							→	→			INVITE	IMS_B forwards INVITE to AS/IM_B
15							←	←			100 Trying	AS/IM_B responds with a 100 Trying provisional response
16							←	←			INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
17							→	→			100 Trying	IMS_B responds with a 100 Trying provisional response
18							→	→	→		INVITE	IMS_B forwards INVITE to UE_B
19							←	←	←		100 Trying	UE_B optionally responds with a 100 Trying provisional response
20									→	→		User B is informed of incoming file and accepts the transfer
21							←	←	←		200 OK	UE_B responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform A-side with specific data for a MSRP connection set up
22							→	→			200 OK	IMS_B forwards 200 OK response to AS/IM_B
23							←	←			200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
24						←	←				200 OK	IMS_B forwards 200 OK response to IBCF_B
25					←	←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
26				←	←						200 OK	IBCF_A forwards 200 OK response to IMS_A
27			←	←							200 OK	IMS_A forwards 200 OK response to AS/IM_A
28			→	→							200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
29		←	←								200 OK	IMS_A forwards 200 OK response to UE_A
30	←	←										User A is informed that file transfer has been accepted by user B
31		→	→								ACK	UE_A acknowledges the receipt of 200 OK for INVITE
32			←	←							ACK	IMS_A forwards ACK to AS/IM_A
33			→	→							ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
34				→	→						ACK	IMS_A forwards ACK to IBCF_A
35					→	→					ACK	IBCF_A forwards ACK to IBCF_B
36						→	→				ACK	IBCF_B forwards ACK to IMS_B
37							→	→			ACK	IMS_B forwards ACK to AS/IM_B
38							←	←			ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
39							→	→	→		ACK	IMS_B forwards ACK to UE_B
40	←									→		File transfer starts (see clause 5.3.3 Image data via MSRP and use 5.4.3 test description)
41												File transfer completed (size checked)

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
42											BYE	UE_A releases the file transfer session with BYE
43											BYE	IMS_A forwards BYE to AS/IM_A
44											BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
45											BYE	IMS_A forwards BYE to IBCF_A
46											BYE	IBCF_A forwards BYE to IBCF_B
47											BYE	IBCF_B forwards BYE to IMS_B
48											BYE	IMS_B forwards BYE to AS/IM_B
49											BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
50											BYE	IMS_B forwards BYE to UE_B
51												User B is informed that file transfer completed
52											200 OK	UE_B sends 200 OK for BYE
53											200 OK	IMS_B forwards 200 OK response to AS/IM_B
54											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
55											200 OK	IMS_B forwards 200 OK response to IBCF_B
56											200 OK	IBCF_B forwards 200 OK response to IBCF_A
57											200 OK	IBCF_A forwards 200 OK response to IMS_A
58											200 OK	IMS_A forwards 200 OK response to AS/IM_A
59											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
60											200 OK	IMS_A forwards 200 OK response to UE_A
61												User A is informed that file transfer completed

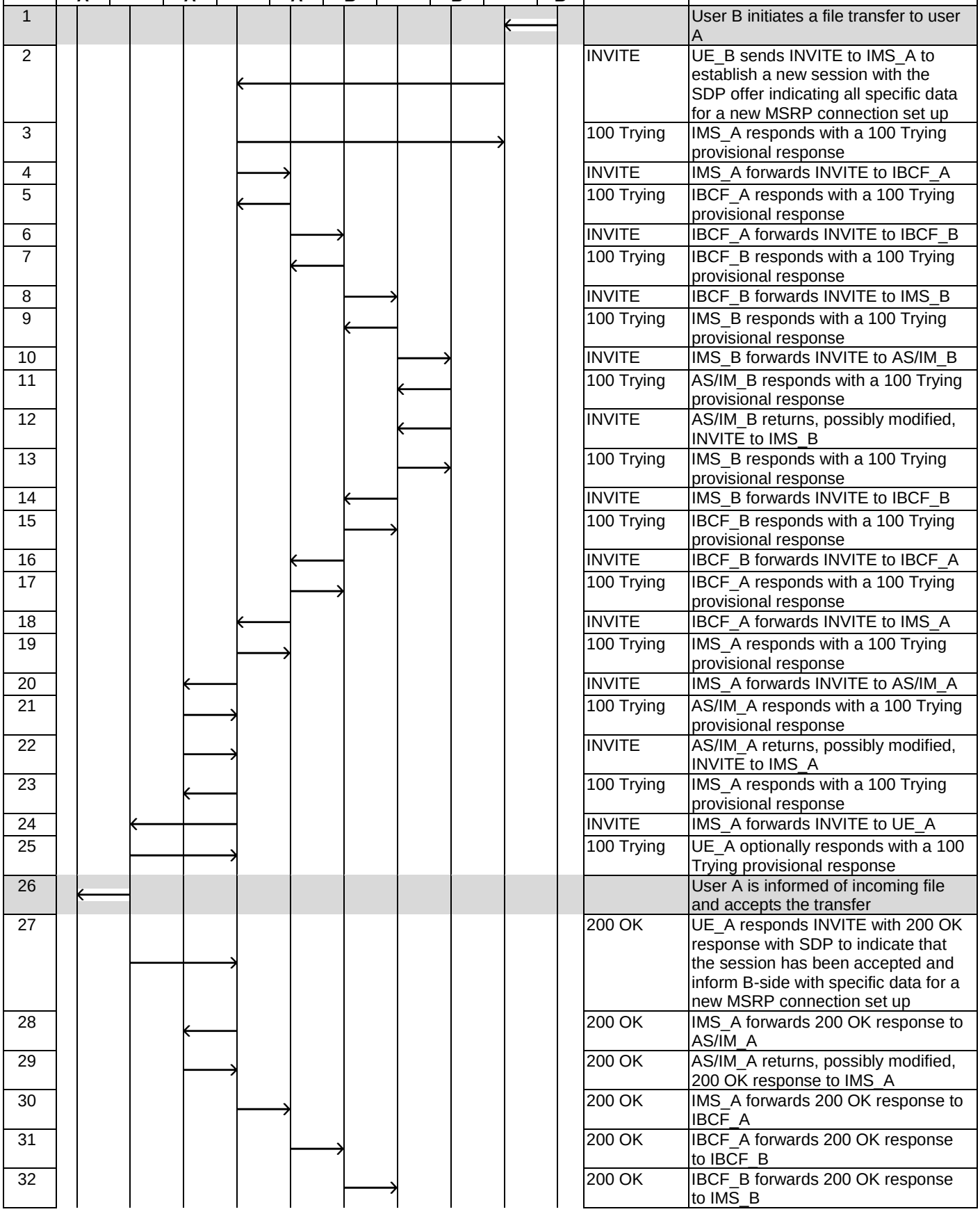
4.4.5.2 UC_RCS_9_R: SIP message flow for File transfer with CF_ROAM_AS (OPTIONAL)

The test sequence typically associated with this use case is as follows (CFW step numbers refer the call flow step numbering):

Step	Action	CF_ROAM_AS
1	User B initiates a file transfer to user A	Step 1
2	User A is informed of incoming file and accepts the transfer	Step 26
3	User B is informed that file transfer has been accepted by user A	Step 39
4	File transfer starts	Step 52
5	File transfer completed (size checked)	Step 53
6	User A is informed that file transfer completed	Step 66
7	User B is informed that file transfer completed	Step 79

The expected call flow sequence is:

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		



Step	Direction										Message	Comment
	User A	UE A	AS/IMA	IMS A	IBCF A	IBCF B	IMS B	AS/IMB	UE B	User B		
1									←			User B initiates a file transfer to user A
2				←					←		INVITE	UE_B sends INVITE to IMS_A to establish a new session with the SDP offer indicating all specific data for a new MSRP connection set up
3				→					→		100 Trying	IMS_A responds with a 100 Trying provisional response
4				→	→						INVITE	IMS_A forwards INVITE to IBCF_A
5				←	←						100 Trying	IBCF_A responds with a 100 Trying provisional response
6					→	→					INVITE	IBCF_A forwards INVITE to IBCF_B
7					←	←					100 Trying	IBCF_B responds with a 100 Trying provisional response
8						→	→				INVITE	IBCF_B forwards INVITE to IMS_B
9						←	←				100 Trying	IMS_B responds with a 100 Trying provisional response
10							→	→			INVITE	IMS_B forwards INVITE to AS/IM_B
11							←	←			100 Trying	AS/IM_B responds with a 100 Trying provisional response
12							←	←			INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
13							→	→			100 Trying	IMS_B responds with a 100 Trying provisional response
14						←	←				INVITE	IMS_B forwards INVITE to IBCF_B
15						→	→				100 Trying	IBCF_B responds with a 100 Trying provisional response
16					←	←					INVITE	IBCF_B forwards INVITE to IBCF_A
17					→	→					100 Trying	IBCF_A responds with a 100 Trying provisional response
18				←	←						INVITE	IBCF_A forwards INVITE to IMS_A
19				→	→						100 Trying	IMS_A responds with a 100 Trying provisional response
20			←	←							INVITE	IMS_A forwards INVITE to AS/IM_A
21			→	→							100 Trying	AS/IM_A responds with a 100 Trying provisional response
22			→	→							INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
23			←	←							100 Trying	IMS_A responds with a 100 Trying provisional response
24		←	←	←							INVITE	IMS_A forwards INVITE to UE_A
25		→	→	→							100 Trying	UE_A optionally responds with a 100 Trying provisional response
26	←	←										User A is informed of incoming file and accepts the transfer
27		→	→	→							200 OK	UE_A responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform B-side with specific data for a new MSRP connection set up
28			←	←							200 OK	IMS_A forwards 200 OK response to AS/IM_A
29			→	→							200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
30				→	→						200 OK	IMS_A forwards 200 OK response to IBCF_A
31					→	→					200 OK	IBCF_A forwards 200 OK response to IBCF_B
32						→	→				200 OK	IBCF_B forwards 200 OK response to IMS_B

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
33							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
34							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
35						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
36					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
37				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
38				→					→		200 OK	IMS_A forwards 200 OK response to UE_B
39									→			User B is informed that file transfer has been accepted by user B
40				←					←		ACK	UE_B acknowledges the receipt of 200 OK for INVITE
41				→							ACK	IMS_A forwards ACK to IBCF_A
42					→						ACK	IBCF_A forwards ACK to IBCF_B
43						→					ACK	IBCF_B forwards ACK to IMS_B
44							→				ACK	IMS_B forwards ACK to AS/IM_B
45							←				ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
46						←					ACK	IMS_B forwards ACK to IBCF_B
47					←						ACK	IBCF_B forwards ACK to IBCF_A
48				←							ACK	IBCF_A forwards ACK to IMS_A
49			←								ACK	IMS_A forwards ACK to AS/IM_A
50			→								ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
51		←									ACK	IMS_A forwards ACK to UE_A
52	←									→		File transfer starts (see clause 5.3.3 Image data via MSRP and use 5.4.3 test description)
53												File transfer completed (size checked)
54				←					←		BYE	UE_B releases the file transfer session with BYE
55				→							BYE	IMS_A forwards BYE to IBCF_A
56					→						BYE	IBCF_A forwards BYE to IBCF_B
57						→					BYE	IBCF_B forwards BYE to IMS_B
58							→				BYE	IMS_B forwards BYE to AS/IM_B
59							←				BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
60						←					BYE	IMS_B forwards BYE to IBCF_B
61					←						BYE	IBCF_B forwards BYE to IBCF_A
62				←							BYE	IBCF_A forwards BYE to IMS_A
63			←								BYE	IMS_A forwards BYE to AS/IM_A
64			→								BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
65		←									BYE	IMS_A forwards BYE to UE_A
66												User A is informed that file transfer completed
67		→									200 OK	UE_A sends 200 OK for BYE
68			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
69			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
70				→							200 OK	IMS_A forwards 200 OK response to IBCF_A

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
71					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
72						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
73							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
74							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
75						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
76					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
77				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
78				→	→	→	→	→			200 OK	IMS_A forwards 200 OK response to UE_B
79									→			User B is informed that file transfer completed

4.4.6 Geo-Location Services

Following there are the expected common call flow sequences for a standalone Geo-Location services.

According to RCS specification [12] there are two types of Geo-Location service:

- Geo-Location Push;
- Geo-Location Pull.

The Geo-Location Push service is based on the FT service (and thus the RCS user shall also have the FT service) - albeit with the Geo-Location Push service identified by a specific RCS tag.

The Geo-Location Pull service has two variants, each identified by specific RCS tags:

- Via FT. As for the push variant, the RCS user shall also have the FT service again with the Geo-Location Pull service identified by a specific RCS tag.
- Via Geo-Location API GW and LBS infrastructure. This is out of scope for the present document.

For all Use Cases it is assumed that UEs registered on the corresponding IMS networks and they have already performed capability discovery procedures. In particular, users subscribed to standalone File transfer service and the specific Geo-Location Push and Pull (via FT) services.

It should also be noted that Geo-Location information can be exchanged as part of the Social Presence service (see clause 4.4.2).

Finally, the mechanism by which the user obtains location information is out of scope for the present document.

4.4.6.1 UC_RCS_10_I: SIP message flow for Geo-Location Push with CF_INT_AS

The test sequence typically associated with this use case is as follows (CFW step numbers refer the call flow step numbering):

Step	Action	CF_INT_AS
1	User A initiates a geo-location push file transfer to user B	Step 1
2	User B is informed of incoming file and accepts the transfer.	Step 20
3	User A is informed that file transfer has been accepted by user B	Step 30
4	File transfer starts	Step 40
5	File transfer completed (size checked)	Step 41
6	User B is informed that file transfer completed	Step 51
7	User A is informed that file transfer completed	Step 61

The expected call flow sequence is:

Step	Direction										Message	Comment
	User A	UEA	AS/IMA	IMSA	IBCFA	IBCFB	IMSB	AS/IMB	UEB	User B		
1-61												As UC_RCS_9_I (1-61) with the following differences: User A initiates a geo-location push to user B. The Accept-Contact header in the SIP INVITE includes the tag for geo-location push. The file type to be transferred is specified as *application/rcspushlocation+xml*.

4.4.6.2 UC_RCS_10_I: SIP message flow for Geo-Location Pull via File transfer with CF_INT_AS

The test sequence typically associated with this use case is as follows (CFW step numbers refer the call flow step numbering):

Step	Action	CF_INT_AS
1	User A initiates a geo-location pull via file transfer to user B	Step 1
2	User B is informed of incoming file and agrees to share geo-location information.	Step 20
3	User A is informed that file transfer request has been accepted by user B	Step 30
4	File transfer starts (B to A)	Step 40
5	File transfer completed (size checked)	Step 41
6	User B is informed that file transfer completed	Step 51
7	User A is informed that file transfer completed	Step 61

The expected call flow sequence is:

Step	Direction										Message	Comment
	User A	UEA	AS/IMA	IMSA	IBCFA	IBCFB	IMSB	AS/IMB	UEB	User B		

Step	Direction										Message	Comment
	User A	UEA	AS/IMA	IMSA	IBCFA	IBCFB	IMSB	AS/IMB	UEB	User B		
1-19												As UC_RCS_9_I (1-19) with the following differences: User A initiates a geo-location pull to user B. The Accept-Contact header in the SIP INVITE includes the tag for geo-location pull (via FT). The SDP media attribute is set to recvonly. The file type to be transferred is specified as *application/rcspushlocation+xml*.
20												User B is informed of incoming request and agrees to share geo-location information.
21-61												As UC_RCS_9_I (21-61) with the following differences: FT occurs from B to A.

4.4.6.3 UC_RCS_10_R: SIP message flow for Geo-Location Push with CF_ROAM_AS

The test sequence typically associated with this use case is as follows (CFW step numbers refer the call flow step numbering):

Step	Action	CF_ROAM_AS
1	User B initiates a file transfer to user A	Step 1
2	User A is informed of incoming file and accepts the transfer	Step 26
3	User B is informed that file transfer has been accepted by user A	Step 39
4	File transfer starts	Step 52
5	File transfer completed (size checked)	Step 53
6	User A is informed that file transfer completed	Step 66
7	User B is informed that file transfer completed	Step 79

The expected call flow sequence is:

Step	Direction										Message	Comment
	User A	UEA	AS/IMA	IMSA	IBCFA	IBCFB	IMSB	AS/IMB	UEB	User B		
1-79												As UC_RCS_9_R (1-79) with the following differences: User B initiates a geo-location push to user A. The Accept-Contact header in the SIP INVITE includes the tag for geo-location push. The file type to be transferred is specified as *application/rcspushlocation+xml*.

4.4.6.4 UC_RCS_10_R: SIP message flow for Geo-Location Pull via File Transfer with CF_ROAM_AS

The test sequence typically associated with this use case is as follows (CFW step numbers refer the call flow step numbering):

Step	Action	CF_ROAM_AS
1	User B initiates a file transfer to user A	Step 1
2	User A is informed of incoming file and agrees to share geo-location information.	Step 26
3	User B is informed that file transfer request has been accepted by user A	Step 39
4	File transfer starts	Step 52
5	File transfer completed (size checked)	Step 53
6	User A is informed that file transfer completed	Step 66
7	User B is informed that file transfer completed	Step 79

The expected call flow sequence is:

Step	Direction											Message	Comment
	User A	UEA	AS/IMA	IMSA	IBCFA	IBCFB	IMSB	AS/IMB	UEB	User B			
1-25													As UC_RCS_9_R (1-25) with the following differences: User A initiates a geo-location pull to user B. The Accept-Contact header in the SIP INVITE includes the tag for geo-location pull (via FT). The SDP media attribute is set to recvonly. The file type to be transferred is specified as *application/rcspushlocation+xml*.
26													User A is informed of incoming file transfer request and agrees to share geo-location information.
27-79													As UC_RCS_9_R (27-79) with the following differences: FT occurs from A to B.

4.4.7 Standalone Messaging

CPM permits messages under 1 300 bytes to be conveyed via a the Standalone Messaging service via a single SIP transaction. This is the so-called pager-mode. Larger messages shall be conveyed via a MSRP session as described in clause 4.4.

There is a discrete RCS tag defined for the Standalone Message Service.

For all Use Cases it is assumed that UEs registered on the corresponding IMS networks and they have already performed capability discovery procedures. In particular, users subscribed to the Standalone Message service and the size of the message to be conveyed is under the pager-mode threshold.

4.4.7.1 UC_RCS_11_I: SIP message flow for Standalone Messaging procedure with CF_INT_AS

The test sequence typically associated with this use case is as follows (CFW step numbers refer the call flow step numbering):

Step	Action	CF_INT_AS
1	User A selects User B in the phone address book and sends him an initial message	Step 1
2	User B is informed of incoming message	Step 11
3	User A is informed that initial message was delivered to user B	Step 29
4	User B reads the initial message from user A .	Step 40

The expected call flow sequence is:

Step	Direction	Message	Comment
	User A / UE A / AS/IM A / IMS A / IBCF A / IBCF B / IMS B / AS/IM B / UE B / User B		
1	User A → UE A		User A selects User B in the phone address book and sends him the standalone message
2	UE A → IMS A	MESSAGE	UE_A sends MESSAGE to IMS_A with a MIME body of type *message/cpim* containing the message to be conveyed.
3	IMS A → AS/IM A	IMESSAGE	IMS_A forwards MESSAGE to AS/IM_A
4	AS/IM A → IMS A	MESSAGE	AS/IM_A returns, possibly modified, MESSAGE to IMS_A
5	IMS A → IBCF A	MESSAGE	IMS_A forwards MESSAGE to IBCF_A
6	IBCF A → IBCF B	MESSAGE	IBCF_A forwards MESSAGE to IBCF_B
7	IBCF B → IMS B	MESSAGE	IBCF_B forwards MESSAGE to IMS_B
8	IMS B → AS/IM B	MESSAGE	IMS_B forwards MESSAGE to AS/IM_B
9	AS/IM B → IMS B	MESSAGE	AS/IM_B returns, possibly modified, MESSAGE to IMS_B
10	IMS B → UE B	MESSAGE	IMS_B forwards MESSAGE to UE_B
11	UE B → User B		User B is informed of incoming message
12	UE B → IMS B	200 OK	UE_B sends 200 OK (MESSAGE)
13	IMS B → AS/IM B	200 OK	IMS_B forwards 200 OK to AS/IM_B
14	AS/IM B → IMS B	200 OK	AS/IM_B returns, possibly modified, 200 OK to IMS_B
15	IMS B → IBCF B	200 OK	IMS_B forwards 200 OK to IBCF_B
16	IBCF B → IBCF A	200 OK	IBCF_B forwards 200 OK to IBCF_A
17	IBCF A → IMS A	200 OK	IBCF_A forwards 200 OK to IMS_A
18	IMS A → AS/IM A	200 OK	IMS_A forwards 200 OK to AS/IM_A
19	AS/IM A → IMS A	200 OK	AS/IM_A returns, possibly modified, 200 OK to IMS_A
20	IMS A → UE A	200 OK	IMS_A forwards 200 OK to UE_A
21	UE B → IMS B	MESSAGE	If requested in CPIM, UE_B sends MESSAGE to IMS_B with delivery notification of the message from user A
22	IMS B → AS/IM B	MESSAGE	IMS_B forwards MESSAGE to AS/IM_B

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
23							←				MESSAGE	AS/IM_B returns, possibly modified, MESSAGE to IMS_B
24						←					MESSAGE	IMS_B forwards MESSAGE to IBCF_B
25					←						MESSAGE	IBCF_B forwards MESSAGE to IBCF_A
26				←							MESSAGE	IBCF_A forwards MESSAGE to IMS_A
27			←								MESSAGE	IMS_A forwards MESSAGE to AS/IM_A
28			→								MESSAGE	AS/IM_A returns, possibly modified, MESSAGE to IMS_A
29		←									MESSAGE	IMS_A forwards MESSAGE to UE_A
30	←											User A is informed that initial message was delivered to user B
31		→									200 OK	UE_A responds to the MESSAGE with 200 OK response
32			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
33			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
34				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
35					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
36						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
37							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
38							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
39							→				200 OK	IMS_B forwards 200 OK response to UE_B
40												User B reads the initial message from user A. If a read receipt was also requested via CPIM, then there is a further MESSAGE/200 OK exchange as shown in steps 30-48.

4.4.7.2 UC_RCS_11_R: SIP message flow for Standalone Messaging procedure with CF_ROAM_AS

The test sequence typically associated with this use case is as follows (CFW step numbers refer the call flow step numbering):

Step	Action	CF_ROAM_AS
1	User B selects User A in the phone address book and sends him an initial message	Step 1
2	User A is informed of incoming message	Step 14
3	User B is informed that the message was delivered to user A	Step 39
4	User A reads the message from user B.	Step 52

The expected call flow sequence is:

Step	Direction										Message	Comment
	User A	UEA	AS/IMA	IMSA	IBCFA	IBCFB	IMSB	AS/IMB	UEB	User B		
1									←			User B selects User A in the phone address book and sends him a standalone message
2				←							MESSAGE	UE_B sends MESSAGE to IMS_A with a MIME body of type *message/cpim* containing the message to be conveyed.
3				→							MESSAGE	IMS_A forwards MESSAGE to IBCF_A
4					→						MESSAGE	IBCF_A forwards MESSAGE to IBCF_B
5						→					MESSAGE	IBCF_B forwards MESSAGE to IMS_B
6							→				MESSAGE	IMS_B forwards MESSAGE to AS/IM_B
7							←				MESSAGE	AS/IM_B returns, possibly modified, MESSAGE to IMS_B
8						←					MESSAGE	IMS_B forwards MESSAGE to IBCF_B
9					←						MESSAGE	IBCF_B forwards MESSAGE to IBCF_A
10				←							MESSAGE	IBCF_A forwards MESSAGE to IMS_A
11			←								MESSAGE	IMS_A forwards MESSAGE to AS/IM_A
12			→								MESSAGE	AS/IM_A returns, possibly modified, MESSAGE to IMS_A
13		←									MESSAGE	IMS_A forwards MESSAGE to UE_A
14	←											User A is informed of incoming message
15		→									200 OK	UE_A sends 200 OK to IMS_A in response to receipt of MESSAE from UE B.
16			←								200 OK	IMS_A forwards 200 OK to AS/IM_A
17			→								200 OK	AS/IM_A returns, possibly modified, 200 OK to IMS_A
18				→							200 OK	IMS_A forwards 200 OK to IBCF_A
19					→						200 OK	IBCF_A forwards 200 OK to IBCF_B
20						→					200 OK	IBCF_B forwards 200 OK to IMS_B
21							→				200 OK	IMS_B forwards 200 OK to AS/IM_B
22							←				200 OK	AS/IM_B returns, possibly modified, 200 OK to IMS_B
23						←					200 OK	IMS_B forwards 200 OK to IBCF_B
24					←						200 OK	IBCF_B forwards 200 OK to IBCF_A
25				←							200 OK	IBCF_A forwards 200 OK to IMS_A
26				→					→		200 OK	IMS_A forwards 200 OK to UE_B
27		→									MESSAGE	If requested in the CPIM , UE_A sends MESSAGE to IMS_A with delivery notification of initial message from user B
28			←								MESSAGE	IMS_A forwards MESSAGE to AS/IM_A
29			→								MESSAGE	AS/IM_A returns, possibly modified, MESSAGE to IMS_A
30				→							MESSAGE	IMS_A forwards MESSAGE to IBCF_A
31					→						MESSAGE	IBCF_A forwards MESSAGE to IBCF_B

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
32						→					MESSAGE	IBCF_B forwards MESSAGE to IMS_B
33							→				MESSAGE	IMS_B forwards MESSAGE to AS/IM_B
34							←				MESSAGE	AS/IM_B returns, possibly modified, MESSAGE to IMS_B
35						←					MESSAGE	IMS_B forwards MESSAGE to IBCF_B
36					←						MESSAGE	IBCF_B forwards MESSAGE to IBCF_A
37				←							MESSAGE	IBCF_A forwards MESSAGE to IMS_A
38				→	→	→	→	→	→		MESSAGE	IMS_A forwards MESSAGE to UE_B
39									→	→		User B is informed that initial message was delivered to user A
40				←	←	←	←	←	←		200 OK	UE_B responds MESSAGE with 200 OK response
41				→	→						200 OK	IMS_A forwards 200 OK response to IBCF_A
42					→	→					200 OK	IBCF_A forwards 200 OK response to IBCF_B
43						→	→				200 OK	IBCF_B forwards 200 OK response to IMS_B
44							→	→			200 OK	IMS_B forwards 200 OK response to AS/IM_B
45							←	←			200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
46						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
47					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
48				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
49			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
50			→								200 OK	AS/IM_A returns, possibly modified, ACK to IMS_A
51		←									200 OK	IMS_A forwards 200 OK to UE_A
52	→											User A reads the initial message from user A .If a read receipt was also requested via CPIM, then there is a further MESSAGE/200 OK exchange as shown in steps 27-51.

4.4.8 Multi-Tasking

Multi tasking is where an RCS service occurs in parallel to a voice session involving a separate user (e.g. A-B in speech and then an additional RCS session involving A or B with a separate user C. Flows can be derived for multi-tasking scenarios with reference to previous clauses 4.4.1 through 4.4.7 in conjunction with flows documented in TS 186 011-2 [7] and RFC 4976 [9].

4.5 Test Descriptions

This clause introduces interoperability test descriptions (TDs) which realize one or more IMS NNI test purposes of TS 186 011-1 [2].

Each TD is defined on the basis of one of the generic use cases forms presented in the previous clause and in TS 186 011-2 [7], clause 4.4. Each test sequence step in a TD includes also a reference to a specific call flow step of the generic use case. Call flow steps which are associated with the test body are repeated after each TD and include any modifications necessary to adapt the generic use case. In the adapted call flow steps that are associated with user interactions are shown shaded and steps which have pass criteria are shown in bold.

Note that the expected test sequence may only show the Call Flow that affects the test.

In the tabulations which follow, all references are to TS 124 229 [1] or GSMA™ RCS V5.1 [12].

4.5.1 Capability discovery

4.5.1.1 Capability discover through OPTIONS - User B is Registered - interworking

Interoperability Test Description		
Identifier:	TD_IMS_CAP_0001	
Summary:	IMS network supports capability discovery and OPTIONS messages exchange between two users in their home network can be performed. User B is registered.	
Configuration:	CF_INT_CALL	
SUT	IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5097_15	TS 124 229 [1], clause 5.4.3.2 ¶11 (1st numbered list)
	TP_IMS_5117_02	TS 124 229 [1], clause 5.4.3.3 ¶100 (item 2 in 5th numbered list)
	TP_IMS_5118_01	TS 124 229 [1], clause 5.4.3.3 ¶105 (item 2 in 6th numbered list)
Use Case ref.:	UC_RCS_1_I	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User A selects a contact of user B in the phone address book
	2	User B is informed about user A capabilities
	3	User A is informed about user B capabilities
Conformance Criteria:	**Check**	
	1	TP_IMS_5097_15 in CFW step 4 (OPTIONS): *ensure that {* *when { UE_A sends an OPTIONS to UE_B }* *then { IMS_B receives the OPTIONS* *not containing a Route_header* *indicating the S-CSCF_SIP_URI of IMS_A* *containing a P-Charging-Vector_header* *(containing an icid-value_parameter and* *containing a orig-ioi_parameter indicating IMS_A and* *not containing an access-network-charging-info_parameter and* *not containing a term-ioi_parameter) and* *containing a Record-Route_header* *indicating the originating S-CSCF_SIP_URI and* *not containing a P- access-network-info header}*

Interoperability Test Description		
		}
	2	TP_IMS_5117_02 in CFW step 10 (200 OK) *ensure that {* *when { UE_B sends a 2xx_response to UE_A }* *then { IMS_A receives the 2xx_response* *containing a P-Charging-Vector_header* *not containing an access-network-charging-info_parameter }* *}*
	3	TP_IMS_5118_01 in CFW step 10 (200 OK) *ensure that {* *when { UE_B sends 200_response to UE_A }* *then { IMS_A receives the 200_response* *containing a P-Charging-Vector_header* *containing a orig-ioi_parameter* *indicating operator_identifier of IMS_A and* *containing a term-ioi_parameter* *indicating operator_identifier of IMS_B }* *}*

Step	Direction								Message	Comment
	User A	UE A	IMS A	IBCF A	IBCF B	IMS B	UE B	User B		
1										User A selects a contact of user B in the phone address book
2			→						OPTIONS	UE_A sends OPTIONS to IMS_A with Accept-contact header containing user A capabilities (RCS services Tags(RCS services Tags)
3				→					OPTIONS	IMS_A forwards OPTIONS to IBCF_A
4					→				OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
5						→			OPTIONS	IBCF_B forwards OPTIONS to IMS_B
6							→		OPTIONS	IMS_B forwards OPTIONS to UE_B
7										User B is informed about user A capabilities
8						←			200 OK	UE_B responds with 200 OK to IMS_B with Contact header containing user B capabilities (RCS services Tags(RCS services Tags)
9					←				200 OK	IMS_B forwards 200 OK to IBCF_B
10				←					200 OK	IBCF_B forwards 200 OK to IBCF_A
11			←						200 OK	IBCF_A forwards 200 OK to IMS_A
12		←							200 OK	IMS_A forwards 200 OK to UE_A
13										User A is informed about user B capabilities

4.5.1.2 Capability discover through OPTIONS - User B is Registered - roaming

Interoperability Test Description		
Identifier:	TD_IMS_CAP_0002	
Summary:	IMS network supports capability discovery and OPTIONS messages exchange between one user in its home network and another in visited network can be performed. User B is registered.	
Configuration:	CF_ROAM_CALL (OPTIONAL)	
SUT	IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5108_01	TS 124 229 [1], clause 5.4.3.3 ¶5 (1st numbered list)
	TP_IMS_5117_02	TS 124 229 [1], clause 5.4.3.3 ¶100 (item 2 in 5th numbered list)
	TP_IMS_5118_01	TS 124 229 [1], clause 5.4.3.3 ¶105 (item 2 in 6th numbered list)
Use Case ref.:	UC_RCS_1_R	

Interoperability Test Description		
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B via IMS A optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User A selects a contact of user B in the phone address book
	2	User B is informed about user A capabilities
	3	User A is informed about user B capabilities
Conformance Criteria:	**Check**	
	1	TP_IMS_5108_01 in CFW step 7 (OPTIONS): *ensure that {* *when { UE_B sends an OPTIONS to UE_A* *IMS_A sends the OPTIONS to IMS_B* *containing a P-Charging-Vector_header* *containing an icid-value_parameter }* *then { IMS_B sends the OPTIONS to IMS_A* *containing no Route_header* *indicating the S-CSCF_SIP_URI of IMS_B and* *containing a P-Charging-Vector_header* *containing the same icid-value_parameter and* *not containing ioi_parameters* *containing a Record-Route_header* *containing the S-CSCF_SIP_URI of IMS_B }* *}*
	2	TP_IMS_5117_02 in CFW step 16 (200 OK) *ensure that {* *when { UE_B sends a 2xx_response to UE_A }* *then { IMS_A receives the 2xx_response* *containing a P-Charging-Vector_header* *not containing an access-network-charging-info_parameter }* *}*
	3	TP_IMS_5118_01 in CFW step 16 (200 OK) *ensure that {* *when { UE_B sends 200_response to UE_A }* *then { IMS_A receives the 200_response* *containing a P-Charging-Vector_header* *containing a orig-ioi_parameter* *indicating operator_identifier of IMS_A and* *containing a term-ioi_parameter* *indicating operator_identifier of IMS_B }* *}*

Step	Direction								Message	Comment
	User A	UEA	IMSA	IBCFA	IBCFB	IMSB	UEB	User B		
1										User A selects a contact of user B in the phone address book
2			→						OPTIONS	UE_A sends OPTIONS to IMS_A with Accept-contact header containing user A capabilities (RCS services Tags(RCS services Tags)
3			→	→					OPTIONS	IMS_A forwards OPTIONS to IBCF_A
4				→	→				OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
5					→	→			OPTIONS	IBCF_B forwards OPTIONS to IMS_B
6					←	→			OPTIONS	IMS_B forwards OPTIONS to IBCF_B
7				←					OPTIONS	IBCF_B forwards OPTIONS to IBCF_A
8			←	←					OPTIONS	IBCF_A forwards OPTIONS to IMS_A
9			→	→	→	→	→		OPTIONS	IMS_A forwards OPTIONS to UE_B
10										User B is informed about user A capabilities
11			←	←					200 OK	UE_B responds with 200 OK to IMS_A with Contact header containing user B capabilities (RCS services Tags(RCS services Tags)
12			→						200 OK	IMS_A forwards 200 OK to IBCF_A
13				→					200 OK	IBCF_A forwards 200 OK to IBCF_B
14					→				200 OK	IBCF_B forwards 200 OK to IMS_B
15					←				200 OK	IMS_B forwards 200 OK to IBCF_B
16				←					200 OK	IBCF_B forwards 200 OK to IBCF_A
17			←						200 OK	IBCF_A forwards 200 OK to IMS_A
18		←							200 OK	IMS_A forwards 200 OK to UE_A
19	←									User A is informed about user B capabilities

4.5.1.3 Capability discover through OPTIONS- User B is not Registered - interworking

Interoperability Test Description		
Identifier:	TD_IMS_CAP_0003	
Summary:	IMS network supports capability discovery and OPTIONS messages exchange between two users in their home network can be performed. User B is not registered.	
Configuration:	CF_INT_CALL	
SUT	IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5097_15	TS 124 229 [1], clause 5.4.3.2 ¶11 (1st numbered list)
	TP_IMS_5114_03	TS 124 229 [1], clause 5.4.3.3 ¶85 (item 3 in 3rd numbered list) and GSMA™ RCS V5.1 [12], clause 2.3.1
Use Case ref.:	UC_RCS_1_I	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is not registered in IMS_B • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • IMS_A not configured for topology hiding	

Interoperability Test Description		
Test Sequence:	**Step**	
	1	User A selects a contact of user B in the phone address book
	2	User A is informed that user B is offline (not registered)
Conformance Criteria:	**Check**	
	1	TP_IMS_5097_15 in CFW step 4 (OPTIONS): *ensure that {* *when { UE_A sends an OPTIONS to UE_B }* *then { IMS_B receives the OPTIONS* *not containing a Route_header* *indicating the S-CSCF_SIP_URI of IMS_A* *containing a P-Charging-Vector_header* *(containing an icid-value_parameter and* *containing a orig-ioi_parameter indicating IMS_A and* *not containing an access-network-charging-info_parameter and* *not containing a term-ioi_parameter) and* *containing a Record-Route_header* *indicating the originating S-CSCF_SIP_URI and* *not containing a P- access-network-info header}* *}*
	2	TP_IMS_5114_03 in CFW step 7 (480 or 408 Response) *ensure that {* *when { UE_A sends a OPTIONS to UE_B and* *IMS_A sends the OPTIONS to IMS_B }* *then { IMS_B sends a 480 or 408_response to IMS_A* *}* *}*

Step	Direction								Message	Comment
	User A	UEA	IMSA	IBCFA	IBCFB	IMSB	UEB	User B		
1										User A selects a contact of user B in the phone address book
2			→						OPTIONS	UE_A sends OPTIONS to IMS_A with Accept-contact header containing user A capabilities (RCS services Tags(RCS services Tags)
3				→					OPTIONS	IMS_A forwards OPTIONS to IBCF_A
4					→				OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
5						→			OPTIONS	IBCF_B forwards OPTIONS to IMS_B
6						←			480 Not Registered/ 408 Request Timeout	IMS_B responds OPTIONS with 480 Not Registered/408 Request Timeout to IBCF_B
7					←				480 Not Registered/ 408 Request Timeout	IBCF_B forwards 480 Not Registered/408 Request Timeout response to IBCF_A
8				←					480 Not Registered/ 408 Request Timeout	IBCF_A forwards 480 Not Registered/408 Request Timeout response to IMS_A
9			←						480 Not Registered/ 408 Request Timeout	IMS_A forwards 480 Not Registered/408 Request Timeout response to UE_A
10										User A is informed that user B is offline (not registered)

4.5.1.4 Capability discover through OPTIONS - User B is not provisioned for RCS - interworking

Interoperability Test Description		
Identifier:	TD_IMS_CAP_0004	
Summary:	IMS network supports capability discovery and OPTIONS messages exchange between two users in their home network can be performed. User B is not provisioned for RCS services.	
Configuration:	CF_INT_CALL	
SUT	IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5097_15	TS 124 229 [1], clause 5.4.3.2 ¶11 (1st numbered list)
	TP_IMS_5132_02	GSMA™ RCS V5.1 [12], clause 2.3.1
Use Case ref.:	UC_RCS_1_I	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B without RCS capabilities • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User A selects a contact of user B in the phone address book
	2	User A is informed that user B is not provisioned for RCS
Conformance Criteria:	**Check**	
	1	TP_IMS_5097_15 in CFW step 4 (OPTIONS): *ensure that {* *when { UE_A sends an OPTIONS to UE_B }* *then { IMS_B receives the OPTIONS* *not containing a Route_header* *indicating the S-CSCF_SIP_URI of IMS_A* *containing a P-Charging-Vector_header* *(containing an icid-value_parameter and* *containing a orig-ioi_parameter indicating IMS_A and* *not containing an access-network-charging-info_parameter and* *not containing a term-ioi_parameter) and* *containing a Record-Route_header* *indicating the originating S-CSCF_SIP_URI and* *not containing a P- access-network-info header}* *}*
	2	TP_IMS_5132_02 in CFW step 7 (404 Not Found): *ensure that {* *when { UE_A sends an OPTIONS* *containing a Request_URI* *indicating a non- RCS user in IMS_B and* *IMS_A sends the OPTIONS to IMS_B }* *then { IMS_B sends an appropriate 404 response to IMS_A }* *}*

Step	Direction								Message	Comment
	User A	UEA	IMSA	IBCFA	IBCFB	IMSB	UEB	User B		
1										User A selects a contact of user B in the phone address book
2			→						OPTIONS	UE_A sends OPTIONS to IMS_A with Accept-contact header containing user A capabilities (RCS services Tags(RCS services Tags)
3				→					OPTIONS	IMS_A forwards OPTIONS to IBCF_A
4					→				OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
5						→			OPTIONS	IBCF_B forwards OPTIONS to IMS_B
6						←			404 Not Found	IMS_B responds OPTIONS with 404 Not Found to IBCF_B
7					←				404 Not Found	IBCF_B forwards 404 Not Found response to IBCF_A
8				←					404 Not Found	IBCF_A forwards 404 Not Found response to IMS_A
9			←						404 Not Found	IMS_A forwards 404 Not Found response to UE_A
10										User A is informed that user B is not provisioned for RCS

4.5.2 Social Presence

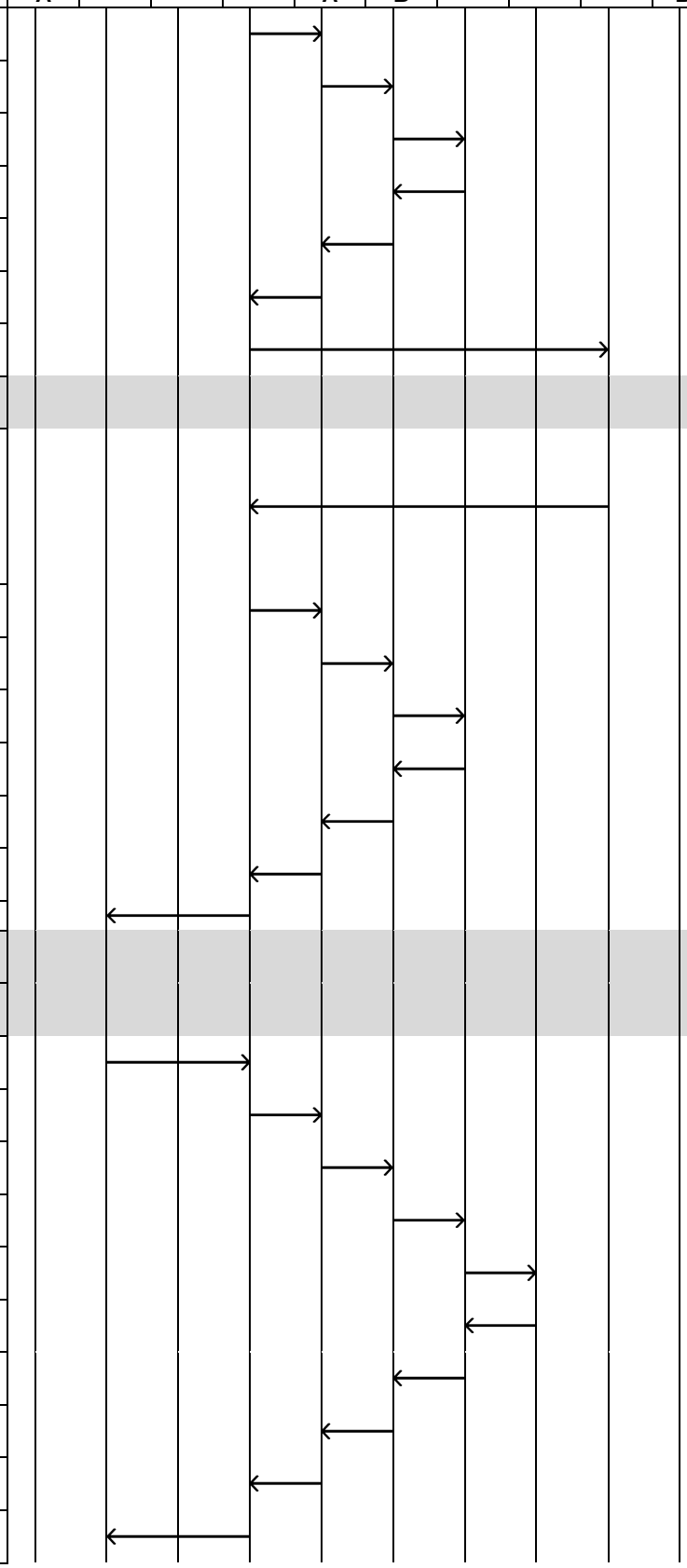
4.5.2.1 Watcher subscription for presence event notification in visited network

Interoperability Test Description		
Identifier:	TD_IMS_PRES_0001	
Summary:	IMS network supports properly presence service when a watcher subscribes to presence information for a presentity that it's located in a different network.	
Configuration:	CF_ROAM_AS (OPTIONAL)	
SUT	IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5097_13	TS 124 229 [1], clause 5.4.3.2 ¶1
	TP_IMS_5108_07	TS 124 229 [1], clause 5.4.3.3 ¶1
	TP_IMS_5115_08	TS 124 229 [1], clause 5.4.3.3 ¶65
Use Case ref.:	UC_RCS_2_R	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B via IMS_A optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User B publishes presence and capability information
	2	User B is informed of its presence status update
	3	User A selects a contact of user B in the phone address book
	4	User B is informed about user A capabilities
	5	User A is informed about user B capabilities
	6	User A subscribes to presence and capability information from User B
	7	SUBSCRIPTION triggers the AS to send a NOTIFY to UE_B indicating the change to the watcher information subscriber
	8	User B receives an authorization request from User A to see its own presence and capability information

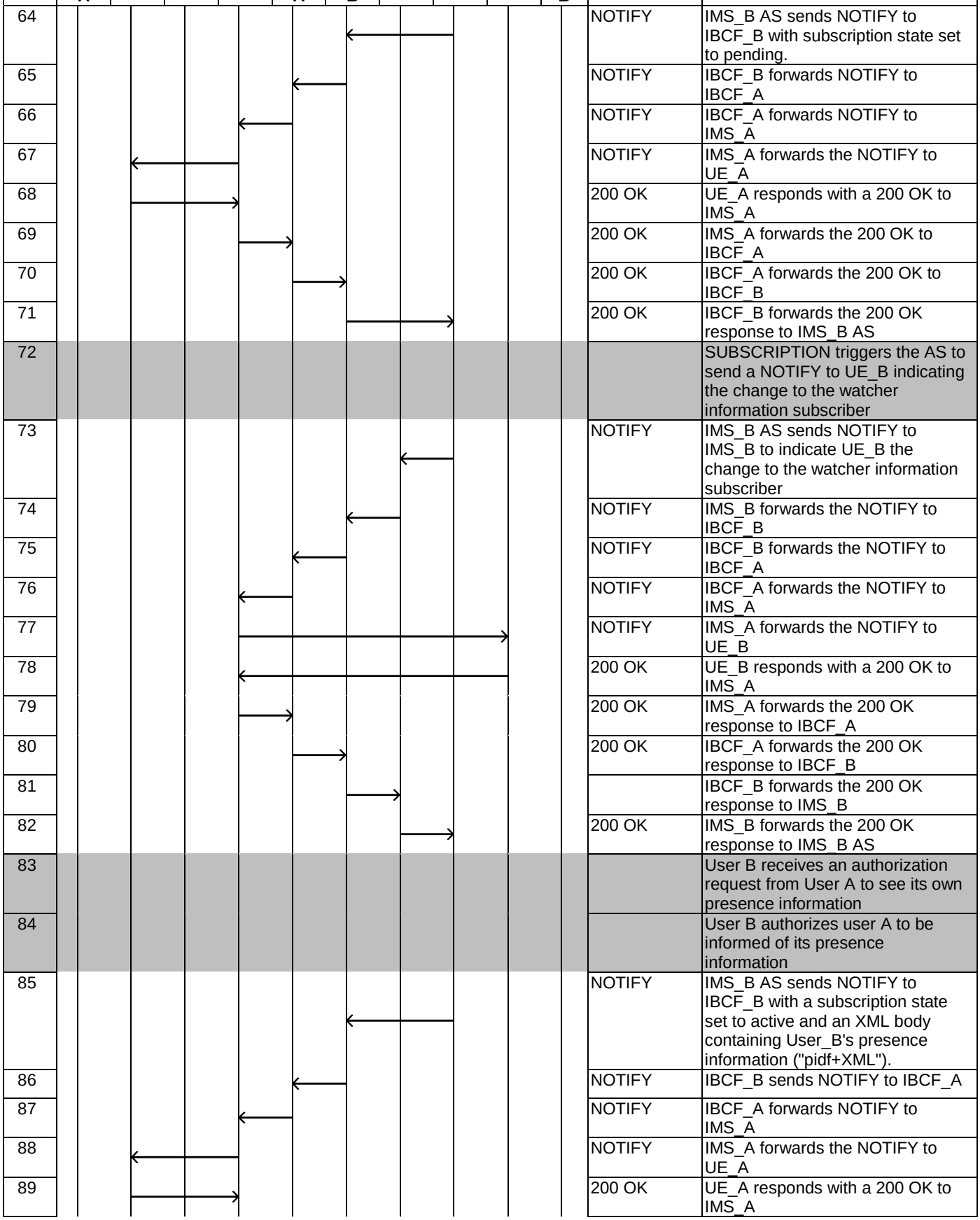
Interoperability Test Description		
	9	User B authorizes user A to be informed of its own presence and capability information
	10	User A is informed of user B presence and capability information
	11	User A sees user B presence and capability information
Conformance Criteria:	**Check**	
	1	TP_IMS_5097_13 in CFW step 6 (PUBLISH): *ensure that {* *when { IUT receives a PUBLISH from IMS_A from UE_B }* *then {IUT sends the PUBLISH to AS_B* *containing a Route_header* *indicating the SIP_URI of AS_B and* *containing a P-Charging-Function-Addresses_header and* *containing a P-Charging-Vector_header* *(containing an orig-ioi_parameter* *indicating IMS_A and* *not containing a term-ioi_parameter and* *containing an access-network-charging-info_parameter) }* *}*
	2	TP_IMS_5108_07 in CFW step 58 (SUBSCRIBE): *ensure that {* *when { IUT receives a SUBSCRIBE from IMS_A addressed_to UE_B}* *then { IUT sends the SUBSCRIBE to AS_B* *containing a topmost Route_header* *indicating the SIP_URI of AS_B and* *containing a Route_header* *indicating the S-CSCF_SIP_URI of IUT_* *containing a P-Charging-Vector_header* *(containing an orig-ioi_parameter* *indicating IMS_A and* *not containing a term-ioi_parameter) }* *}*
	3	TP_IMS_5115_08 in CFW step 59 (200 OK): *ensure that {* *when { AS_B sends a 200 response to UE_A }* *then { IMS_B receives the 200 response* *containing a P-Charging-Vector_header* *containing a orig-ioi_parameter indicating IMS_A and* *containing a term-ioi_parameter indicating IMS_B }* *}*

Step	Direction										Message	Comment
	User A	UEA	ASA	IMSA	IBCFA	IBCFB	IMSB	ASB	UEB	User B		
1												User B publishes presence and capability information
2				←					←		PUBLISH	UE_B sends PUBLISH with information for all commonly supported presence elements
3				→							PUBLISH	IMS_A forwards the PUBLISH to IBCF_A
4					→						PUBLISH	IBCF_A forwards the PUBLISH to IBCF_B
5						→					PUBLISH	IBCF_B forwards the PUBLISH to IMS_B
6							→				PUBLISH	IMS_B forwards the PUBLISH to IMS_B AS (PS)
7							←				200 OK	IMS_B AS responds with a 200 OK to IMS_B
8						←					200 OK	IMS_B forwards the 200 OK response to IBCF_B

Step	Direction										Message	Comment
	User A	UE A	ASA	IMS A	IBCF A	IBCF B	IMS B	AS B	UE B	User B		
9					←						200 OK	IBCF_B forwards the 200 OK response to IBCF_A
10				←							200 OK	IBCF_A forwards the 200 OK response to IMS_A
11				→					→		200 OK	IMS_A forwards the 200 OK response to UE_B
12												User B is informed of its presence status update
13												User B subscribes to be informed of watcher information
14				←					←		SUBSCRIBE	UE_B sends a SUBSCRIBE to be informed of event watcher information (Event: presence.winfo)
15				→	→						SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IBCF_A
16					→	→					SUBSCRIBE	IBCF_A forwards the SUBSCRIBE to IBCF_B
17						→	→				SUBSCRIBE	IBCF_B forwards the SUBSCRIBE to IMS_B
18							→	→			SUBSCRIBE	IMS_B forwards the SUBSCRIBE to IMS_B AS (PS)
19							←	←			200 OK	IMS_B AS responds with a 200 OK to IMS_B
20						←	←				200 OK	IMS_B forwards the 200 OK response to IBCF_B
21					←	←					200 OK	IBCF_B forwards the 200 OK response to IBCF_A
22				←	←						200 OK	IBCF_A forwards the 200 OK response to IMS_A
23				→					→		200 OK	IMS_A forwards the 200 OK response to UE_B
24							←	←			NOTIFY	IMS_B AS send a NOTIFY to IMS_B containing watcher info (XML body of "watcherinfo+XML").
25						←	←				NOTIFY	IMS_B forwards the NOTIFY response to IBCF_B
26					←	←					NOTIFY	IBCF_B forwards the NOTIFY response to IBCF_A
27				←	←						NOTIFY	IBCF_A forwards the NOTIFY response to IMS_A
28				→					→		NOTIFY	IMS_A forwards the NOTIFY response to UE_B
29				←					←		200 OK	UE_B sends a 200 OK to the NOTIFY
30				→	→						200 OK	IMS_A forwards the 200 OK to IBCF_A
31					→	→					200 OK	IBCF_A forwards the 200 OK to IBCF_B
32						→	→				200 OK	IBCF_B forwards the 200 OK to IMS_B
33							→	→			200 OK	IMS_B forwards the 200 OK to IMS_B AS (PS)
34												User A selects a contact of user B in the phone address book
35		→	→								OPTIONS	UE_A sends OPTIONS to IMS_A with Accept-contact header containing user A capabilities (RCS services Tags and the Tag indicating support of social presence)



Step	Direction										Message	Comment
	User A	UEA	ASA	IMSA	IBCFA	IBCFB	IMSB	ASB	UEB	User B		
36											OPTIONS	IMS_A forwards OPTIONS to IBCF_A
37											OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
38											OPTIONS	IBCF_B forwards OPTIONS to IMS_B
39											OPTIONS	IMS_B forwards OPTIONS to IBCF_B
40											OPTIONS	IBCF_B forwards OPTIONS to IBCF_A
41											OPTIONS	IBCF_A forwards OPTIONS to IMS_A
42											OPTIONS	IMS_A forwards OPTIONS to UE_B
43												User B is informed about user A capabilities
44											200 OK	UE_B responds with 200 OK to IMS_A with Contact header containing user B capabilities (RCS services Tags and the Tag indicating support of social presence)
45											200 OK	IMS_A forwards 200 OK to IBCF_A
46											200 OK	IBCF_A forwards 200 OK to IBCF_B
47											200 OK	IBCF_B forwards 200 OK to IMS_B
48											200 OK	IMS_B forwards 200 OK to IBCF_B
49											200 OK	IBCF_B forwards 200 OK to IBCF_A
50											200 OK	IBCF_A forwards 200 OK to IMS_A
51											200 OK	IMS_A forwards 200 OK to UE_A
52												User A is informed about user B capabilities
53												User A subscribes to presence information from User B
54											SUBSCRIBE	UE_A sends SUBSCRIBE for "User B presence" event to IMS_A
55											SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IBCF_A
56											SUBSCRIBE	IBCF_A forwards the SUBSCRIBE to IBCF_B
57											SUBSCRIBE	IBCF_B forwards the SUBSCRIBE to IMS_B
58											SUBSCRIBE	IMS_B forwards the SUBSCRIBE to IMS_B AS (PS)
59											200 OK	IMS_B AS responds with a 200 OK to IMS_B
60											200 OK	IMS_B forwards the 200 OK response to IBCF_B
61											200 OK	IBCF_B forwards the 200 OK response to IBCF_A
62											200 OK	IBCF_A forwards the 200 OK response to IMS_A
63											200 OK	IMS_A forwards the 200 OK response to UE_A



Step	Direction										Message	Comment
	User A	UEA	ASA	IMSA	IBCFA	IBCFB	IMSB	ASB	UEB	User B		
64						←					NOTIFY	IMS_B AS sends NOTIFY to IBCF_B with subscription state set to pending.
65					←						NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
66				←							NOTIFY	IBCF_A forwards NOTIFY to IMS_A
67		←									NOTIFY	IMS_A forwards the NOTIFY to UE_A
68		→		→							200 OK	UE_A responds with a 200 OK to IMS_A
69					→						200 OK	IMS_A forwards the 200 OK to IBCF_A
70						→					200 OK	IBCF_A forwards the 200 OK to IBCF_B
71								→			200 OK	IBCF_B forwards the 200 OK response to IMS_B AS
72												SUBSCRIPTION triggers the AS to send a NOTIFY to UE_B indicating the change to the watcher information subscriber
73							←				NOTIFY	IMS_B AS sends NOTIFY to IMS_B to indicate UE_B the change to the watcher information subscriber
74						←					NOTIFY	IMS_B forwards the NOTIFY to IBCF_B
75					←						NOTIFY	IBCF_B forwards the NOTIFY to IBCF_A
76				←							NOTIFY	IBCF_A forwards the NOTIFY to IMS_A
77				→	→	→	→	→	→		NOTIFY	IMS_A forwards the NOTIFY to UE_B
78				←	←	←	←	←	←		200 OK	UE_B responds with a 200 OK to IMS_A
79				→	→						200 OK	IMS_A forwards the 200 OK response to IBCF_A
80					→	→					200 OK	IBCF_A forwards the 200 OK response to IBCF_B
81						→	→					IBCF_B forwards the 200 OK response to IMS_B
82							→	→			200 OK	IMS_B forwards the 200 OK response to IMS_B AS
83												User B receives an authorization request from User A to see its own presence information
84												User B authorizes user A to be informed of its presence information
85						←					NOTIFY	IMS_B AS sends NOTIFY to IBCF_B with a subscription state set to active and an XML body containing User_B's presence information ("pidf+XML").
86					←						NOTIFY	IBCF_B sends NOTIFY to IBCF_A
87				←							NOTIFY	IBCF_A forwards NOTIFY to IMS_A
88		←									NOTIFY	IMS_A forwards the NOTIFY to UE_A
89		→		→							200 OK	UE_A responds with a 200 OK to IMS_A

Step	Direction										Message	Comment
	User A	UEA	ASA	IMSA	IBCFA	IBCFB	IMSB	ASB	UEB	User B		
90				→							200 OK	IMS_A forwards the 200 OK response to IBCF_A
91					→						200 OK	IBCF_A forwards the 200 OK response to IBCF_B
92						→	→				200 OK	IBCF_B forwards the 200 OK response to IMS_B AS
93												User A is informed of user B presence and capability information

4.5.2.2 Watcher subscription to presence event notification in home network

Interoperability Test Description		
Identifier:	TD_IMS_PRES_0002	
Summary:	IMS network supports properly presence service when a watcher subscribes to presence information for a presentity that it's located in a home network.	
Configuration:	CF_INT_AS	
SUT	IMS_A	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5108_07	TS 124 229 [1], clause 5.4.3.3 ¶1
	TP_IMS_5115_08	TS 124 229 [1], clause 5.4.3.3 ¶65
Use Case ref.:	UC_RCS_2_I	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User B publishes presence and capability information including capabilities
	2	User B is informed of its presence status update
	3	User A selects a contact of user B in the phone address book
	4	User B is informed about user A capabilities
	5	User A is informed about user B capabilities
	6	User A subscribes to presence and capability information from User B
	7	SUBSCRIPTION triggers the AS to send a NOTIFY to UE_B indicating the change to the watcher information subscriber
	8	User B receives an authorization request from User A to see its own presence and capability information
	9	User B authorizes user A to be informed of its own presence and capability information
	10	User A is informed of user B presence and capability information
	11	User A sees user B presence and capability information

Interoperability Test Description		
Conformance Criteria:	**Check**	
	1	TP_IMS_5108_07 in CFW step 21 (SUBSCRIBE): *ensure that {* *when { IUT receives a SUBSCRIBE from IMS_A addressed_to UE_B}* *then { IUT sends the SUBSCRIBE to AS_B* *containing a topmost Route_header* *indicating the SIP_URI of AS_B and* *containing a Route_header* *indicating the S-CSCF_SIP_URI of IUT_* *containing a P-Charging-Vector_header* *(containing an orig-ioi_parameter* *indicating IMS_A and* *not containing a term-ioi_parameter) }* *}*
	2	TP_IMS_5115_08 in CFW step 22 (200 OK): *ensure that {* *when { AS_B sends a 200 response to UE_A }* *then { IMS_B receives the 200 response* *containing a P-Charging-Vector_header* *containing a orig-ioi_parameter indicating IMS_A and* *containing a term-ioi_parameter indicating IMS_B }* *}*

Step	Direction										Message	Comment
	User A	UEA	ASA	IMSA	IBCFA	IBCFB	IMSB	ASB	UEB	User B		
1												User B publishes presence and capability information including capabilities
2							←		←		PUBLISH	UE_B sends PUBLISH with information for all commonly supported presence elements and capabilities
3							→	←			PUBLISH	IMS_B forwards the PUBLISH to IMS_B AS (PS)
4							←	→			200 OK	IMS_B AS responds with a 200 OK to IMS_B
5							→		→		200 OK	IMS_B forwards the 200 OK response to IBCF_B
6												User B is informed of its presence status update
7												User B subscribes to watcher event notification
8							←		←		SUBSCRIBE	UE_B sends a SUBSCRIBE to be informed of event watcher information (Event: presence.winfo)
9							→	←			SUBSCRIBE	IMS_B forwards the SUBSCRIBE to IMS_B AS (PS)
10							←	→			200 OK	IMS_B AS responds with a 200 OK to IMS_B
11							→		→		200 OK	IMS_B forwards the 200 OK response to IBCF_B
12							←	→			NOTIFY	IMS_B AS send a NOTIFY to IMS_B containing watcher info (XML body of "watcherinfo+XML").
13							→		→		NOTIFY	IMS_B forwards the NOTIFY response to UE_B
14							←		←		200 OK	UE_B sends 200 OK to the NOTIFY

Step	Direction										Message	Comment
	User A	UEA	ASA	IMSA	IBCFA	IBCFB	IMSB	ASB	UEB	User B		
15							→				200 OK	IMS_B forwards the 200 OK to IMS_B AS (PS)
16												User A selects a contact of user B in the phone address book
17		→	→								OPTIONS	UE_A sends OPTIONS to IMS_A with Accept-contact header containing user A capabilities (RCS services Tags and the Tag indicating support of social presence)
18				→							OPTIONS	IMS_A forwards OPTIONS to IBCF_A
19					→						OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
20						→					OPTIONS	IBCF_B forwards OPTIONS to IMS_B
21							→		→		OPTIONS	IMS_B forwards OPTIONS to UE_B
22												User B is informed about user A capabilities
23							←		←		200 OK	UE_B responds with 200 OK to IMS_B with Contact header containing user B capabilities (RCS services Tags and the Tag indicating support of social presence)
24						←					200 OK	IMS_B forwards 200 OK to IBCF_B
25					←						200 OK	IBCF_B forwards 200 OK to IBCF_A
26				←							200 OK	IBCF_A forwards 200 OK to IMS_A
27		←	←								200 OK	IMS_A forwards 200 OK to UE_A
28												User A is informed about user B capabilities
29												User A subscribes to presence information from User B
30		→	→								SUBSCRIBE	UE_A sends SUBSCRIBE for "User B presence" event to IMS_A
31				→							SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IBCF_A
32					→						SUBSCRIBE	IBCF_A forwards the SUBSCRIBE to IBCF_B
33						→					SUBSCRIBE	IBCF_B forwards the SUBSCRIBE to IMS_B
34							→				SUBSCRIBE	IMS_B forwards the SUBSCRIBE to IMS_B AS (PS)
35							←				200 OK	IMS_B AS responds with a 200 OK to IMS_B
36						←					200 OK	IMS_B forwards the 200 OK response to IBCF_B
37					←						200 OK	IBCF_B forwards the 200 OK response to IBCF_A
38				←							200 OK	IBCF_A forwards the 200 OK response to IMS_A
39		←	←								200 OK	IMS_A forwards the 200 OK response to UE_A
40						←					NOTIFY	IMS_B AS sends NOTIFY to IBCF_B indicating that the subscription is pending.

Step	Direction										Message	Comment
	User A	UEA	ASA	IMSA	IBCFA	IBCFB	IMSB	ASB	UEB	User B		
41					←						NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
42				←							NOTIFY	IBCF_A forwards NOTIFY to IMS_A
43		←									NOTIFY	IMS_A forwards the NOTIFY to UE_A
44			→								200 OK	UE_A responds with a 200 OK to IMS_A
45				→							200 OK	IMS_A forwards the 200 OK to IBCF_A
46					→						200 OK	IBCF_A forwards the 200 OK to IBCF_B
47						→					200 OK	IBCF_B forwards the 200 OK response to IMS_B AS
48												SUBSCRIPTION triggers the AS to send a NOTIFY to UE_B indicating the change to the watcher information subscriber
49							←				NOTIFY	IMS_B AS sends NOTIFY to IMS_B to indicate UE_B the change to the watcher information subscriber
50							→				NOTIFY	IMS_B forwards the NOTIFY to UE_B
51							←				200 OK	UE_B responds with a 200 OK to IMS_B
52							→				200 OK	IMS_B forwards the 200 OK response to IMS_B AS
53												User B receives an authorization request from User A to see its presence information
54												User B authorizes user A to be informed of its own presence and capability information (e.g. by sending a PUBLISH as in step 2).
55						←					NOTIFY	IMS_B AS sends NOTIFY to IBCF_B with a subscription state set to active and an XML body containing UE_B's presence information ("pidf+XML").
56					←						NOTIFY	IBCF_B sends NOTIFY to IBCF_A
57				←							NOTIFY	IBCF_A forwards NOTIFY to IMS_A
58		←									NOTIFY	IMS_A forwards the NOTIFY to UE_A
59			→								200 OK	UE_A responds with a 200 OK to IMS_A
60				→							200 OK	IMS_A forwards the 200 OK response to IBCF_A
61					→						200 OK	IBCF_A forwards the 200 OK response to IBCF_B
62						→					200 OK	IBCF_B forwards the 200 OK response to IMS_B AS
63												User A is informed of user B presence and capability information

4.5.2.3 Unsuccessful watcher subscription to presence event notification in home network

Interoperability Test Description		
Identifier:	TD_IMS_PRES_0003	
Summary:	IMS network supports properly presence service when a watcher subscribes to presence information for a presentity that it's located in a different network and does not authorize the watcher to be informed of his presence information.	
Configuration:	CF_INT_AS	
SUT	IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5108_07	TS 124 229 [1], clause 5.4.3.3 ¶1
Use Case ref.:	UC_RCS_2_I	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B optionally using userPRES according to table 1 • User A is not authorized to see presence information of User B • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User B publishes presence and capability information including capabilities
	2	User B is informed of its presence status update
	3	User A selects a contact of user B in the phone address book
	4	User B is informed about user A capabilities
	5	User A is informed about user B capabilities
	6	User A subscribes to presence and capability information from User B
	7	User A is not informed of user B presence information
Conformance Criteria:	**Check**	
	1	TP_IMS_5108_07 in CFW step 9 (SUBSCRIBE): *ensure that {* *when { IUT receives a SUBSCRIBE from IMS_A addressed_to UE_B}* *then { IUT sends the SUBSCRIBE to AS_B* *containing a topmost Route_header* *indicating the SIP_URI of AS_B and* *containing a Route_header* *indicating the S-CSCF_SIP_URI of IUT_* *containing a P-Charging-Vector_header* *(containing an orig-ioi_parameter* *indicating IMS_A and* *not containing a term-ioi_parameter) }* *}*

Step	Direction										Message	Comment
	User A	UE A	ASA	IMS A	IBCF A	IBCF B	IMS B	AS B	UE B	User B		
1												User B publishes presence and capability information including capabilities
2							←		←		PUBLISH	UE_B sends PUBLISH with information for all commonly supported presence elements and capabilities
3							→	←			PUBLISH	IMS_B forwards the PUBLISH to IMS_B AS (PS)
4							←				200 OK	IMS_B AS responds with a 200 OK to IMS_B
5							→		→		200 OK	IMS_B forwards the 200 OK response to IBCF_B
6												User B is informed of its presence status update
7												User B subscribes to watcher event notification
8							←		←		SUBSCRIBE	UE_B sends a SUBSCRIBE to be informed of event watcher information (Event: presence.winfo)
9							→	←			SUBSCRIBE	IMS_B forwards the SUBSCRIBE to IMS_B AS (PS)
10							←				200 OK	IMS_B AS responds with a 200 OK to IMS_B
11							→		→		200 OK	IMS_B forwards the 200 OK response to IBCF_B
12							←				NOTIFY	IMS_B AS send a NOTIFY to IMS_B containing watcher info (XML body of "watcherinfo+XML").
13							→		→		NOTIFY	IMS_B forwards the NOTIFY response to UE_B
14							←		←		200 OK	UE_B sends 200 OK to the NOTIFY
15							→	←			200 OK	IMS_B forwards the 200 OK to IMS_B AS (PS)
16												User A selects a contact of user B in the phone address book
17		→	→	→							OPTIONS	UE_A sends OPTIONS to IMS_A with Accept-contact header containing user A capabilities (RCS services Tags and the Tag indicating support of social presence)
18				→	→						OPTIONS	IMS_A forwards OPTIONS to IBCF_A
19					→	→					OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
20						→	→				OPTIONS	IBCF_B forwards OPTIONS to IMS_B
21							→		→		OPTIONS	IMS_B forwards OPTIONS to UE_B
22												User B is informed about user A capabilities
23							←		←		200 OK	UE_B responds with 200 OK to IMS_B with Contact header containing user B capabilities (RCS services Tags and the Tag indicating support of social presence)

Step	Direction										Message	Comment
	User A	UEA	ASA	IMSA	IBCFA	IBCFB	IMSB	ASB	UEB	User B		
24						←					200 OK	IMS_B forwards 200 OK to IBCF_B
25					←						200 OK	IBCF_B forwards 200 OK to IBCF_A
26				←							200 OK	IBCF_A forwards 200 OK to IMS_A
27		←									200 OK	IMS_A forwards 200 OK to UE_A
28												User A is informed about user B capabilities
29												User A subscribes to presence and capability information from User B
30		→		→							SUBSCRIBE	UE_A sends SUBSCRIBE for "User B presence" event to IMS_A
31				→							SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IBCF_A
32					→						SUBSCRIBE	IBCF_A forwards the SUBSCRIBE to IBCF_B
33						→					SUBSCRIBE	IBCF_B forwards the SUBSCRIBE to IMS_B
34							→				SUBSCRIBE	IMS_B forwards the SUBSCRIBE to IMS_B AS (PS)
35							←				2xx or 4xx response	IMS_B AS responds with a 2xx or 4xx response to IMS_B
36						←					2xx or 4xx response	IMS_B forwards the 2xx or 4xx response to IBCF_B
37					←						2xx or 4xx response	IBCF_B forwards the 2xx or 4xx response to IBCF_A
38				←							2xx or 4xx response	IBCF_A forwards the 2xx or 4xx response to IMS_A
39		←									2xx or 4xx response	IMS_A forwards the 2xx or 4xx response to UE_A
40												User A is not informed of user B presence information

4.5.2.4 Watcher subscription to resource list in visited network

Interoperability Test Description		
Identifier:	TD_IMS_PRES_0004	
Summary:	IMS network supports properly presence service when a watcher subscribes to a resource list containing one or more presentities located in different networks.	
Configuration:	CF_ROAM_AS (OPTIONAL)	
SUT	IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5097_13	TS 124 229 [1], clause 5.4.3.2 ¶1
	TP_IMS_5108_07	TS 124 229 [1], clause 5.4.3.3 ¶1
	TP_IMS_5313_01	TS 124 229 [1], clause 5.4.6.1.3 ¶2
Use Case ref.:	UC_RCS_3_R	

Interoperability Test Description		
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B via IMS_A optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • RLS and PS have previously exchanged capabilities • User A is authorized to access the presence info of User B • IMS_A is within the trust domain of IMS_B • IMS_A not configured for topology hiding • UE_A is authorized to use the resource list userPRES_list	
Test Sequence:	**Step**	
	1	User B publishes presence and capability information
	2	User B is informed of its presence status update
	3	User A subscribes to resource list previously stored in the User A client as XDMS list of contacts
	4	RLS performs authorization checks to ensure that User A is authorized to use resource lists
	5	RLS resolves watcher resource´s address and subscribes for presence event notification for all the presentities represented by the resource list SIP URI
	6	PS performs authorization checks on the originator to ensure it is allowed to watch the presentity
	7	RLS notifies with presence and capability information for all the presentities represented by the resource list SIP URI
	8	User A sees user B presence and capability information
Conformance Criteria:	**Check**	
	1	TP_IMS_5097_13 in CFW step 6 (PUBLISH): *ensure that {* *when { IUT receives a PUBLISH from IMS_A from UE_B }* *then {IUT sends the PUBLISH to AS_B* *containing a Route_header* *indicating the SIP_URI of AS_B and* *containing a P-Charging-Function-Addresses_header and* *containing a P-Charging-Vector_header* *(containing an orig-ioi_parameter* *indicating IMS_A and* *not containing a term-ioi_parameter and* *containing an access-network-charging-info_parameter) }* *}*
	2	TP_IMS_5108_07 in CFW step 49 (SUBSCRIBE): *ensure that {* *when { IUT receives a SUBSCRIBE from IMS_A addressed_to UE_B}* *then { IUT sends the SUBSCRIBE to AS_B* *containing a topmost Route_header* *indicating the SIP_URI of AS_B and* *containing a Route_header* *indicating the S-CSCF_SIP_URI of IUT_* *containing a P-Charging-Vector_header* *(containing an orig-ioi_parameter* *indicating IMS_A and* *not containing a term-ioi_parameter) }* *}*

Interoperability Test Description		
	3	TP_IMS_5313_01 in CFW step 55 (200 OK) *ensure that {* *when { IMS_A receives a response from IMS_B* *containing a P-Charging-Vector_header* *including an access-network-charging-info_parameter* *}* *then { IMS_A sends the response to AS_A* *containing a P-Charging-Vector_header* *including an access-network-charging-info_parameter* *}}*

Step	Direction										Message	Comment
	User A	**UEA**	**ASA**	**IMSA**	**IBCFA**	**IBCFB**	**IMSB**	**ASB**	**UEB**	**User B**		
1												User B publishes presence and capability information
2				←					←		PUBLISH	UE_B sends PUBLISH with information for all commonly supported presence and capability elements
3				→	→						PUBLISH	IMS_A forwards the PUBLISH to IBCF_A
4					→	→					PUBLISH	IBCF_A forwards the PUBLISH to IBCF_B
5						→	→				PUBLISH	IBCF_B forwards the PUBLISH to IMS_B
6							→	→			PUBLISH	IMS_B forwards the PUBLISH to IMS_B AS (PS)
7							←	←			200 OK	IMS_B AS responds with a 200 OK to IMS_B
8						←	←				200 OK	IMS_B forwards the 200 OK response to IBCF_B
9					←	←					200 OK	IBCF_B forwards the 200 OK response to IBCF_A
10				←	←						200 OK	IBCF_A forwards the 200 OK response to IMS_A
11				→					→		200 OK	IMS_A forwards the 200 OK response to UE_B
12												User B is informed of its presence status update
13												User B subscribes to be informed of watcher information**.**
14				←					←		SUBSCRIBE	UE_B sends a SUBSCRIBE to be informed of event watcher information (Event: presence.winfo)
15				→	→						SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IBCF_A
16					→	→					SUBSCRIBE	IBCF_A forwards the SUBSCRIBE to IBCF_B
17						→	→				SUBSCRIBE	IBCF_B forwards the SUBSCRIBE to IMS_B
18							→	→			SUBSCRIBE	IMS_B forwards the SUBSCRIBE to IMS_B AS (PS)
19							←	←			200 OK	IMS_B AS responds with a 200 OK to IMS_B
20						←	←				200 OK	IMS_B forwards the 200 OK response to IBCF_B
21					←	←					200 OK	IBCF_B forwards the 200 OK response to IBCF_A

Step	Direction										Message	Comment
	User A	UEA	ASA	IMSA	IBCFA	IBCFB	IMSB	ASB	UEB	User B		
22				←							200 OK	IBCF_A forwards the 200 OK response to IMS_A
23									→		200 OK	IMS_A forwards the 200 OK response to UE_B
24							←				NOTIFY	IMS_B AS send a NOTIFY to IMS_B containing watcher info (XML body of "watcherinfo+XML").
25						←					NOTIFY	IMS_B forwards the NOTIFY response to IBCF_B
26					←						NOTIFY	IBCF_B forwards the NOTIFY response to IBCF_A
27				←							NOTIFY	IBCF_A forwards the NOTIFY response to IMS_A
28									→		NOTIFY	IMS_A forwards the NOTIFY response to UE_B
29									←		200 OK	UE_B sends a 200 OK to the NOTIFY
30				→							200 OK	IMS_A forwards the 200 OK to IBCF_A
31					→						200 OK	IBCF_A forwards the 200 OK to IBCF_B
32						→					200 OK	IBCF_B forwards the 200 OK to IMS_B
33							→				200 OK	IMS_B forwards the 200 OK to IMS_B AS (PS)
34												User A subscribes to resource list previously stored in the User A client as XDMS list of contacts
35		→	→								SUBSCRIBE	UE_A sends ANONYMOUS SUBSCRIBE for "presence" event with expiry time of 0 to IMS_A indicating support to "eventlist" to a resource list SIP URI
36			←								SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IMS_A AS (RLS)
37												RLS performs authorization checks to ensure that User A is authorized to use resource lists
38			→								200 OK	IMS_A AS responds with a 200 OK to IMS_A
39		←									200 OK	IMS_A forwards the 200 OK response to UE_A
40			→								NOTIFY	IMS_A AS sends NOTIFY to IMS_A
41		←									NOTIFY	IMS_A forwards the NOTIFY to UE_A
42		→									200 OK	UE_A responds with a 200 OK to IMS_A
43			←								200 OK	IMS_A forwards the 200 OK response to IMS_A AS

Step	Direction										Message	Comment
	User A	UE A	ASA	IMSA	IBCFA	IBCFB	IMSB	ASB	UE B	User B		
44												RLS resolves watcher resource´s address and subscribes for presence event notification for all the presentities represented by the resource list SIP URI
45			→								SUBSCRIBE	IMS_A AS (RLS) sends SUBSCRIBE for "presence" event to IMS_A
46				→							SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IBCF_A
47					→						SUBSCRIBE	IBCF_A forwards the SUBSCRIBE to IBCF_B
48						→					SUBSCRIBE	IBCF_B forwards the SUBSCRIBE to IMS_B
49							→				SUBSCRIBE	IMS_B forwards the SUBSCRIBE to IMS_B AS (PS)
50												PS performs authorization checks on the originator to ensure it is allowed to watch the presentity
51							←				200 OK	IMS_B AS (PS) responds with a 200 OK to IMS_B
52						←					200 OK	IMS_B forwards the 200 OK response to IBCF_B
53					←						200 OK	IBCF_B forwards the 200 OK response to IBCF_A
54				←							200 OK	IBCF_A forwards the 200 OK response to IMS_A
55			←								200 OK	IMS_A forwards the 200 OK response to IMS_A AS (RLS)
56						←					NOTIFY	IMS_B AS sends a NOTIFY to IBCF_B with the presence and capability information of UE_B in XML body ("pidf+XML").
57					←						NOTIFY	IBCF_B forwards the NOTIFY to IBCF_A
58				←								IBCF_A forwards the NOTIFY to IMS_A
59			←								NOTIFY	IMS_A forwards the NOTIFY to IMS_A AS (RLS)
60			→								200 OK	IMS_A AS responds with a 200 OK to IMS_A
61				→							200 OK	IMS_A forwards the 200 OK response to IBCF_A
62					→						200 OK	IBCF_A forwards the 200 OK response to IBCF_B
63						→					200 OK	IBCF_B forwards the 200 OK response to IMS_B AS
64												RLS notifies with presence and capability information for all the presentities represented by the resource list SIP URI

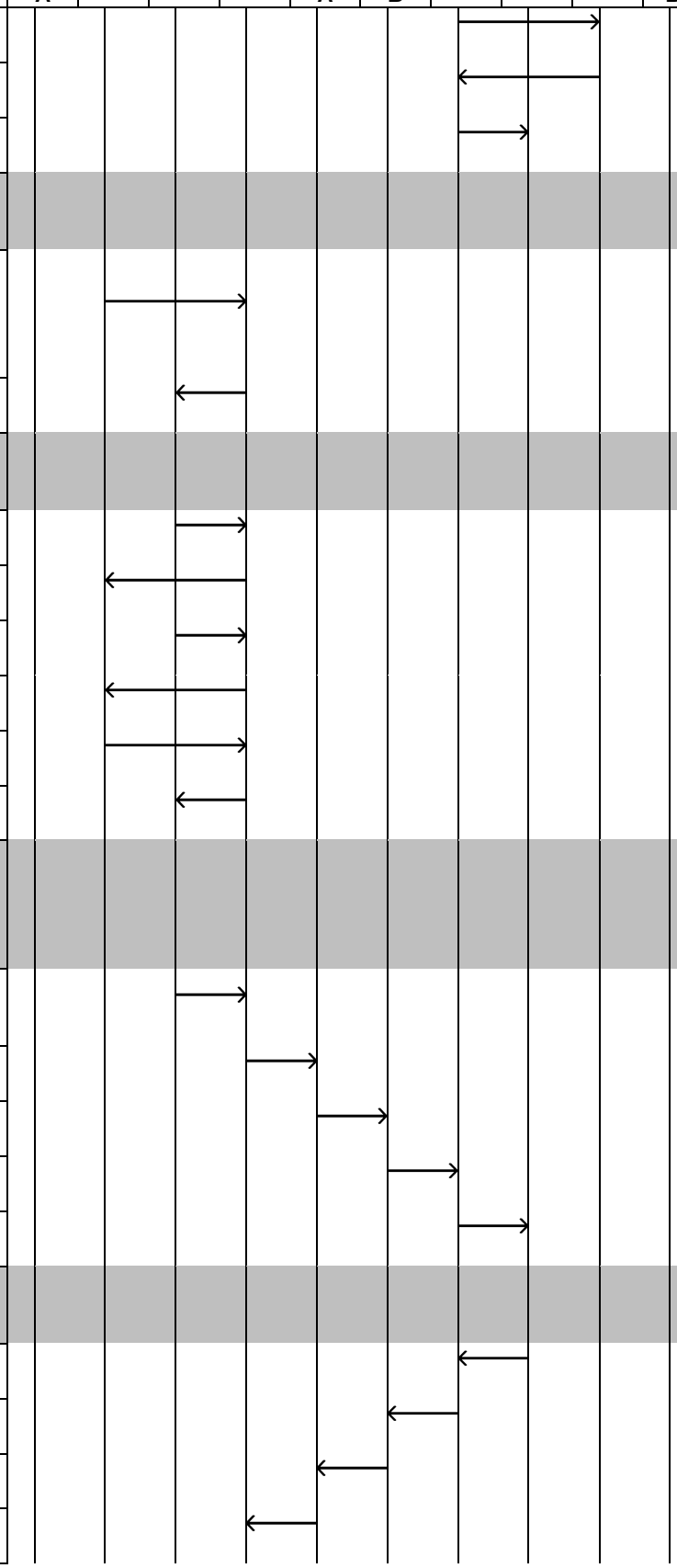
Step	Direction										Message	Comment
	User A	UEA	ASA	IMSA	IBCFA	IBCFB	IMSB	ASB	UEB	User B		
65			→								NOTIFY	IMS_A AS sends NOTIFY to IMS_A
66		←									NOTIFY	IMS_A forwards the NOTIFY to UE_A
67			→								200 OK	UE_A responds with a 200 OK to IMS_A
68			←								200 OK	IMS_A forwards the 200 OK response to IMS_A AS
69												User A sees presence and capability information of the list of users.

4.5.2.5 Watcher subscription to resource list in home network

Interoperability Test Description		
Identifier:	TD_IMS_PRES_0005	
Summary:	IMS network supports properly presence service when a watcher subscribes to a resource list containing one or more presentities located in different networks.	
Configuration:	CF_INT_AS	
SUT	IMS_A	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5108_07	TS 124 229 [1], clause 5.4.3.3 ¶1
	TP_IMS_5313_01	TS 124 229 [1], clause 5.4.6.1.3 ¶2
Use Case ref.:	UC_RCS_3_I	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • IMS_A not configured for topology hiding • UE_A is authorized to use the resource list userPRES_list	
Test Sequence:	**Step**	
	1	User B publishes presence and capability information
	2	User B is informed of its presence status update
	3	User A subscribes to resource list previously stored in the User A client as XDMS list of contacts
	4	RLS performs authorization checks to ensure that User A is authorized to use resource lists
	5	RLS resolves watcher resource´s address and subscribes for presence event notification for all the presentities represented by the resource list SIP URI
	6	PS performs authorization checks on the originator to ensure it is allowed to watch the presentity
	7	RLS notifies with presence and capability information for all the presentities represented by the resource list SIP URI
	8	User A sees user B presence and capability information

Interoperability Test Description		
Conformance Criteria:	**Check**	
	1	TP_IMS_5108_07 in CFW step 31 (SUBSCRIBE): *ensure that {* *when { IUT receives a SUBSCRIBE from IMS_A addressed_to UE_B}* *then { IUT sends the SUBSCRIBE to AS_B* *containing a topmost Route_header* *indicating the SIP_URI of AS_B and* *containing a Route_header* *indicating the S-CSCF_SIP_URI of IUT_* *containing a P-Charging-Vector_header* *(containing an orig-ioi_parameter* *indicating IMS_A and* *not containing a term-ioi_parameter) }* *}*
	2	TP_IMS_5313_01 in CFW step 37 (200 OK) *ensure that {* *when { IMS_A receives a response from IMS_B* *containing a P-Charging-Vector_header* *including an access-network-charging-info_parameter* *}* *then { IMS_A sends the response to AS_A* *containing a P-Charging-Vector_header* *including an access-network-charging-info_parameter* *}* *}*

Step	Direction										Message	Comment
	User A	UE A	ASA	IMS A	IBCF A	IBCF B	IMS B	AS B	UE B	User B		
1												User B publishes presence and capability information
2							←		←		PUBLISH	UE_B sends PUBLISH with information for all commonly supported presence and capability elements
3							→	←			PUBLISH	IMS_B forwards the PUBLISH to IMS_B AS (PS)
4							←	→			200 OK	IMS_B AS responds with a 200 OK to IMS_B
5							→		→		200 OK	IMS_B forwards the 200 OK response to UE_B
6												User B is informed of its presence status update
7												User B subscribes to watcher event notification
8							←		←		SUBSCRIBE	UE_B sends a SUBSCRIBE to be informed of event watcher information (Event: presence.winfo)
9							→	←			SUBSCRIBE	IMS_B forwards the SUBSCRIBE to IMS_B AS (PS)
10							←	→			200 OK	IMS_B AS responds with a 200 OK to IMS_B
11							→		→		200 OK	IMS_B forwards the 200 OK response to IBCF_B
12							←	→			NOTIFY	IMS_B AS send a NOTIFY to IMS_B containing watcher info (XML body of "watcherinfo+XML").



Step	Message	Comment
13	NOTIFY	IMS_B forwards the NOTIFY response to UE_B
14	200 OK	UE_B sends 200 OK to the NOTIFY
15	200 OK	IMS_B forwards the 200 OK to IMS_B AS (PS)
16		User A subscribes to resource list previously stored in the User A client as XDMS list of contacts
17	SUBSCRIBE	UE_A sends ANONYMOUS SUBSCRIBE for "presence" event with expiry time of 0 to IMS_A indicating support to "eventlist" to a resource list SIP URI
18	SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IMS_A AS (RLS)
19		RLS performs authorization checks to ensure that User A is authorized to use resource lists
20	200 OK	IMS_A AS responds with a 200 OK to IMS_A
21	200 OK	IMS_A forwards the 200 OK response to UE_A
22	NOTIFY	IMS_A AS sends NOTIFY to IMS_A
23	NOTIFY	IMS_A forwards the NOTIFY to UE_A
24	200 OK	UE_A responds with a 200 OK to IMS_A
25	200 OK	IMS_A forwards the 200 OK response to IMS_A AS
26		RLS resolves watcher resource´s address and subscribes for presence event notification for all the presentities represented by the resource list SIP URI
27	SUBSCRIBE	IMS_A AS (RLS) sends SUBSCRIBE for "presence" event to IMS_A
28	SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IBCF_A
29	SUBSCRIBE	IBCF_A forwards the SUBSCRIBE to IBCF_B
30	SUBSCRIBE	IBCF_B forwards the SUBSCRIBE to IMS_B
31	SUBSCRIBE	IMS_B forwards the SUBSCRIBE to IMS_B AS (PS)
32		PS performs authorization checks on the originator to ensure it is allowed to watch the presentity
33	200 OK	IMS_B AS (PS) responds with a 200 OK to IMS_B
34	200 OK	IMS_B forwards the 200 OK response to IBCF_B
35	200 OK	IBCF_B forwards the 200 OK response to IBCF_A
36	200 OK	IBCF_A forwards the 200 OK response to IMS_A

Step	Direction										Message	Comment
	User A	UEA	ASA	IMSA	IBCFA	IBCFB	IMSB	ASB	UEB	User B		
37			←								200 OK	IMS_A forwards the 200 OK response to IMS_A AS (RLS)
38						←					NOTIFY	IMS_B AS sends a NOTIFY to IBCF_B with the presence and capability information of UE_B
39					←						NOTIFY	IBCF_B forwards the NOTIFY to IBCF_A
40				←								IBCF_A forwards the NOTIFY to IMS_A
41			←								NOTIFY	IMS_A forwards the NOTIFY to IMS_A AS (RLS)
42			→								200 OK	IMS_A AS responds with a 200 OK to IMS_A
43				→							200 OK	IMS_A forwards the 200 OK response to IBCF_A
44					→						200 OK	IBCF_A forwards the 200 OK response to IBCF_B
45						→					200 OK	IBCF_B forwards the 200 OK response to IMS_B AS
46												RLS notifies with presence and capability information for all the presentities represented by the resource list SIP URI
47			→								NOTIFY	IMS_A AS sends NOTIFY to IMS_A
48		←									NOTIFY	IMS_A forwards the NOTIFY to UE_A
49		→									200 OK	UE_A responds with a 200 OK to IMS_A
50			←								200 OK	IMS_A forwards the 200 OK response to IMS_A AS
51												User A sees presence and capability information for the list of users.

4.5.3 IM/Chat service

4.5.3.1 1-to-1 chat standard procedure

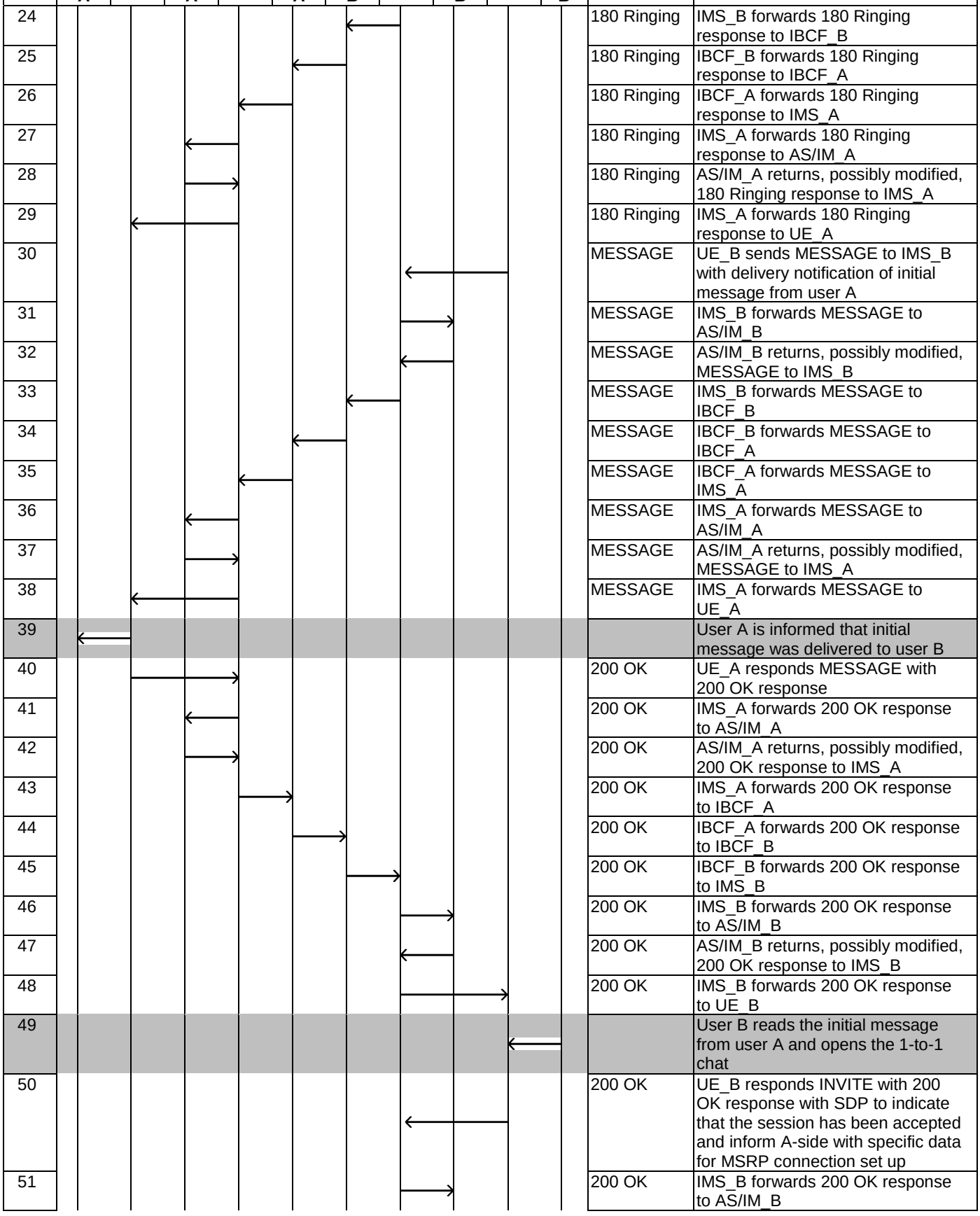
4.5.3.1.1 1-to-1 chat standard procedure - interworking

Interoperability Test Description		
Identifier:	TD_IMS_CHAT_0001	
Summary:	IMS network supports 1-to-1 IM/Chat service and messages exchange between two users in their home network can be performed.	
Configuration:	CF_INT_AS	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5097_01	TS 124 229 [1], clause 5.4.3.2 ¶11 (1st numbered list)

Interoperability Test Description		
	TP_IMS_5108_03	TS 124 229 [1], clause 5.4.3.3 ¶5 (item 4 in 1st numbered list)
	TP_IMS_5115_08	TS 124 229 [1], clause 5.4.3.3 ¶89 (4th numbered list)
	TD_MSRP_CHAT_0001	RFC 4975 [8], clauses 5.4, 7.1 and 7.2
Use Case ref.:	UC_RCS_4_I & UC_MSRP_01	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A and UE_B shall support MSRP • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User A selects User B in the phone address book and sends him an initial message with MSRP indication
	2	User B is informed of incoming message
	3	User A is informed that initial message was delivered to user B
	4	User B reads the initial message from user A and opens the 1-to-1 chat
	5	Users perform chatting (MSRP session)
	6A	User A closes the 1-to-1 chat
	6B	User B closes the 1-to-1 chat
	7A	User A is informed that 1-to-1 chat with user B is closed
	7B	User B is informed that 1-to-1 chat with user A is closed
Conformance Criteria:	**Check**	
	1	TP_IMS_5097_01 in CFW step 10 (INVITE): *ensure that {* *when { UE_A sends an initial INVITE to UE_B }* *then { IMS_B receives the initial INVITE* *not containing a Route_header* *indicating the S-CSCF_SIP_URI of IMS_A* *containing a P-Charging-Vector_header* *(containing an icid-value_parameter and* *containing a orig-ioi_parameter indicating IMS_A and* *not containing an access-network-charging-info_parameter and* *not containing a term-ioi_parameter) and* *containing a Record-Route_header* *indicating the originating S-CSCF_SIP_URI }* *}*
	2	TP_IMS_5108_03 in CFW step 14 (INVITE) *ensure that {* *when { IUT receives an initial INVITE from IMS_A addressed_to UE_B}* *then { IUT sends the INVITE to AS_B* *containing a topmost Route_header* *indicating the SIP_URI of AS_B and* *containing a Route_header* *indicating the S-CSCF_SIP_URI of IUT_* *containing a P-Charging-Vector_header* *(containing an orig-ioi_parameter* *indicating IMS_A and* *not containing a term-ioi_parameter) }* *}*

Interoperability Test Description		
	3	TP_IMS_5115_08 in CFW step 35 (200 OK) *ensure that {* *when { IMS_B receives 200_response from AS_B addressed to UE_A }* *then { IMS_B sends the 200_response to IMS_A* *containing a P-Charging-Vector_header* *including a orig-ioi_parameter* *indicating operator_identifier of IMS_A and* *including a term-ioi_parameter* *indicating operator_identifier of IMS_B }* *}*

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
1												User A selects User B in the phone address book and sends him an initial message
2											INVITE	UE_A sends INVITE to IMS_A with user A initial message in the Subject header, CPIM/IMND headers and the first SDP offer indicating all specific data for MSRP connection set up (CheckMSRP1)
3											100 Trying	IMS_A responds with a 100 Trying provisional response
4											INVITE	IMS_A forwards INVITE to AS/IM_A
5											100 Trying	AS/IM_A responds with a 100 Trying provisional response
6											INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
7											100 Trying	IMS_A responds with a 100 Trying provisional response
8											INVITE	IMS_A forwards INVITE to IBCF_A
9											100 Trying	IBCF_A responds with a 100 Trying provisional response
10											INVITE	IBCF_A forwards INVITE to IBCF_B
11											100 Trying	IBCF_B responds with a 100 Trying provisional response
12											INVITE	IBCF_B forwards INVITE to IMS_B
13											100 Trying	IMS_B responds with a 100 Trying provisional response
14											INVITE	IMS_B forwards INVITE to AS/IM_B
15											100 Trying	AS/IM_B responds with a 100 Trying provisional response
16											INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
17											100 Trying	IMS_B responds with a 100 Trying provisional response
18											INVITE	IMS_B forwards INVITE to UE_B
19											100 Trying	UE_B optionally responds with a 100 Trying provisional response
20												User B is informed of incoming message
21											180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that invitation to a 1-to-1 chat session has reached the invited user
22											180 Ringing	IMS_B forwards 180 Ringing response to AS/IM_B
23											180 Ringing	AS/IM_B returns, possibly modified, 180 Ringing response to IMS_B



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
24						←					180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
25					←						180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
26				←							180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
27			←								180 Ringing	IMS_A forwards 180 Ringing response to AS/IM_A
28			→								180 Ringing	AS/IM_A returns, possibly modified, 180 Ringing response to IMS_A
29		←									180 Ringing	IMS_A forwards 180 Ringing response to UE_A
30							←				MESSAGE	UE_B sends MESSAGE to IMS_B with delivery notification of initial message from user A
31							→				MESSAGE	IMS_B forwards MESSAGE to AS/IM_B
32							←				MESSAGE	AS/IM_B returns, possibly modified, MESSAGE to IMS_B
33						←					MESSAGE	IMS_B forwards MESSAGE to IBCF_B
34					←						MESSAGE	IBCF_B forwards MESSAGE to IBCF_A
35				←							MESSAGE	IBCF_A forwards MESSAGE to IMS_A
36			←								MESSAGE	IMS_A forwards MESSAGE to AS/IM_A
37			→								MESSAGE	AS/IM_A returns, possibly modified, MESSAGE to IMS_A
38		←									MESSAGE	IMS_A forwards MESSAGE to UE_A
39	←											User A is informed that initial message was delivered to user B
40		→									200 OK	UE_A responds MESSAGE with 200 OK response
41			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
42			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
43				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
44					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
45						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
46							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
47							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
48							→				200 OK	IMS_B forwards 200 OK response to UE_B
49									←			User B reads the initial message from user A and opens the 1-to-1 chat
50							←				200 OK	UE_B responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform A-side with specific data for MSRP connection set up
51							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
52											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
53											200 OK	IMS_B forwards 200 OK response to IBCF_B
54											200 OK	IBCF_B forwards 200 OK response to IBCF_A
55											200 OK	IBCF_A forwards 200 OK response to IMS_A
56											200 OK	IMS_A forwards 200 OK response to AS/IM_A
57											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
58											200 OK	IMS_A forwards 200 OK response to UE_A (CheckMSRP2)
59											ACK	UE_A acknowledges the receipt of 200 OK for INVITE
60											ACK	IMS_A forwards ACK to AS/IM_A
61											ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
62											ACK	IMS_A forwards ACK to IBCF_A
63											ACK	IBCF_A forwards ACK to IBCF_B
64											ACK	IBCF_B forwards ACK to IMS_B
65											ACK	IMS_B forwards ACK to AS/IM_B
66											ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
67											ACK	IMS_B forwards ACK to UE_B
68												Users perform chatting (see clause 5.3.1 Chat 1 to 1 via MSRP and use 5.4.1 test description) - CheckMSRP2
69A												User A closes the 1-to-1 chat
70A											BYE	UE_A releases the 1-to-1 chat session with BYE
71A											BYE	IMS_A forwards BYE to AS/IM_A
72A											BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
73A											BYE	IMS_A forwards BYE to IBCF_A
74A											BYE	IBCF_A forwards BYE to IBCF_B
75A											BYE	IBCF_B forwards BYE to IMS_B
76A											BYE	IMS_B forwards BYE to AS/IM_B
77A											BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
78A											BYE	IMS_B forwards BYE to UE_B
79A											200 OK	UE_B sends 200 OK for BYE
80A											200 OK	IMS_B forwards 200 OK response to AS/IM_B
81A											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
82A											200 OK	IMS_B forwards 200 OK response to IBCF_B
83A											200 OK	IBCF_B forwards 200 OK response to IBCF_A
84A											200 OK	IBCF_A forwards 200 OK response to IMS_A
85A											200 OK	IMS_A forwards 200 OK response to AS/IM_A
86A											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
87A		←	←	←							200 OK	IMS_A forwards 200 OK response to UE_A
88A	←	←										User A is informed that 1-to-1 chat with user B is closed
69B									←			User B close the 1-to-1 chat
70B							←	←			BYE	UE_B releases the 1-to-1 chat session with BYE
71B							→				BYE	IMS_B forwards BYE to AS/IM_B
72B							←				BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
73B						←					BYE	IMS_B forwards BYE to IBCF_B
74B					←						BYE	IBCF_B forwards BYE to IBCF_A
75B				←							BYE	IBCF_A forwards BYE to IMS_A
76B			←								BYE	IMS_A forwards BYE to AS/IM_A
77B			→								BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
78B		←									BYE	IMS_A forwards BYE to UE_A
79B		→									200 OK	UE_A sends 200 OK for BYE
80B			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
81B			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
82B				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
83B					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
84B						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
85B							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
86B							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
87B							→				200 OK	IMS_B forwards 200 OK response to UE_B
88B									→			User B is informed that that 1-to-1 chat with user A is closed

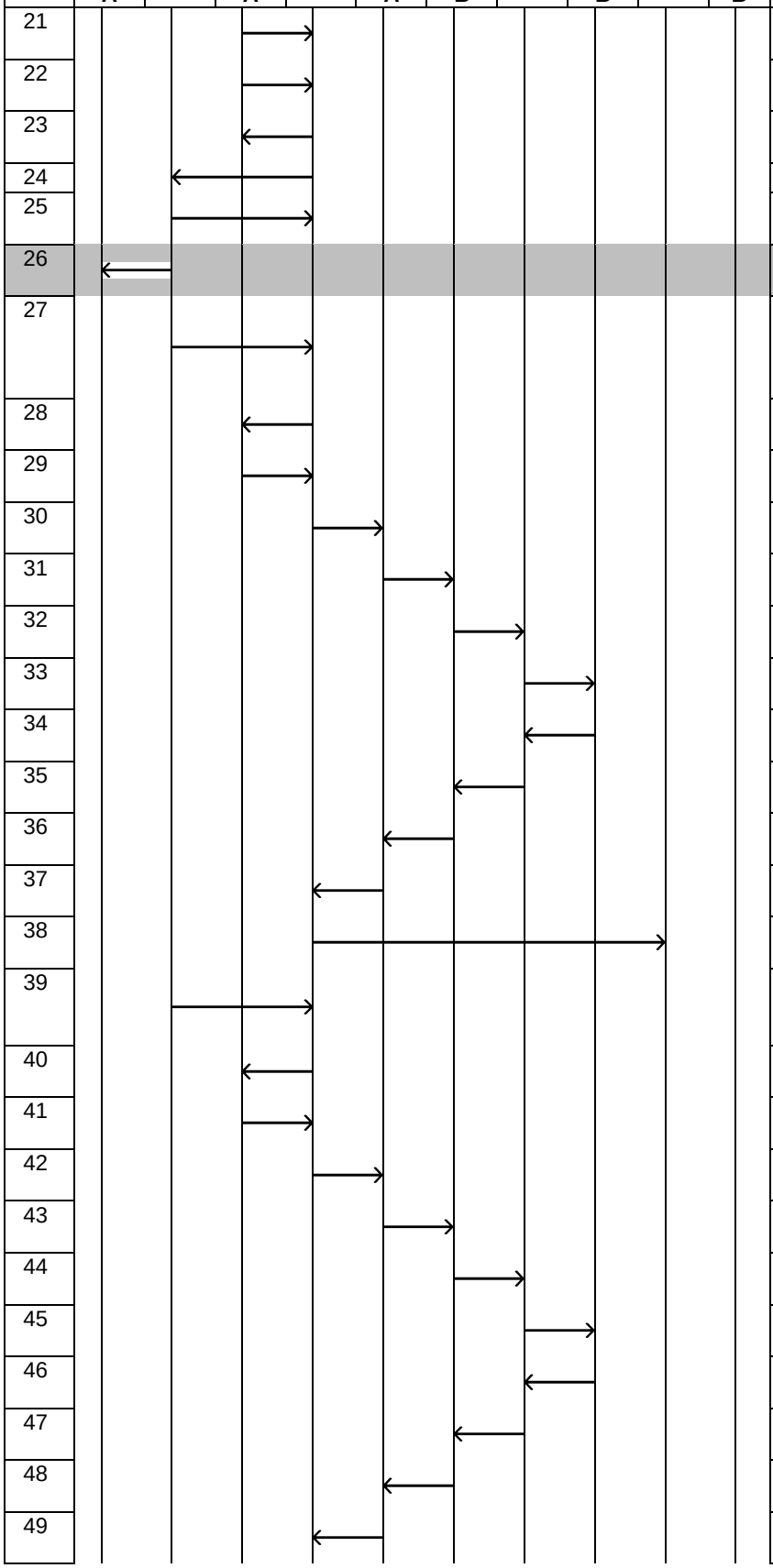
4.5.3.1.2 1-to-1 chat standard procedure - roaming (optional)

Interoperability Test Description		
Identifier:	TD_IMS_CHAT_0002	
Summary:	IMS network supports 1-to-1 IM/Chat service and messages exchange between two users, one user in its home network and one user roaming can be performed.	
Configuration:	CF_ROAM_AS (OPTIONAL)	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5046_01	TS 124 229 [1], clause 5.2.6.3.3 ¶1 (1st numbered list)
	TP_IMS_5067_01	TS 124 229 [1], clause 5.2.7.2 ¶5
	TP_IMS_5097_09	TS 124 229 [1], clause 5.4.3.2 ¶11 (items 5 and 8 in 1st numbered list)
	TD_MSRP_CHAT_0001	RFC 4975 [8], clauses 5.4, 7.1 and 7.2
Use Case ref.:	UC_RCS_4_R & UC_MSRP_01	

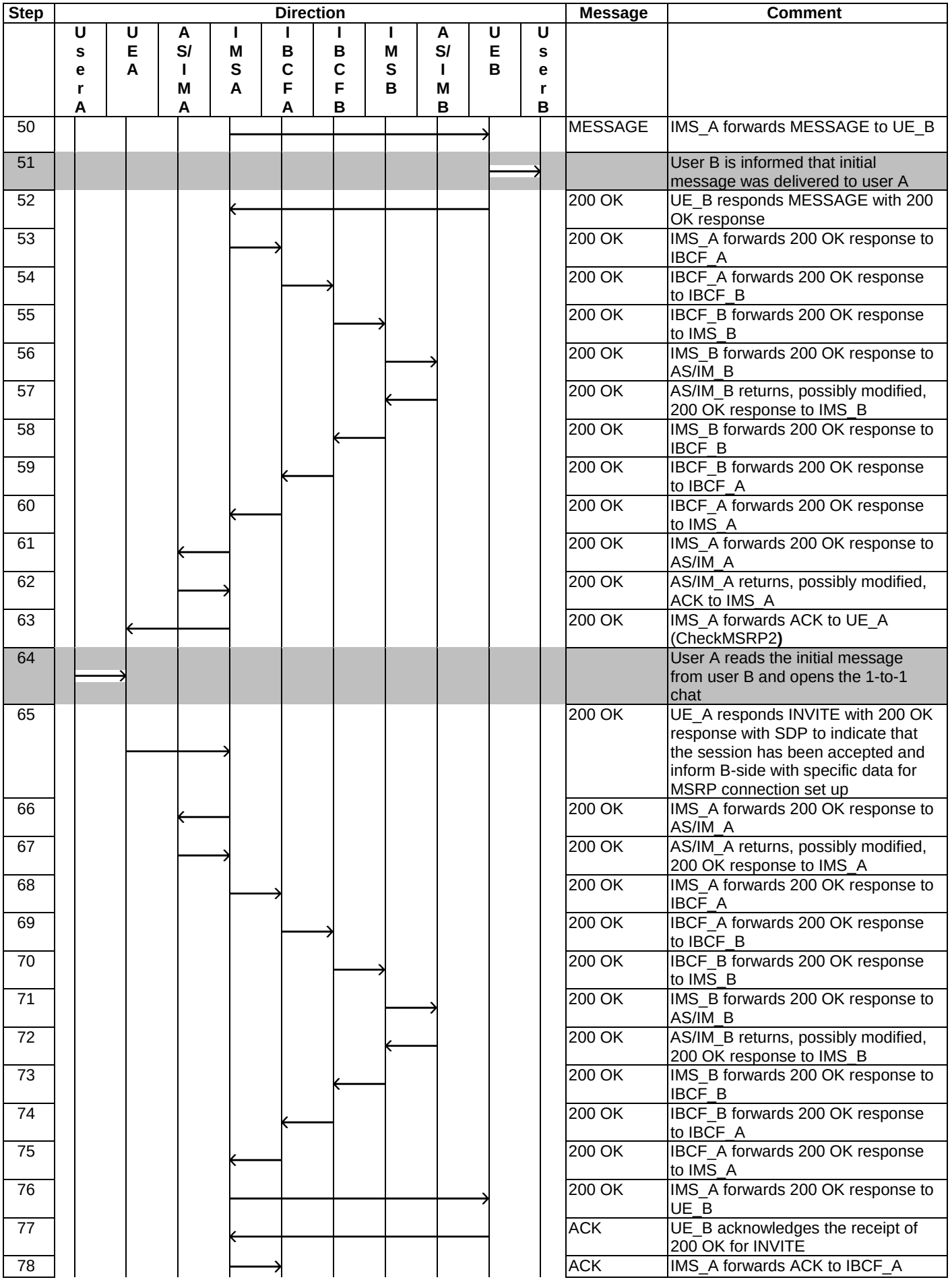
Interoperability Test Description		
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A and UE_B shall support MSRP • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B via IMS_A optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User B selects User A in the phone address book and sends him an initial message with MSRP indication
	2	User A is informed of incoming message
	3	User B is informed that initial message was delivered to user A
	4	User A reads the initial message from user B and opens the 1-to-1 chat
	5	Users perform chatting (MSRP session)
	6A	User B closes the 1-to-1 chat
	6B	User A closes the 1-to-1 chat
	7A	User B is informed that that 1-to-1 chat with user A is closed
	7B	User A is informed that that 1-to-1 chat with user B is closed
Conformance Criteria:	**Check**	
	1	TP_IMS_5046_01 in CFW step 6 (INVITE) *ensure that {* *when { IMS_A receives an initial INVITE from UE_B }* *then { IMS_A sends the INVITE to IMS_B* *containing a Route_header* *not indicating the P-CSCF_SIP_URI of IMS_A and* *containing a Route_header* *indicating the "list of Service Route header URIs* *from the registration" and* *containing an additional Via_header* *containing (the P-CSCF_via_port_number and* *(the P-CSCF-FQDN_address or* *the P-CSCF-IP_address)) of IMS_A and* *containing an additional topmost Record-Route_header* *indicating (the P-CSCF_port_number* *'where it awaits subsequent requests' from UE_A and* *(the P-CSCF-FQDN_address or* *the P-CSCF-IP_address)) of IMS_A and* *not containing P-Preferred-Identity_header and* *containing a P-Asserted-Identity_header* *containing an address of UE_B and* *containing a P-Charging-Vector_header* *containing an icid-value_parameter }* *}*

Interoperability Test Description		
	2	TP_IMS_5067_01 in CFW step 6 (INVITE) *ensure that {* *when { IMS_A receives an initial INVITE from UE_B }* *then { IMS_A sends the INVITE to IMS_B* *containing a P-Charging-Vector_header* *}* *}*
	3	TP_IMS_5097_09 in CFW step 10 (INVITE) *ensure that {* *when { IUT receives an initial INVITE from IMS_A addressed_to UE_A }* *then { IUT sends the initial INVITE to AS_B* *containing a Route_header* *indicating the SIP_URI of AS_B and* *containing a P-Charging-Function-Addresses_header and* *containing a P-Charging-Vector_header* *(containing an orig-ioi_parameter* *indicating IMS_A and* *not containing a term-ioi_parameter and* *containing an access-network-charging-info_parameter) }* *}*

Step	Direction										Message	Comment
	User A	UE A	AS/ IMA	IMS A	IBCF A	IBCF B	IMS B	AS/ IMB	UE B	User B		
1									←			User B selects User A in the phone address book and sends him an initial message
2				←							INVITE	UE_B sends INVITE to IMS_A with user B initial message in the Subject header, CPIM/IMND headers and the first SDP offer indicating all specific data for MSRP connection set up
3									→		100 Trying	IMS_A responds with a 100 Trying provisional response
4				→							INVITE	IMS_A forwards INVITE to IBCF_A
5				←							100 Trying	IBCF_A responds with a 100 Trying provisional response
6					→						INVITE	IBCF_A forwards INVITE to IBCF_B
7					←						100 Trying	IBCF_B responds with a 100 Trying provisional response
8						→					INVITE	IBCF_B forwards INVITE to IMS_B
9						←					100 Trying	IMS_B responds with a 100 Trying provisional response
10							→				INVITE	IMS_B forwards INVITE to AS/IM_B
11							←				100 Trying	AS/IM_B responds with a 100 Trying provisional response
12							←				INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
13								→			100 Trying	IMS_B responds with a 100 Trying provisional response
14						←					INVITE	IMS_B forwards INVITE to IBCF_B
15						→					100 Trying	IBCF_B responds with a 100 Trying provisional response
16					←						INVITE	IBCF_B forwards INVITE to IBCF_A
17					→						100 Trying	IBCF_A responds with a 100 Trying provisional response
18				←							INVITE	IBCF_A forwards INVITE to IMS_A
19				→							100 Trying	IMS_A responds with a 100 Trying provisional response
20			←								INVITE	IMS_A forwards INVITE to AS/IM_A



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
21			→	→							100 Trying	AS/IM_A responds with a 100 Trying provisional response
22			→	→							INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
23			←	←							100 Trying	IMS_A responds with a 100 Trying provisional response
24		←		←							INVITE	IMS_A forwards INVITE to UE_A
25		→		→							100 Trying	UE_A optionally responds with a 100 Trying provisional response
26	←	←										User A is informed of incoming message
27		→		→							180 Ringing	UE_A responds to initial INVITE with 180 Ringing to indicate that invitation to a 1-to-1 chat session has reached the invited user
28			←	←							180 Ringing	IMS_A forwards 180 Ringing response to AS/IM_A
29			→	→							180 Ringing	AS/IM_A returns, possibly modified, 180 Ringing response to IMS_A
30				→	→						180 Ringing	IMS_A forwards 180 Ringing response to IBCF_A
31					→	→					180 Ringing	IBCF_A forwards 180 Ringing response to IBCF_B
32						→	→				180 Ringing	IBCF_B forwards 180 Ringing response to IMS_B
33							→	→			180 Ringing	IMS_B forwards 180 Ringing response to AS/IM_B
34							←	←			180 Ringing	AS/IM_B returns, possibly modified, 180 Ringing response to IMS_B
35						←	←				180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
36					←	←					180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
37				←	←						180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
38				→					→		180 Ringing	IMS_A forwards 180 Ringing response to UE_B
39		→		→							MESSAGE	UE_A sends MESSAGE to IMS_A with delivery notification of initial message from user B
40			←	←							MESSAGE	IMS_A forwards MESSAGE to AS/IM_A
41			→	→							MESSAGE	AS/IM_A returns, possibly modified, MESSAGE to IMS_A
42				→	→						MESSAGE	IMS_A forwards MESSAGE to IBCF_A
43					→	→					MESSAGE	IBCF_A forwards MESSAGE to IBCF_B
44						→	→				MESSAGE	IBCF_B forwards MESSAGE to IMS_B
45							→	→			MESSAGE	IMS_B forwards MESSAGE to AS/IM_B
46							←	←			MESSAGE	AS/IM_B returns, possibly modified, MESSAGE to IMS_B
47						←	←				MESSAGE	IMS_B forwards MESSAGE to IBCF_B
48					←	←					MESSAGE	IBCF_B forwards MESSAGE to IBCF_A
49				←	←						MESSAGE	IBCF_A forwards MESSAGE to IMS_A



Step	Direction										Message	Comment
	User A	UE A	AS/IMA	IMSA	IBCFA	IBCFB	IMSB	AS/IMB	UE B	User B		
50											MESSAGE	IMS_A forwards MESSAGE to UE_B
51												User B is informed that initial message was delivered to user A
52											200 OK	UE_B responds MESSAGE with 200 OK response
53											200 OK	IMS_A forwards 200 OK response to IBCF_A
54											200 OK	IBCF_A forwards 200 OK response to IBCF_B
55											200 OK	IBCF_B forwards 200 OK response to IMS_B
56											200 OK	IMS_B forwards 200 OK response to AS/IM_B
57											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
58											200 OK	IMS_B forwards 200 OK response to IBCF_B
59											200 OK	IBCF_B forwards 200 OK response to IBCF_A
60											200 OK	IBCF_A forwards 200 OK response to IMS_A
61											200 OK	IMS_A forwards 200 OK response to AS/IM_A
62											200 OK	AS/IM_A returns, possibly modified, ACK to IMS_A
63											200 OK	IMS_A forwards ACK to UE_A (CheckMSRP2)
64												User A reads the initial message from user B and opens the 1-to-1 chat
65											200 OK	UE_A responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform B-side with specific data for MSRP connection set up
66											200 OK	IMS_A forwards 200 OK response to AS/IM_A
67											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
68											200 OK	IMS_A forwards 200 OK response to IBCF_A
69											200 OK	IBCF_A forwards 200 OK response to IBCF_B
70											200 OK	IBCF_B forwards 200 OK response to IMS_B
71											200 OK	IMS_B forwards 200 OK response to AS/IM_B
72											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
73											200 OK	IMS_B forwards 200 OK response to IBCF_B
74											200 OK	IBCF_B forwards 200 OK response to IBCF_A
75											200 OK	IBCF_A forwards 200 OK response to IMS_A
76											200 OK	IMS_A forwards 200 OK response to UE_B
77											ACK	UE_B acknowledges the receipt of 200 OK for INVITE
78											ACK	IMS_A forwards ACK to IBCF_A

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
79					→						ACK	IBCF_A forwards ACK to IBCF_B
80						→					ACK	IBCF_B forwards ACK to IMS_B
81							→				ACK	IMS_B forwards ACK to AS/IM_B
82							←				ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
83						←					ACK	IMS_B forwards ACK to IBCF_B
84					←						ACK	IBCF_B forwards ACK to IBCF_A
85				←							ACK	IBCF_A forwards ACK to IMS_A
86			←								ACK	IMS_A forwards ACK to AS/IM_A
87			→								ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
88		←									ACK	IMS_A forwards ACK to UE_A
89	←									→		Users perform chatting (see clause 5.3.1 Chat 1 to 1 via MSRP and use 5.4.1 test description) - CheckMSRP2
90A									←			User B closes the 1-to-1 chat
91A				←							BYE	UE_B releases the 1-to-1 chat session with BYE
92A				→							BYE	IMS_A forwards BYE to IBCF_A
93A					→						BYE	IBCF_A forwards BYE to IBCF_B
94A						→					BYE	IBCF_B forwards BYE to IMS_B
95A							→				BYE	IMS_B forwards BYE to AS/IM_B
96A							←				BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
97A						←					BYE	IMS_B forwards BYE to IBCF_B
98A					←						BYE	IBCF_B forwards BYE to IBCF_A
99A				←							BYE	IBCF_A forwards BYE to IMS_A
100A			←								BYE	IMS_A forwards BYE to AS/IM_A
101A			→								BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
102A		←									BYE	IMS_A forwards BYE to UE_A
103A		→									200 OK	UE_A sends 200 OK for BYE
104A			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
105A			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
106A				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
107A					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
108A						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
109A							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
110A							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
111A						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
112A					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
113A				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
114A				→				→			200 OK	IMS_A forwards 200 OK response to UE_B
115A									→			User B is informed that that 1-to-1 chat with user A is closed
90B	→											User A closes the 1-to-1 chat

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
91B											BYE	UE_A releases the 1-to-1 chat session with BYE
92B											BYE	IMS_A forwards BYE to AS/IM_A
93B											BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
94B											BYE	IMS_A forwards BYE to IBCF_A
95B											BYE	IBCF_A forwards BYE to IBCF_B
96B											BYE	IBCF_B forwards BYE to IMS_B
97B											BYE	IMS_B forwards BYE to AS/IM_B
98B											BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
99B											BYE	IMS_B forwards BYE to IBCF_B
100B											BYE	IBCF_B forwards BYE to IBCF_A
101B											BYE	IBCF_A forwards BYE to IMS_A
102B											BYE	IMS_A forwards BYE to UE_B
103B											200 OK	UE_B sends 200 OK for BYE
104B											200 OK	IMS_A forwards 200 OK response to IBCF_A
105B											200 OK	IBCF_A forwards 200 OK response to IBCF_B
106B											200 OK	IBCF_B forwards 200 OK response to IMS_B
107B											200 OK	IMS_B forwards 200 OK response to AS/IM_B
108B											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
109B											200 OK	IMS_B forwards 200 OK response to IBCF_B
110B											200 OK	IBCF_B forwards 200 OK response to IBCF_A
111B											200 OK	IBCF_A forwards 200 OK response to IMS_A
112B											200 OK	IMS_A forwards 200 OK response to AS/IM_A
113B											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
114B											200 OK	IMS_A forwards 200 OK response to UE_A
115B												User A is informed that that 1-to-1 chat with user B is closed

4.5.3.2 Several messages prior to establishment of 1-to-1 chat

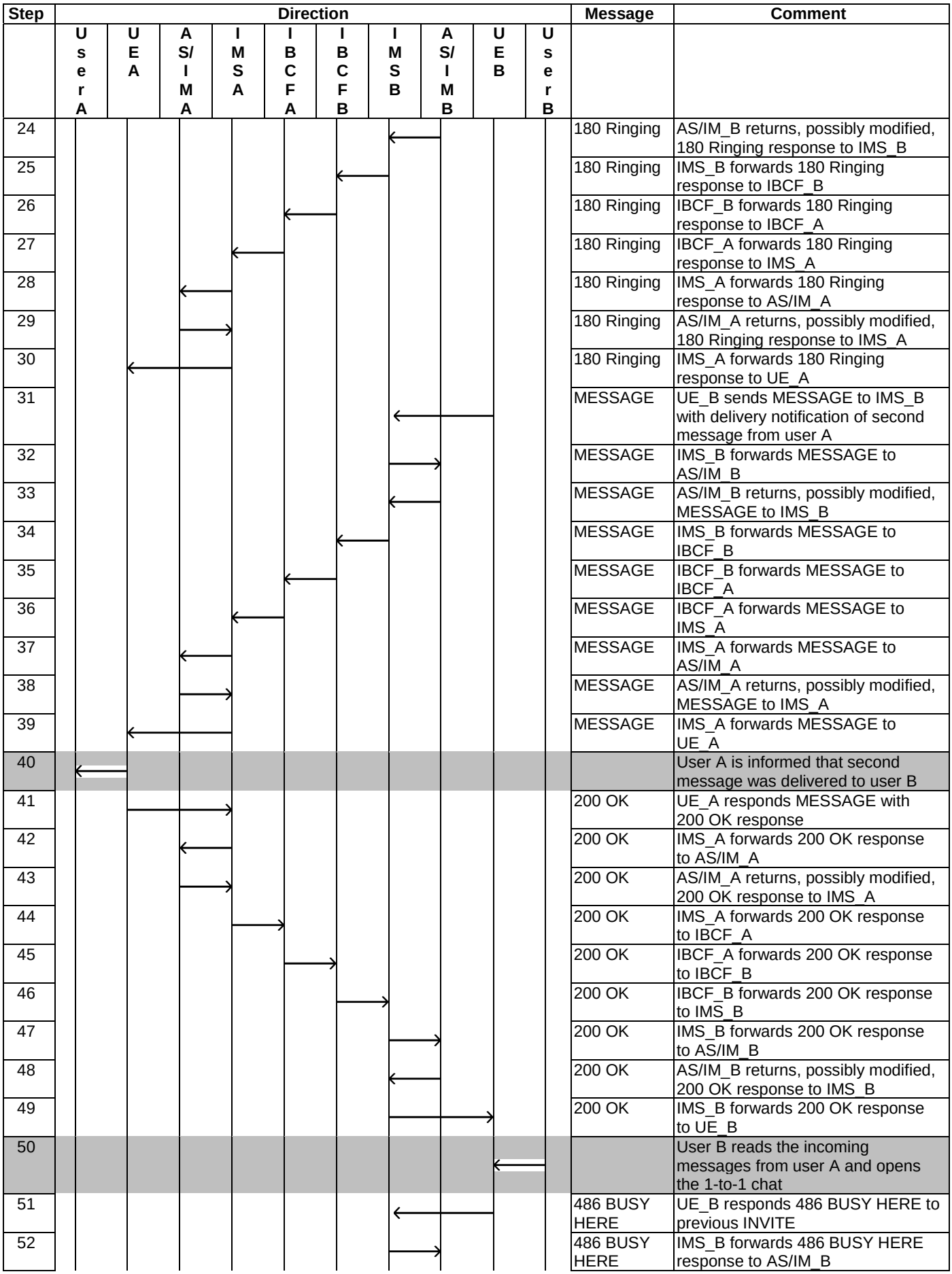
4.5.3.2.1 Several messages prior to establishment of 1-to-1 chat - interworking

Interoperability Test Description		
Identifier:	TD_IMS_CHAT_0003	
Summary:	IMS network supports 1-to-1 IM/Chat service and messages exchange between two users in their home network can be performed. User B waits until receiving several messages from User A before accepting the chat invitation	
Configuration:	CF_INT_AS	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5097_01	TS 124 229 [1], clause 5.4.3.2 ¶11 (1st numbered list)

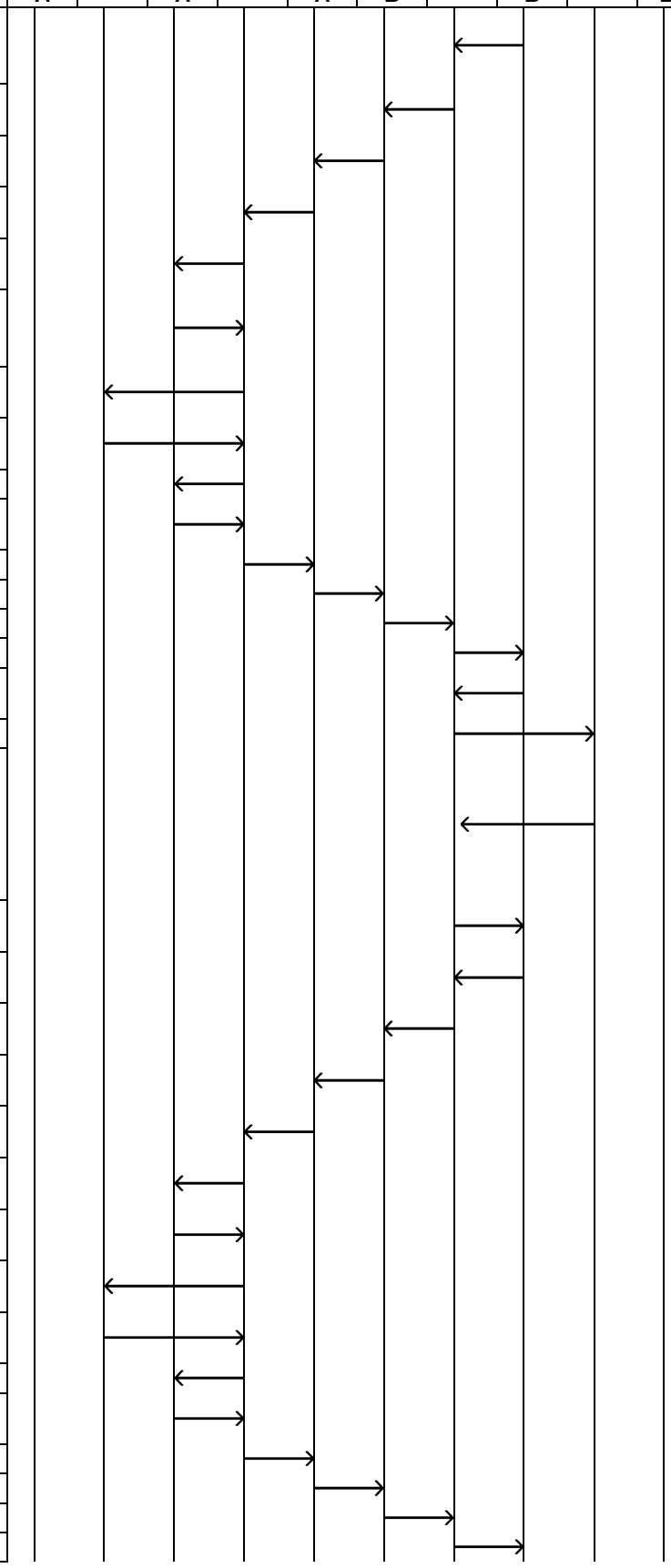
Interoperability Test Description		
	TP_IMS_5108_03	TS 124 229 [1], clause 5.4.3.3 ¶5 (item 4 in 1st numbered list)
	TP_IMS_5115_08	TS 124 229 [1], clause 5.4.3.3 ¶89 (4th numbered list)
	TD_MSRP_CHAT_0001	RFC 4975 [8], clauses 5.4, 7.1 and 7.2
Use Case ref.:	UC_RCS_4_I & UC_MSRP_01	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A and UE_B shall support MSRP • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User A selects User B in the phone address book and sends him an initial message with MSRP indication
	2	User B is informed of incoming message
	3	User A is informed that initial message was delivered to user B
	4	User A sends to User B a second message
	5	User B is informed of incoming two messages
	6	User A is informed that second message was delivered to user B
	7	User B reads the incoming messages from user A and opens the 1-to-1 chat
	8	Users perform chatting (MSRP session)
	9A	User A closes the 1-to-1 chat
	9B	User B closes the 1-to-1 chat
	10A	User A is informed that 1-to-1 chat with user B is closed
	10B	User B is informed that 1-to-1 chat with user A is closed
Conformance Criteria:	**Check**	
	1	TP_IMS_5097_01 in CFW step 10 (INVITE): *ensure that {* *when { UE_A sends an initial INVITE to UE_B }* *then { IMS_B receives the initial INVITE* *not containing a Route_header* *indicating the S-CSCF_SIP_URI of IMS_A* *containing a P-Charging-Vector_header* *(containing an icid-value_parameter and* *containing a orig-ioi_parameter indicating IMS_A and* *not containing an access-network-charging-info_parameter and* *not containing a term-ioi_parameter) and* *containing a Record-Route_header* *indicating the originating S-CSCF_SIP_URI }* *}*
	2	TP_IMS_5108_03 in CFW step 14 (INVITE) *ensure that {* *when { IUT receives an initial INVITE from IMS_A addressed_to UE_B}* *then { IUT sends the INVITE to AS_B* *containing a topmost Route_header* *indicating the SIP_URI of AS_B and* *containing a Route_header* *indicating the S-CSCF_SIP_URI of IUT_* *containing a P-Charging-Vector_header* *(containing an orig-ioi_parameter* *indicating IMS_A and* *not containing a term-ioi_parameter) }* *}*

Interoperability Test Description		
	3	TP_IMS_5115_08 in CFW step 35 (200 OK) *ensure that {* *when { IMS_B receives 200_response from AS_B addressed to UE_A }* *then { IMS_B sends the 200_response to IMS_A* *containing a P-Charging-Vector_header* *including a orig-ioi_parameter* *indicating operator_identifier of IMS_A and* *including a term-ioi_parameter* *indicating operator_identifier of IMS_B }* *}*

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
1												Follow UC_RCS_4_I (1-48)
2	→											User A sends to User B a second message
3		→	→								INVITE	UE_A sends second INVITE to IMS_A with user A second message in the Subject header, CPIM/IMND headers and the first SDP offer indicating all specific data for MSRP connection set up
4		←		←							100 Trying	IMS_A responds with a 100 Trying provisional response
5			←								INVITE	IMS_A forwards INVITE to AS/IM_A
6			→								100 Trying	AS/IM_A responds with a 100 Trying provisional response
7			→								INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
8			←								100 Trying	IMS_A responds with a 100 Trying provisional response
9				→							INVITE	IMS_A forwards INVITE to IBCF_A
10				←							100 Trying	IBCF_A responds with a 100 Trying provisional response
11					→						INVITE	IBCF_A forwards INVITE to IBCF_B
12					←						100 Trying	IBCF_B responds with a 100 Trying provisional response
13						→					INVITE	IBCF_B forwards INVITE to IMS_B
14						←					100 Trying	IMS_B responds with a 100 Trying provisional response
15							→				INVITE	IMS_B forwards INVITE to AS/IM_B
16							←				100 Trying	AS/IM_B responds with a 100 Trying provisional response
17							←				INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
18							→				100 Trying	IMS_B responds with a 100 Trying provisional response
19							→		→		INVITE	IMS_B forwards INVITE to UE_B
20							←		←		100 Trying	UE_B optionally responds with a 100 Trying provisional response
21									→			User B is informed of incoming two messages
22							←		←		180 Ringing	UE_B responds to additional INVITE with 180 Ringing to indicate that invitation to an enhanced messaging session has reached the invited user
23							→				180 Ringing	IMS_B forwards 180 Ringing response to AS/IM_B



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
24							←				180 Ringing	AS/IM_B returns, possibly modified, 180 Ringing response to IMS_B
25						←					180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
26					←						180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
27				←							180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
28			←								180 Ringing	IMS_A forwards 180 Ringing response to AS/IM_A
29			→								180 Ringing	AS/IM_A returns, possibly modified, 180 Ringing response to IMS_A
30		←									180 Ringing	IMS_A forwards 180 Ringing response to UE_A
31								←			MESSAGE	UE_B sends MESSAGE to IMS_B with delivery notification of second message from user A
32							→				MESSAGE	IMS_B forwards MESSAGE to AS/IM_B
33								←			MESSAGE	AS/IM_B returns, possibly modified, MESSAGE to IMS_B
34						←					MESSAGE	IMS_B forwards MESSAGE to IBCF_B
35					←						MESSAGE	IBCF_B forwards MESSAGE to IBCF_A
36				←							MESSAGE	IBCF_A forwards MESSAGE to IMS_A
37			←								MESSAGE	IMS_A forwards MESSAGE to AS/IM_A
38			→								MESSAGE	AS/IM_A returns, possibly modified, MESSAGE to IMS_A
39		←									MESSAGE	IMS_A forwards MESSAGE to UE_A
40	←											User A is informed that second message was delivered to user B
41		→		→							200 OK	UE_A responds MESSAGE with 200 OK response
42			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
43			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
44				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
45					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
46						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
47							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
48								←			200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
49								→			200 OK	IMS_B forwards 200 OK response to UE_B
50									←			User B reads the incoming messages from user A and opens the 1-to-1 chat
51								←			486 BUSY HERE	UE_B responds 486 BUSY HERE to previous INVITE
52							→				486 BUSY HERE	IMS_B forwards 486 BUSY HERE response to AS/IM_B



Step	Message	Comment
53	486 BUSY HERE	AS/IM_B returns, possibly modified, 486 BUSY HERE response to IMS_B
54	486 BUSY HERE	IMS_B forwards 486 BUSY HERE response to IBCF_B
55	486 BUSY HERE	IBCF_B forwards 486 BUSY HERE response to IBCF_A
56	486 BUSY HERE	IBCF_A forwards 486 BUSY HERE response to IMS_A
57	486 BUSY HERE	IMS_A forwards 486 BUSY HERE response to AS/IM_A
58	486 BUSY HERE	AS/IM_A returns, possibly modified, 486 BUSY HERE response to IMS_A
59	486 BUSY HERE	IMS_A forwards 486 BUSY HERE response to UE_A
60	ACK	UE_A acknowledges the receipt of 486 BUSY HERE for INVITE
61	ACK	IMS_A forwards ACK to AS/IM_A
62	ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
63	ACK	IMS_A forwards ACK to IBCF_A
64	ACK	IBCF_A forwards ACK to IBCF_B
65	ACK	IBCF_B forwards ACK to IMS_B
66	ACK	IMS_B forwards ACK to AS/IM_B
67	ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
68	ACK	IMS_B forwards ACK to UE_B
69	200 OK	UE_B responds initial INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform A-side with specific data for MSRP connection set up
70	200 OK	IMS_B forwards 200 OK response to AS/IM_B
71	200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
72	200 OK	IMS_B forwards 200 OK response to IBCF_B
73	200 OK	IBCF_B forwards 200 OK response to IBCF_A
74	200 OK	IBCF_A forwards 200 OK response to IMS_A
75	200 OK	IMS_A forwards 200 OK response to AS/IM_A
76	200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
77	200 OK	IMS_A forwards 200 OK response to UE_A
78	ACK	UE_A acknowledges the receipt of 200 OK for the initial INVITE
79	ACK	IMS_A forwards ACK to AS/IM_A
80	ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
81	ACK	IMS_A forwards ACK to IBCF_A
82	ACK	IBCF_A forwards ACK to IBCF_B
83	ACK	IBCF_B forwards ACK to IMS_B
84	ACK	IMS_B forwards ACK to AS/IM_B

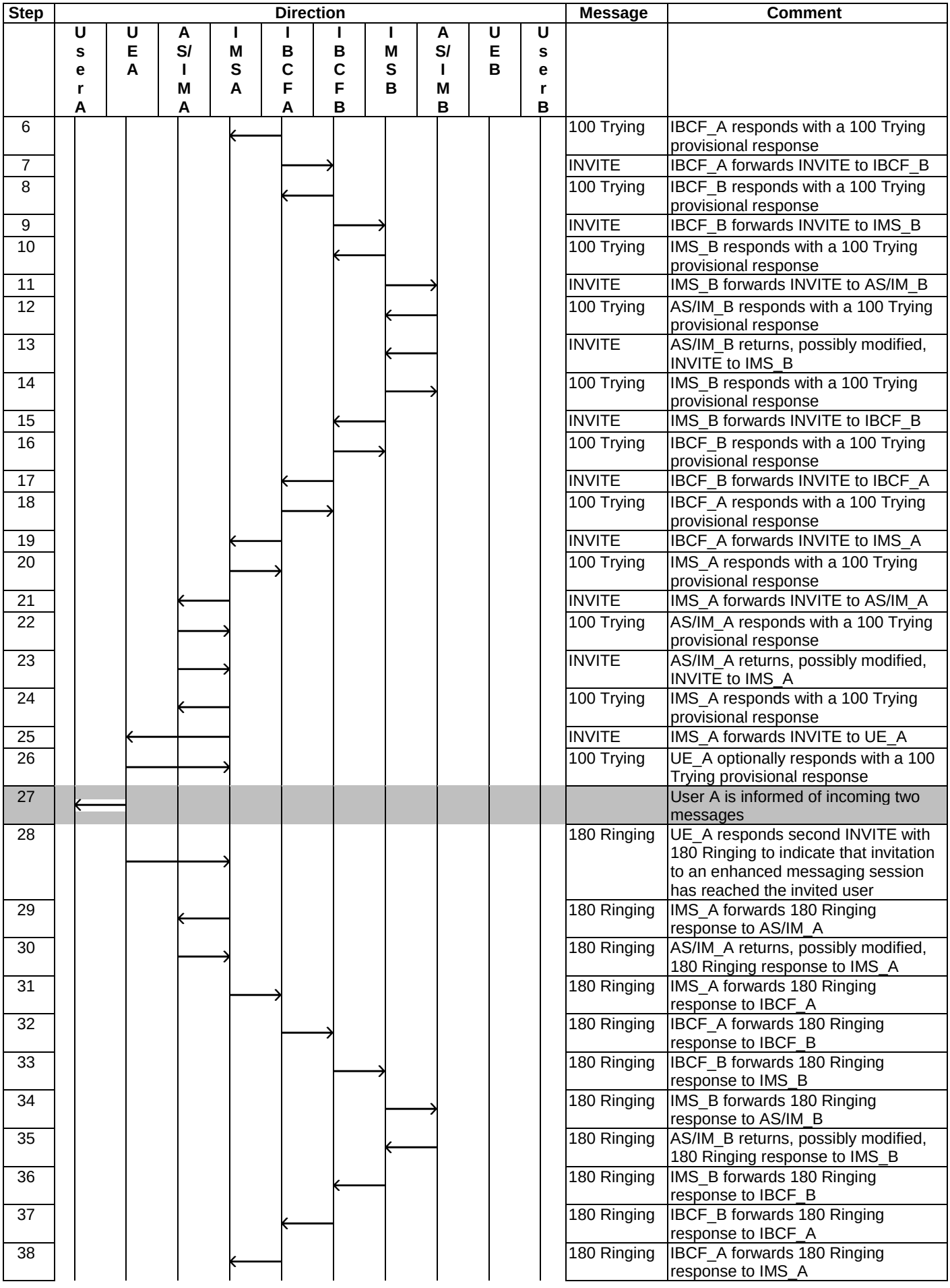
Step	Direction										Message	Comment
	User A	UEA	AS/IMA	IMSA	IBCFA	IBCFB	IMSB	AS/IMB	UEB	User B		
85							←				ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
86							→	→			ACK	IMS_B forwards ACK to UE_B
87	←									→		Users perform chatting (see clause 5.3.1 Chat 1 to 1 via MSRP CheckMSRP3)
88												Continue UC_RCS_4_I (69A-88B)

4.5.3.2.2 Several messages prior to establishment of 1-to-1 chat - roaming (optional)

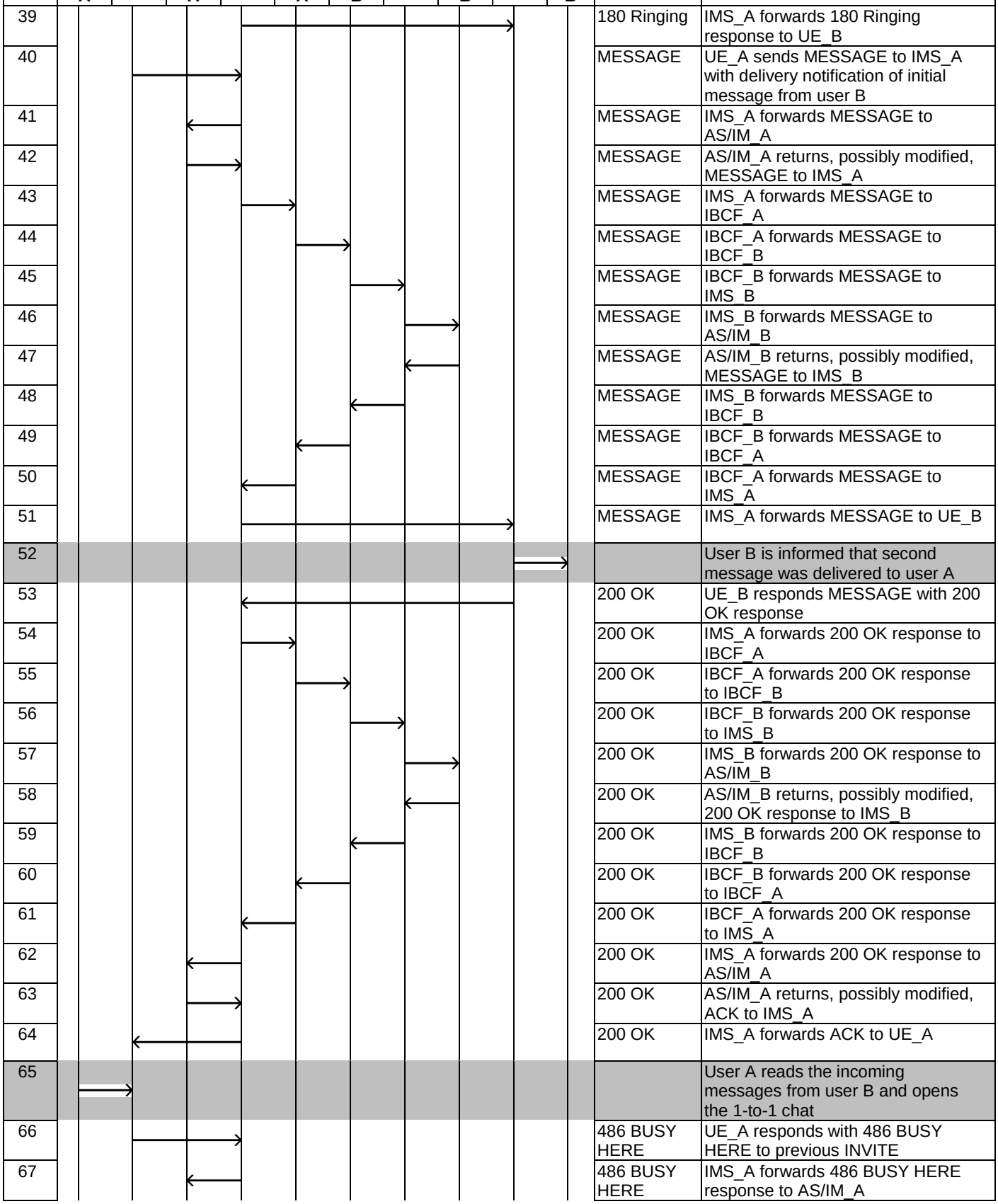
Interoperability Test Description		
Identifier:	TD_IMS_CHAT_0004	
Summary:	IMS network supports 1-to-1 IM/Chat service and messages exchange between two users, one user in its home network and one user roaming can be performed. User B waits until receiving several messages from User A before accepting the chat invitation	
Configuration:	CF_ROAM_AS (OPTIONAL)	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5046_01	TS 124 229 [1], clause 5.2.6.3.3 ¶1 (1st numbered list)
	TP_IMS_5067_01	TS 124 229 [1], clause 5.2.7.2 ¶5
	TP_IMS_5097_09	TS 124 229 [1], clause 5.4.3.2 ¶11 (items 5 and 8 in 1st numbered list)
Use Case ref.:	UC_RCS_4_R	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B via IMS_A optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User B selects User A in the phone address book and sends him an initial message with MSRP indication
	2	User A is informed of incoming message
	3	User B is informed that initial message was delivered to user A
	4	User B sends to User A a second message
	5	User A is informed of incoming two messages
	6	User B is informed that second message was delivered to user A
	7	User A reads the incoming messages from user B and opens the 1-to-1 chat
	8	Users perform chatting (MSRP session)
	9A	User B closes the 1-to-1 chat
	9B	User A closes the 1-to-1 chat
	10A	User B is informed that 1-to-1 chat with user A is closed
	10B	User A is informed that 1-to-1 chat with user B is closed

Interoperability Test Description		
Conformance Criteria:	**Check**	
	1	TP_IMS_5046_01 in CFW step 6 (INVITE) *ensure that {* *when { IMS_A receives an initial INVITE from UE_B }* *then { IMS_A sends the INVITE to IMS_B* *containing a Route_header* *not indicating the P-CSCF_SIP_URI of IMS_A and* *containing a Route_header* *indicating the "list of Service Route header URIs* *from the registration" and* *containing an additional Via_header* *containing (the P-CSCF_via_port_number and* *(the P-CSCF-FQDN_address or* *the P-CSCF-IP_address)) of IMS_A and* *containing an additional topmost Record-Route_header* *indicating (the P-CSCF_port_number* *'where it awaits subsequent requests' from UE_A and* *(the P-CSCF-FQDN_address or* *the P-CSCF-IP_address)) of IMS_A and* *not containing P-Preferred-Identity_header and* *containing a P-Asserted-Identity_header* *containing an address of UE_B and* *containing a P-Charging-Vector_header* *containing an icid-value_parameter }* *}*
	2	TP_IMS_5067_01 in CFW step 6 (INVITE) *ensure that {* *when { IMS_A receives an initial INVITE from UE_B }* *then { IMS_A sends the INVITE to IMS_B* *containing a P-Charging-Vector_header* *}* *}*
	3	TP_IMS_5097_09 in CFW step 10 (INVITE) *ensure that {* *when { IUT receives an initial INVITE from IMS_A addressed_to UE_A }* *then { IUT sends the initial INVITE to AS_B* *containing a Route_header* *indicating the SIP_URI of AS_B and* *containing a P-Charging-Function-Addresses_header and* *containing a P-Charging-Vector_header* *(containing an orig-ioi_parameter* *indicating IMS_A and* *not containing a term-ioi_parameter and* *containing an access-network-charging-info_parameter) }* *}*

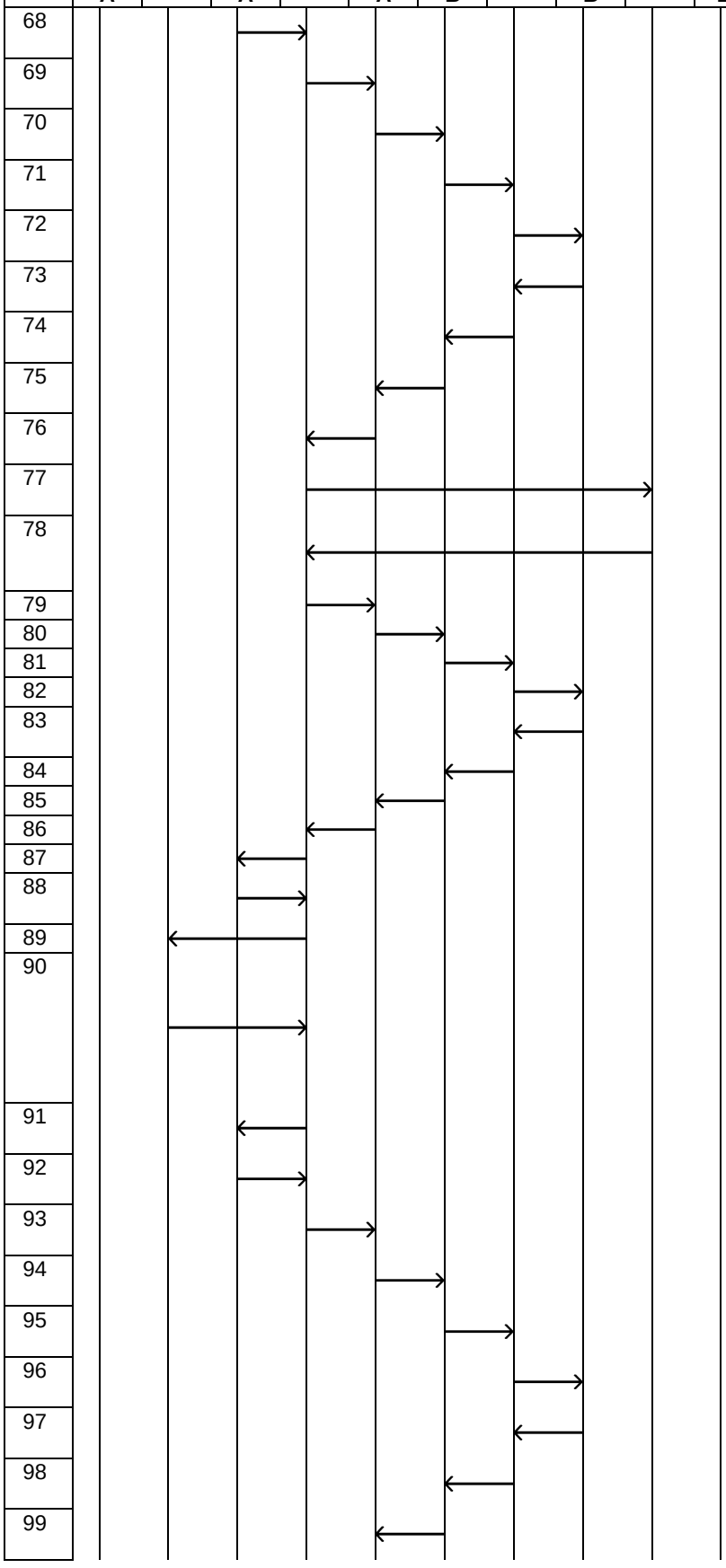
Step	Direction										Message	Comment
	User A	UEA	AS/IMA	IMSA	IBCFA	IBCFB	IMSB	AS/IMB	UEB	User B		
1												Follow UC_RCS_4_R (1-63)
2									←			User B sends to User A a second message
3				←							INVITE	UE_B sends second INVITE to IMS_A with user A second message in the Subject header, CPIM/IMND headers and the first SDP offer indicating all specific data for MSRP connection set up
4									→		100 Trying	IMS_A responds with a 100 Trying provisional response
5				→							INVITE	IMS_A forwards INVITE to IBCF_A



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
6				←							100 Trying	IBCF_A responds with a 100 Trying provisional response
7					→						INVITE	IBCF_A forwards INVITE to IBCF_B
8					←						100 Trying	IBCF_B responds with a 100 Trying provisional response
9						→					INVITE	IBCF_B forwards INVITE to IMS_B
10						←					100 Trying	IMS_B responds with a 100 Trying provisional response
11							→				INVITE	IMS_B forwards INVITE to AS/IM_B
12							←				100 Trying	AS/IM_B responds with a 100 Trying provisional response
13							←				INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
14								→			100 Trying	IMS_B responds with a 100 Trying provisional response
15						←					INVITE	IMS_B forwards INVITE to IBCF_B
16						→					100 Trying	IBCF_B responds with a 100 Trying provisional response
17					←						INVITE	IBCF_B forwards INVITE to IBCF_A
18					→						100 Trying	IBCF_A responds with a 100 Trying provisional response
19				←							INVITE	IBCF_A forwards INVITE to IMS_A
20				→							100 Trying	IMS_A responds with a 100 Trying provisional response
21			←								INVITE	IMS_A forwards INVITE to AS/IM_A
22			→								100 Trying	AS/IM_A responds with a 100 Trying provisional response
23			→								INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
24			←								100 Trying	IMS_A responds with a 100 Trying provisional response
25		←									INVITE	IMS_A forwards INVITE to UE_A
26		→									100 Trying	UE_A optionally responds with a 100 Trying provisional response
27	←											User A is informed of incoming two messages
28		→									180 Ringing	UE_A responds second INVITE with 180 Ringing to indicate that invitation to an enhanced messaging session has reached the invited user
29			←								180 Ringing	IMS_A forwards 180 Ringing response to AS/IM_A
30			→								180 Ringing	AS/IM_A returns, possibly modified, 180 Ringing response to IMS_A
31				→							180 Ringing	IMS_A forwards 180 Ringing response to IBCF_A
32					→						180 Ringing	IBCF_A forwards 180 Ringing response to IBCF_B
33						→					180 Ringing	IBCF_B forwards 180 Ringing response to IMS_B
34							→				180 Ringing	IMS_B forwards 180 Ringing response to AS/IM_B
35							←				180 Ringing	AS/IM_B returns, possibly modified, 180 Ringing response to IMS_B
36						←					180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
37					←						180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
38				←							180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
39											180 Ringing	IMS_A forwards 180 Ringing response to UE_B
40											MESSAGE	UE_A sends MESSAGE to IMS_A with delivery notification of initial message from user B
41											MESSAGE	IMS_A forwards MESSAGE to AS/IM_A
42											MESSAGE	AS/IM_A returns, possibly modified, MESSAGE to IMS_A
43											MESSAGE	IMS_A forwards MESSAGE to IBCF_A
44											MESSAGE	IBCF_A forwards MESSAGE to IBCF_B
45											MESSAGE	IBCF_B forwards MESSAGE to IMS_B
46											MESSAGE	IMS_B forwards MESSAGE to AS/IM_B
47											MESSAGE	AS/IM_B returns, possibly modified, MESSAGE to IMS_B
48											MESSAGE	IMS_B forwards MESSAGE to IBCF_B
49											MESSAGE	IBCF_B forwards MESSAGE to IBCF_A
50											MESSAGE	IBCF_A forwards MESSAGE to IMS_A
51											MESSAGE	IMS_A forwards MESSAGE to UE_B
52												User B is informed that second message was delivered to user A
53											200 OK	UE_B responds MESSAGE with 200 OK response
54											200 OK	IMS_A forwards 200 OK response to IBCF_A
55											200 OK	IBCF_A forwards 200 OK response to IBCF_B
56											200 OK	IBCF_B forwards 200 OK response to IMS_B
57											200 OK	IMS_B forwards 200 OK response to AS/IM_B
58											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
59											200 OK	IMS_B forwards 200 OK response to IBCF_B
60											200 OK	IBCF_B forwards 200 OK response to IBCF_A
61											200 OK	IBCF_A forwards 200 OK response to IMS_A
62											200 OK	IMS_A forwards 200 OK response to AS/IM_A
63											200 OK	AS/IM_A returns, possibly modified, ACK to IMS_A
64											200 OK	IMS_A forwards ACK to UE_A
65												User A reads the incoming messages from user B and opens the 1-to-1 chat
66											486 BUSY HERE	UE_A responds with 486 BUSY HERE to previous INVITE
67											486 BUSY HERE	IMS_A forwards 486 BUSY HERE response to AS/IM_A



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
68											486 BUSY HERE	AS/IM_A returns, possibly modified, 486 BUSY HERE response to IMS_A
69											486 BUSY HERE	IMS_A forwards 486 BUSY HERE response to IBCF_A
70											486 BUSY HERE	IBCF_A forwards 486 BUSY HERE response to IBCF_B
71											486 BUSY HERE	IBCF_B forwards 486 BUSY HERE response to IMS_B
72											486 BUSY HERE	IMS_B forwards 486 BUSY HERE response to AS/IM_B
73											486 BUSY HERE	AS/IM_B returns, possibly modified, 486 BUSY HERE response to IMS_B
74											486 BUSY HERE	IMS_B forwards 486 BUSY HERE response to IBCF_B
75											486 BUSY HERE	IBCF_B forwards 486 BUSY HERE response to IBCF_A
76											486 BUSY HERE	IBCF_A forwards 486 BUSY HERE response to IMS_A
77											486 BUSY HERE	IMS_A forwards 486 BUSY HERE response to UE_B
78											ACK	UE_B acknowledges the receipt of 486 BUSY HERE for the previous INVITE
79											ACK	IMS_A forwards ACK to IBCF_A
80											ACK	IBCF_A forwards ACK to IBCF_B
81											ACK	IBCF_B forwards ACK to IMS_B
82											ACK	IMS_B forwards ACK to AS/IM_B
83											ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
84											ACK	IMS_B forwards ACK to IBCF_B
85											ACK	IBCF_B forwards ACK to IBCF_A
86											ACK	IBCF_A forwards ACK to IMS_A
87											ACK	IMS_A forwards ACK to AS/IM_A
88											ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
89											ACK	IMS_A forwards ACK to UE_A
90											200 OK	UE_A responds initial INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform B-side with specific data for MSRP connection set up
91											200 OK	IMS_A forwards 200 OK response to AS/IM_A
92											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
93											200 OK	IMS_A forwards 200 OK response to IBCF_A
94											200 OK	IBCF_A forwards 200 OK response to IBCF_B
95											200 OK	IBCF_B forwards 200 OK response to IMS_B
96											200 OK	IMS_B forwards 200 OK response to AS/IM_B
97											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
98											200 OK	IMS_B forwards 200 OK response to IBCF_B
99											200 OK	IBCF_B forwards 200 OK response to IBCF_A

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
100				←	←						200 OK	IBCF_A forwards 200 OK response to IMS_A
101				→	→	→	→	→	→		200 OK	IMS_A forwards 200 OK response to UE_B
102				←	←	←	←	←	←		ACK	UE_B acknowledges the receipt of 200 OK for initial INVITE
103				→	→						ACK	IMS_A forwards ACK to IBCF_A
104					→	→					ACK	IBCF_A forwards ACK to IBCF_B
105						→	→				ACK	IBCF_B forwards ACK to IMS_B
106							→	→			ACK	IMS_B forwards ACK to AS/IM_B
107							←	←			ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
108						←	←				ACK	IMS_B forwards ACK to IBCF_B
109					←	←					ACK	IBCF_B forwards ACK to IBCF_A
110				←	←						ACK	IBCF_A forwards ACK to IMS_A
111			←	←							ACK	IMS_A forwards ACK to AS/IM_A
112			→	→							ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
113		←	←								ACK	IMS_A forwards ACK to UE_A
114	←	←	←	←	←	←	←	←	←	←		Users perform chatting (see clause 5.3.1 Chat 1 to 1 via MSRP)
115												Continue UC_RCS_4_R (90A-115B)

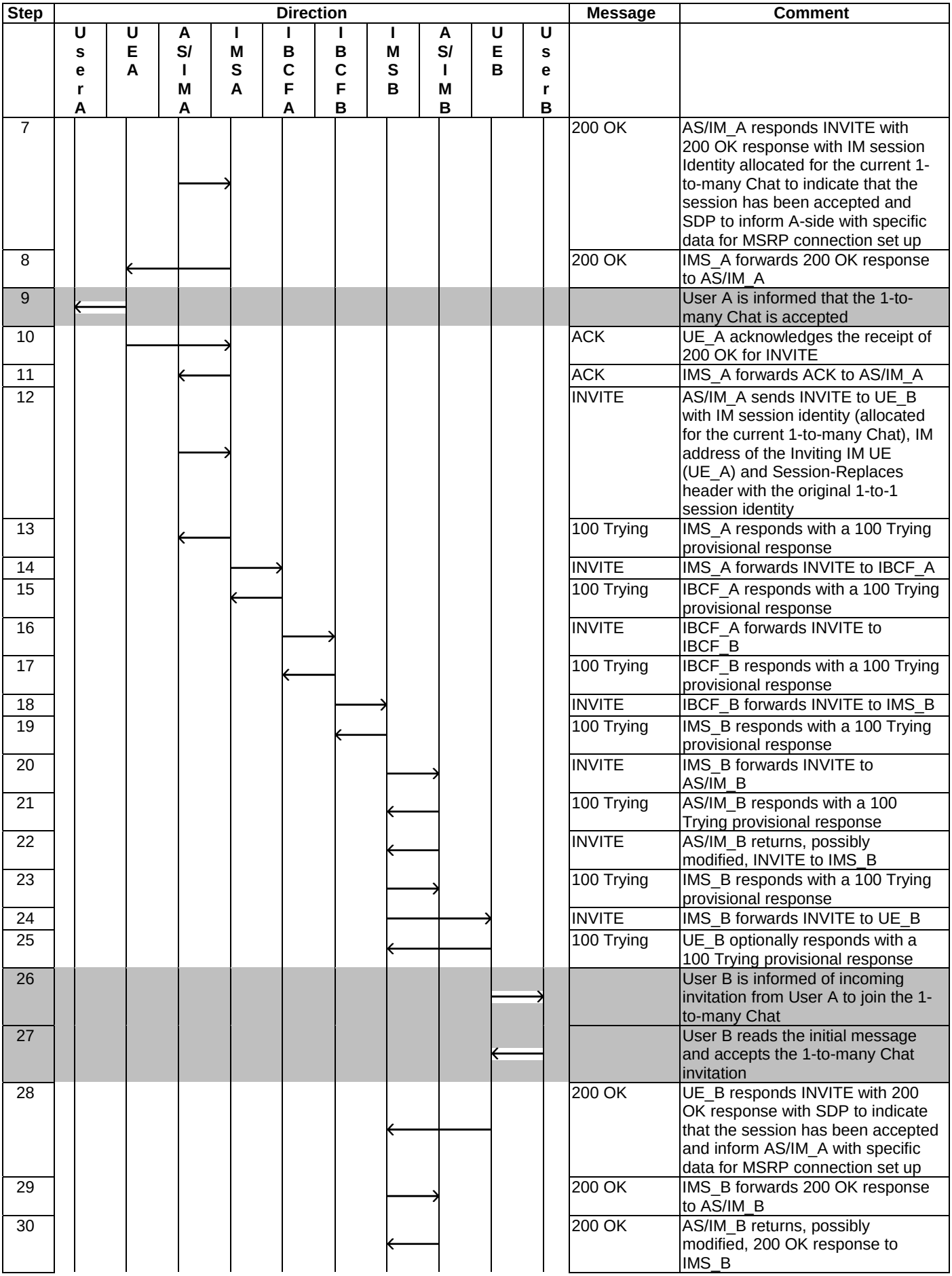
4.5.3.3 Switching to 1-to-many chat

4.5.3.3.1 Switching to 1-to-many chat - interworking

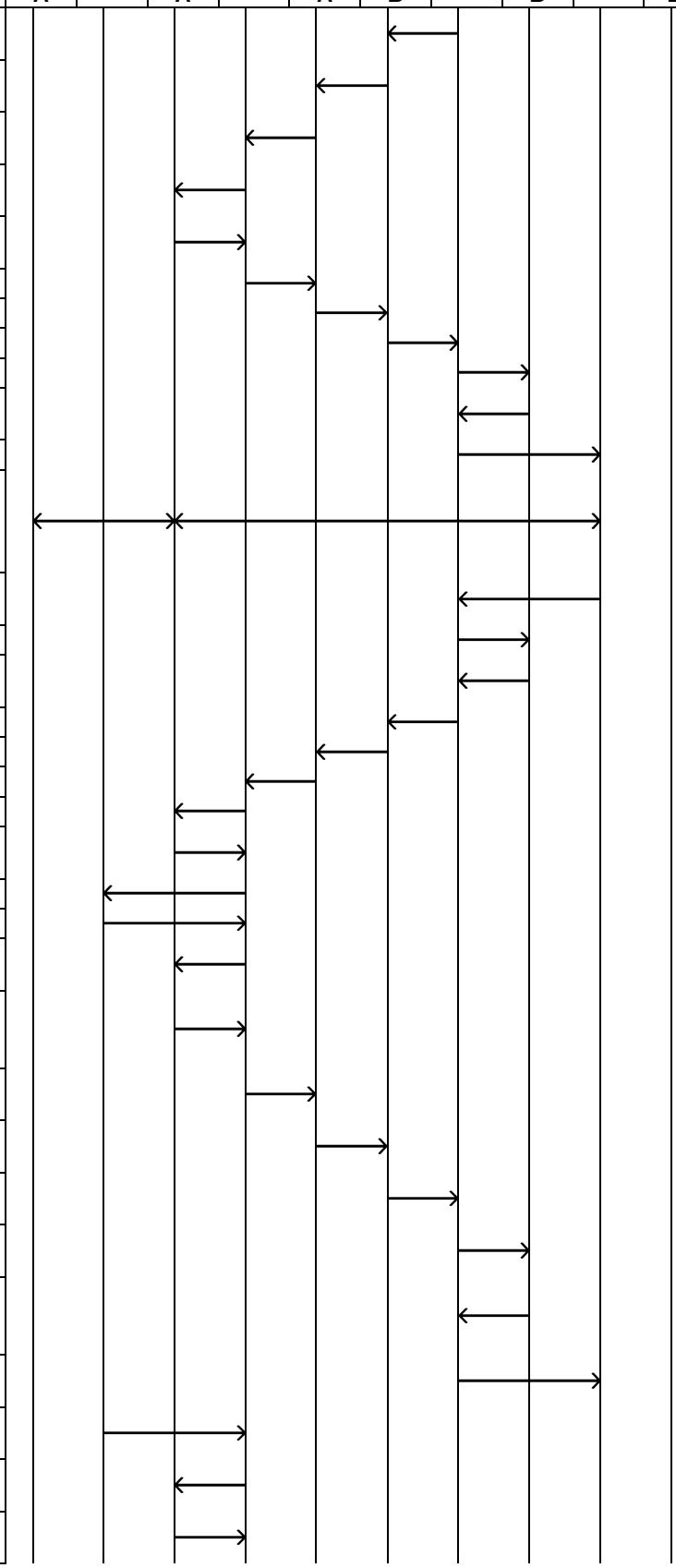
Interoperability Test Description		
Identifier:	TD_IMS_CHAT_0007	
Summary:	IMS network supports 1-to-many IM/Chat service and messages exchange between two users in their home network can be performed. User A switching 1-to-1 chat to 1-to-many chat by inviting User C	
Configuration:	CF_INT_AS	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5107_01	TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 6th numbered list)
	TD_MSRP_CHAT_0002	RFC 4975 [8], clauses 5.4, 7.1 and 7.2
Use Case ref.:	UC_RCS_7_I & UC_MSRP_02	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A, UE_C and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B and UE_C are registered in IMS_B optionally using userPRES according to table 1 • UE_A, UE_B and UE_C shall support MSRP • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A, UE_C and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	

Interoperability Test Description		
Test Sequence:	**Step**	
	1	User A selects User B in the phone address book and sends him an initial message with MSRP indication
	2	User B is informed of incoming message
	3	User A is informed that initial message was delivered to user B
	4	User B reads the initial message from user A and opens the 1-to-1 chat
	5	Users perform 1-to-1 chatting
	6	User A initiates a 1-to-many Chat with User B and User C by sending initial message
	7	User A is informed that the 1-to-many Chat is established
	8	User B is informed of incoming invitation from User A to join the 1-to-many Chat
	9	User B reads the initial message and accepts the 1-to-many Chat invitation
	10	User A is notified with list of 1-to-many Chat participants
	11	User B is notified with list of 1-to-many Chat participants
	12	Users perform messaging in the 1-to-many Chat (MSRP session)
	13	User B leaves the 1-to-many Chat
	14	User B is informed that he has left the 1-to-many Chat
	15	User A is notified that User B has left the 1-to-many Chat
	16A	User A leaves the 1-to-many Chat
	16B	User C leaves the 1-to-many Chat
	17A	User A is informed that the 1-to-many Chat has ended
	17B	User B is informed that the 1-to-many Chat has ended
	17C	User C is informed that the 1-to-many Chat has ended
Conformance Criteria:	**Check**	
	1	TP_IMS_5107_01 in CFW step 46 (BYE): *ensure that {* *when { UE_B sends BYE to UE_A }* *then { IMS_A receives the BYE* *not containing Route_header* *indicating the S-CSCF_SIP_URI of IMS_A* *}* *}*

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
1												Follow UC_RCS_4_I (1-68)
2		→										User A initiates a 1-to-many Chat with User B and User C by sending initial message
3			→	→							INVITE	UE_A sends INVITE to IMS_A with Request-URI set to IM CONF-FCTY-URI (conference factory uri), MIME resource-list body including invited IM Users, the first SDP offer indicating all specific data for MSRP connection set up and the identity of User B with Session-Replaces header (CheckMSR1)
4			←	←							100 Trying	IMS_A responds with a 100 Trying provisional response
5				←							INVITE	IMS_A forwards INVITE to AS/IM_A
6				→							100 Trying	AS/IM_A responds with a 100 Trying provisional response



Step	Direction										Message	Comment
	User A	UE A	AS/IMA	IMSA	IBCFA	IBCFB	IMSB	AS/IMB	UE B	User B		
7											200 OK	AS/IM_A responds INVITE with 200 OK response with IM session Identity allocated for the current 1-to-many Chat to indicate that the session has been accepted and SDP to inform A-side with specific data for MSRP connection set up
8											200 OK	IMS_A forwards 200 OK response to AS/IM_A
9												User A is informed that the 1-to-many Chat is accepted
10											ACK	UE_A acknowledges the receipt of 200 OK for INVITE
11											ACK	IMS_A forwards ACK to AS/IM_A
12											INVITE	AS/IM_A sends INVITE to UE_B with IM session identity (allocated for the current 1-to-many Chat), IM address of the Inviting IM UE (UE_A) and Session-Replaces header with the original 1-to-1 session identity
13											100 Trying	IMS_A responds with a 100 Trying provisional response
14											INVITE	IMS_A forwards INVITE to IBCF_A
15											100 Trying	IBCF_A responds with a 100 Trying provisional response
16											INVITE	IBCF_A forwards INVITE to IBCF_B
17											100 Trying	IBCF_B responds with a 100 Trying provisional response
18											INVITE	IBCF_B forwards INVITE to IMS_B
19											100 Trying	IMS_B responds with a 100 Trying provisional response
20											INVITE	IMS_B forwards INVITE to AS/IM_B
21											100 Trying	AS/IM_B responds with a 100 Trying provisional response
22											INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
23											100 Trying	IMS_B responds with a 100 Trying provisional response
24											INVITE	IMS_B forwards INVITE to UE_B
25											100 Trying	UE_B optionally responds with a 100 Trying provisional response
26												User B is informed of incoming invitation from User A to join the 1-to-many Chat
27												User B reads the initial message and accepts the 1-to-many Chat invitation
28											200 OK	UE_B responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform AS/IM_A with specific data for MSRP connection set up
29											200 OK	IMS_B forwards 200 OK response to AS/IM_B
30											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B



Step	Message	Comment
31	200 OK	IMS_B forwards 200 OK response to IBCF_B
32	200 OK	IBCF_B forwards 200 OK response to IBCF_A
33	200 OK	IBCF_A forwards 200 OK response to IMS_A
34	200 OK	IMS_A forwards 200 OK response to AS/IM_A
35	ACK	AS/IM_A acknowledges the receipt of 200 OK for INVITE
36	ACK	IMS_A forwards ACK to IBCF_A
37	ACK	IBCF_A forwards ACK to IBCF_B
38	ACK	IBCF_B forwards ACK to IMS_B
39	ACK	IMS_B forwards ACK to AS/IM_B
40	ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
41	ACK	IMS_B forwards ACK to UE_B
42		Users perform messaging in the 1-to-many Chat (see clause 5.3.2.1 Chat 1 to many via MSRP - Interworking)
43	BYE	UE_B releases the 1-to-1 IM session with BYE
43A	BYE	IMS_B forwards BYE to AS/IM_B
44	BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
45	BYE	IMS_B forwards BYE to IBCF_B
46	BYE	IBCF_B forwards BYE to IBCF_A
47	BYE	IBCF_A forwards BYE to IMS_A
48	BYE	IMS_A forwards BYE to AS/IM_A
49	BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
50	BYE	IMS_A forwards BYE to UE_A
51	200 OK	UE_A sends 200 OK for BYE
52	200 OK	IMS_A forwards 200 OK response to AS/IM_A
53	200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
54	200 OK	IMS_A forwards 200 OK response to IBCF_A
55	200 OK	IBCF_A forwards 200 OK response to IBCF_B
56	200 OK	IBCF_B forwards 200 OK response to IMS_B
57	200 OK	IMS_B forwards 200 OK response to AS/IM_B
58	200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
59	200 OK	IMS_B forwards 200 OK response to UE_B
60	SUBSCRIBE	UE_A subscribes to the conference event package
61	SUBSCRIBE	IMS_A forwards SUBCRIBE to AS/IM_A
62	200 OK	AS/IM_A sends 200 OK for SUBSCRIBE

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
63		←									200 OK	IMS_A forwards 200 OK response to UE_A
64			→								NOTIFY	AS/IM_A sends NOTIFY to UE_A with list of 1-to-many Chat participants
65		←									NOTIFY	IMS_A forwards the NOTIFY to UE_A
66	←											User A is notified with list of 1-to-many Chat participants
67		→									200 OK	UE_A responds with 200 OK to IMS_A
68			←								200 OK	IMS_A forwards the 200 OK response to AS/IM_A
69							←				SUBSCRIBE	UE_B subscribes to the conference event package
70							→				SUBSCRIBE	IMS_B forwards SUBSCRIBE to AS/IM_B
71							←				SUBSCRIBE	AS/IM_B returns, possibly modified, SUBSCRIBE to IMS_B
72						←					SUBSCRIBE	IMS_B forwards SUBSCRIBE to IBCF_B
73					←						SUBSCRIBE	IBCF_B forwards SUBSCRIBE to IBCF_A
74				←							SUBSCRIBE	IBCF_A forwards SUBSCRIBE to IMS_A
75			←								SUBSCRIBE	IMS_A forwards SUBSCRIBE to AS/IM_A
76			→								200 OK	AS/IM_A sends 200 OK for SUBSCRIBE
77				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
78					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
79						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
80							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
81							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
82							→				200 OK	IMS_B forwards 200 OK response to UE_B
83			→								NOTIFY	AS/IM_A sends NOTIFY to UE_B with list of 1-to-many Chat participants
84				→							NOTIFY	IMS_A forwards BYE to IBCF_A
85					→						NOTIFY	IBCF_A forwards BYE to IBCF_B
86						→					NOTIFY	IBCF_B forwards BYE to IMS_B
87							→				NOTIFY	IMS_B forwards BYE to AS/IM_B
88							←				NOTIFY	AS/IM_B returns, possibly modified, BYE to IMS_B
89							→				NOTIFY	IMS_B forwards BYE to UE_B
90									→			User B is notified with list of 1-to-many Chat participants
91							←				200 OK	UE_B sends 200 OK for NOTIFY
92							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
93							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B

Step	Direction										Message	Comment
	User A	UEA	AS/IMA	IMSA	IBCFA	IBCFB	IMSB	AS/IMB	UEB	User B		
94						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
95					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
96				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
97			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
98	↔		↔							↔		Users perform messaging in the 1-to-many Chat (see clause 5.3.2.1 Chat 1 to many via MSRP - Interworking)
99												Continue UC_RCS_6_I *(80A-116B)*

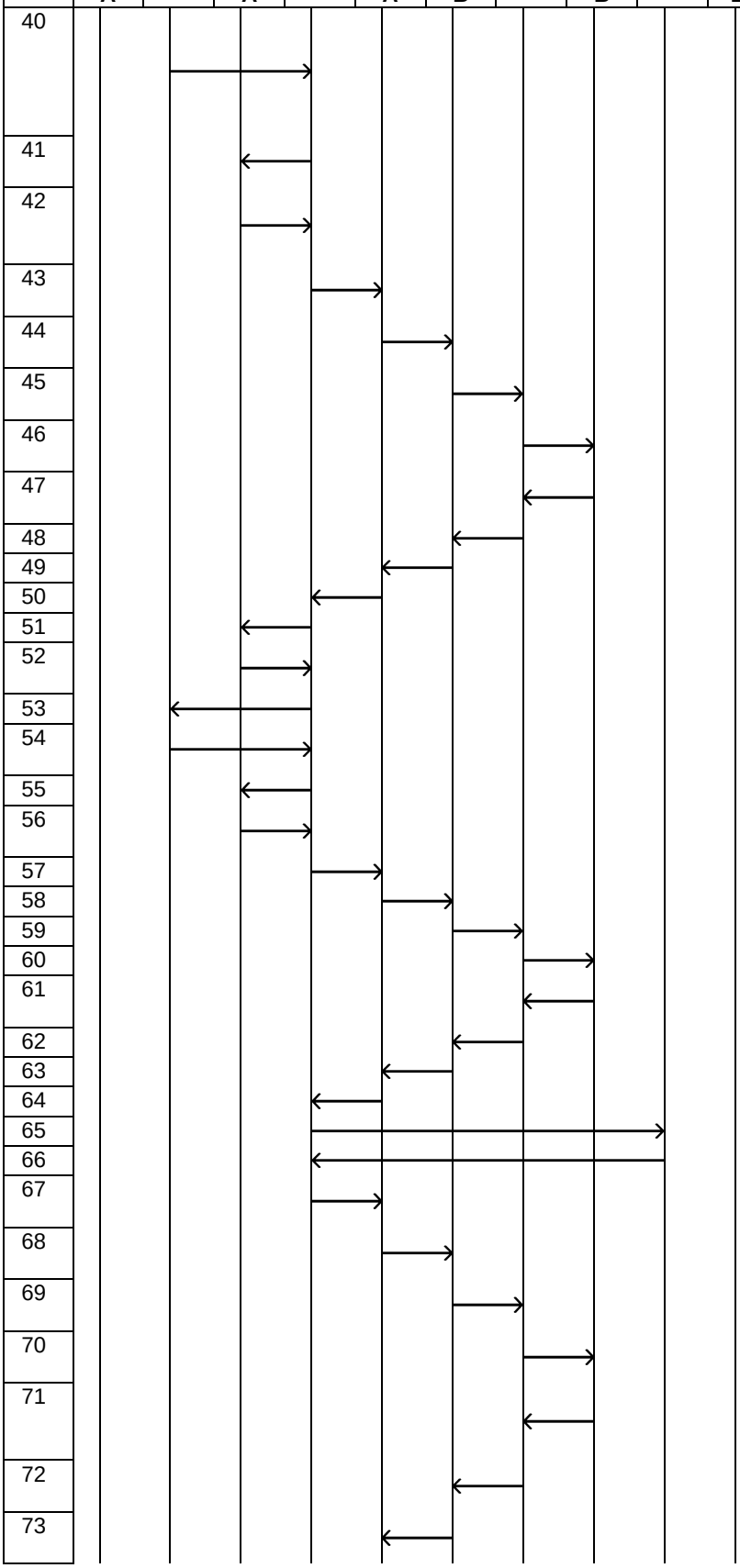
4.5.3.3.2 Switching to 1-to-many chat - roaming (optional)

Interoperability Test Description		
Identifier:	TD_IMS_CHAT_0008	
Summary:	IMS network supports 1-to-many IM/Chat service and messages exchange between two users, one user in its home network and one user roaming can be performed. User B switching 1-to-1 chat to 1-to-many chat by inviting User C	
Configuration:	CF_ROAM_AS (OPTIONAL)	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5052_01	TS 124 229 [1], clause 5.2.6.3-9 ¶1 (1st numbered list)
	TD_MSRP_CHAT_0002	RFC 4975 [8], clauses 5.4, 7.1 and 7.2
Use Case ref.:	UC_RCS_7_R & UC_MSRP_02_R	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A, UE_C and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B and UE_C are registered in IMS_B via IMS_A optionally using userPRES according to table 1 • UE_A, UE_B and UE_C shall support MSRP • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A, UE_C and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User B selects User A in the phone address book and sends him an initial message with MSRP indication
	2	User A is informed of incoming message
	3	User B is informed that initial message was delivered to user A
	4	User A reads the initial message from user B and opens the 1-to-1 chat
	5	Users perform 1-to-1 chatting (MSRP session)
	6	User B initiates a 1-to-many Chat with User A and User C by sending initial message
	7	User B is informed that the 1-to-many Chat is established
	8	User A is informed of incoming invitation from User B to join the 1-to-many Chat
	9	User A reads the initial message and accepts the 1-to-many Chat invitation
	10	User B is notified with list of 1-to-many Chat participants

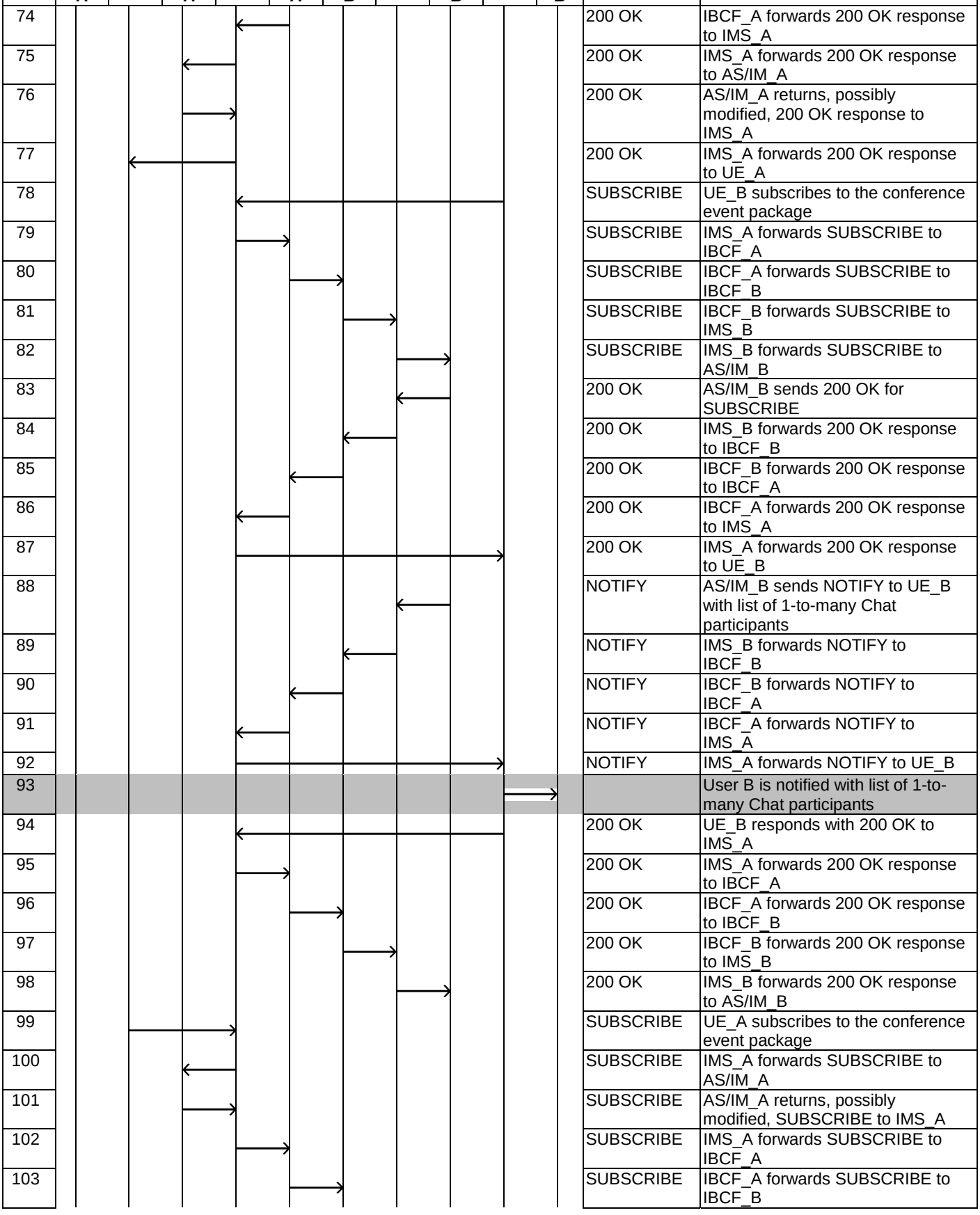
Interoperability Test Description		
	11	User A is notified with list of 1-to-many Chat participants
	12	Users perform messaging in the 1-to-many Chat (MSRP session)
	13A	User A leaves the 1-to-many Chat
	13B	User B leaves the 1-to-many Chat
	14A	User A is informed that he has left the 1-to-many Chat
	14B	User B is informed that he has left the 1-to-many Chat
	15A	User B is notified that all other users have left the 1-to-many Chat
	15B	User A is notified that all other users have left the 1-to-many Chat
	16A	User B leaves the 1-to-many Chat
	16B	User A leaves the 1-to-many Chat
	17A	User B is informed that the 1-to-many Chat has ended
	17B	User A is informed that the 1-to-many Chat has ended
Conformance Criteria:	**Check**	
	1	TP_IMS_5052_01 in CFW step 58 (BYE): *ensure that {* *when { IMS_B receives a BYE from UE_A }* *then { IMS_B sends the BYE to IMS_A* *not containing a Route_header* *indicating the P-CSCF_SIP_URI of IMS_A and* *containing the same Record-Route_header* *as in the previous ACK and* *containing a P-Charging-Vector header* *containing an icid-value_parameter* *}* *}*

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
1												Follow UC_RCS_4_R (1-89)
2									←			User B initiates a 1-to-many Chat with User A and User C by sending initial message
3				←							INVITE	UE_B sends INVITE to IMS_A with Request-URI set to IM CONF-FCTY-URI (conference factory uri), MIME resource-list body including invited IM Users, the first SDP offer indicating all specific data for MSRP connection set up and the identity of User A with Session-Replaces header
4				→							100 Trying	IMS_A responds with a 100 Trying provisional response
5				→							INVITE	IMS_A forwards INVITE to IBCF_A
6				←							100 Trying	IBCF_A responds with a 100 Trying provisional response
7					→						INVITE	IBCF_A forwards INVITE to IBCF_B
8					←						100 Trying	IBCF_B responds with a 100 Trying provisional response
9						→					INVITE	IBCF_B forwards INVITE to IMS_B
10						←					100 Trying	IMS_B responds with a 100 Trying provisional response
11							→				INVITE	IMS_B forwards INVITE to AS/IM_B
12							←				100 Trying	AS/IM_B responds with a 100 Trying provisional response

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
13							←				200 OK	AS/IM_B responds INVITE with 200 OK response with IM session Identity allocated for the current 1-to-many Chat to indicate that the session has been accepted and SDP to inform A-side with specific data for MSRP connection set up
14						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
15					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
16				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
17				→				→			200 OK	IMS_A forwards 200 OK response to UE_B
18									→			User B is informed that the 1-to-many Chat is established
19				←				←			ACK	UE_B acknowledges the receipt of 200 OK for INVITE
20				→							ACK	IMS_A forwards ACK to IBCF_A
21					→						ACK	IBCF_A forwards ACK to IBCF_B
22						→					ACK	IBCF_B forwards ACK to IMS_B
23							→				ACK	IMS_B forwards ACK to AS/IM_B
24							←				INVITE	AS/IM_B sends INVITE to UE_A with IM session identity (allocated for the current 1-to-many Chat), IM address of the Inviting IM UE (UE_B) and Session-Replaces header with the original 1-to-1 session identity
25							→				100 Trying	IMS_B responds with a 100 Trying provisional response
26						←					INVITE	IMS_B forwards INVITE to IBCF_B
27						→					100 Trying	IBCF_B responds with a 100 Trying provisional response
28					←						INVITE	IBCF_B forwards INVITE to IBCF_A
29					→						100 Trying	IBCF_A responds with a 100 Trying provisional response
30				←							INVITE	IBCF_A forwards INVITE to IMS_A
31				→							100 Trying	IMS_A responds with a 100 Trying provisional response
32			←								INVITE	IMS_A forwards INVITE to AS/IM_A
33			→								100 Trying	AS/IM_A responds with a 100 Trying provisional response
34			→								INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
35			←								100 Trying	IMS_A responds with a 100 Trying provisional response
36		←		←							INVITE	IMS_A forwards INVITE to UE_A
37		→		→							100 Trying	UE_A optionally responds with a 100 Trying provisional response
38	←											User A is informed of incoming invitation from user B to join the 1-to-many Chat
39	→											User A reads the initial message and accepts the 1-to-many Chat invitation



Step	Direction										Message	Comment
	User A	UE A	AS/IMA	IMSA	IBCFA	IBCFB	IMSB	AS/IMB	UE B	User B		
40											200 OK	UE_A responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform AS/IM_A with specific data for MSRP connection set up
41											200 OK	IMS_A forwards 200 OK response to AS/IM_A
42											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
43											200 OK	IMS_A forwards 200 OK response to IBCF_A
44											200 OK	IBCF_A forwards 200 OK response to IBCF_B
45											200 OK	IBCF_B forwards 200 OK response to IMS_B
46											200 OK	IMS_B forwards 200 OK response to AS/IM_B
47											ACK	AS/IM_B acknowledges the receipt of 200 OK for INVITE
48											ACK	IMS_B forwards ACK to IBCF_B
49											ACK	IBCF_B forwards ACK to IBCF_A
50											ACK	IBCF_A forwards ACK to IMS_A
51											ACK	IMS_A forwards ACK to AS/IM_A
52											ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
53											ACK	IMS_A forwards ACK to UE_A
54											BYE	UE_A releases the 1-to-1 IM session with BYE
55											BYE	IMS_A forwards BYE to AS/IM_A
56											BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
57											BYE	IMS_A forwards BYE to IBCF_A
58											BYE	IBCF_A forwards BYE to IBCF_B
59											BYE	IBCF_B forwards BYE to IMS_B
60											BYE	IMS_B forwards BYE to AS/IM_B
61											BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
62											BYE	IMS_B forwards BYE to IBCF_B
63											BYE	IBCF_B forwards BYE to IBCF_A
64											BYE	IBCF_A forwards BYE to IMS_A
65											BYE	IMS_A forwards BYE to UE_B
66											200 OK	UE_B sends 200 OK for BYE
67											200 OK	IMS_A forwards 200 OK response to IBCF_A
68											200 OK	IBCF_A forwards 200 OK response to IBCF_B
69											200 OK	IBCF_B forwards 200 OK response to IMS_B
70											200 OK	IMS_B forwards 200 OK response to AS/IM_B
71											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
72											200 OK	IMS_B forwards 200 OK response to IBCF_B
73											200 OK	IBCF_B forwards 200 OK response to IBCF_A



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
74				←	←						200 OK	IBCF_A forwards 200 OK response to IMS_A
75			←	←							200 OK	IMS_A forwards 200 OK response to AS/IM_A
76			→	→							200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
77		←		←							200 OK	IMS_A forwards 200 OK response to UE_A
78				←					←		SUBSCRIBE	UE_B subscribes to the conference event package
79				→	→						SUBSCRIBE	IMS_A forwards SUBSCRIBE to IBCF_A
80					→	→					SUBSCRIBE	IBCF_A forwards SUBSCRIBE to IBCF_B
81						→	→				SUBSCRIBE	IBCF_B forwards SUBSCRIBE to IMS_B
82							→	→			SUBSCRIBE	IMS_B forwards SUBSCRIBE to AS/IM_B
83							←	←			200 OK	AS/IM_B sends 200 OK for SUBSCRIBE
84						←	←				200 OK	IMS_B forwards 200 OK response to IBCF_B
85					←	←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
86				←	←						200 OK	IBCF_A forwards 200 OK response to IMS_A
87				→					→		200 OK	IMS_A forwards 200 OK response to UE_B
88							←	←			NOTIFY	AS/IM_B sends NOTIFY to UE_B with list of 1-to-many Chat participants
89						←	←				NOTIFY	IMS_B forwards NOTIFY to IBCF_B
90					←	←					NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
91				←	←						NOTIFY	IBCF_A forwards NOTIFY to IMS_A
92				→					→		NOTIFY	IMS_A forwards NOTIFY to UE_B
93									→	→		User B is notified with list of 1-to-many Chat participants
94				←					←		200 OK	UE_B responds with 200 OK to IMS_A
95				→	→						200 OK	IMS_A forwards 200 OK response to IBCF_A
96					→	→					200 OK	IBCF_A forwards 200 OK response to IBCF_B
97						→	→				200 OK	IBCF_B forwards 200 OK response to IMS_B
98							→	→			200 OK	IMS_B forwards 200 OK response to AS/IM_B
99		→		→							SUBSCRIBE	UE_A subscribes to the conference event package
100			←	←							SUBSCRIBE	IMS_A forwards SUBSCRIBE to AS/IM_A
101			→	→							SUBSCRIBE	AS/IM_A returns, possibly modified, SUBSCRIBE to IMS_A
102				→	→						SUBSCRIBE	IMS_A forwards SUBSCRIBE to IBCF_A
103					→	→					SUBSCRIBE	IBCF_A forwards SUBSCRIBE to IBCF_B

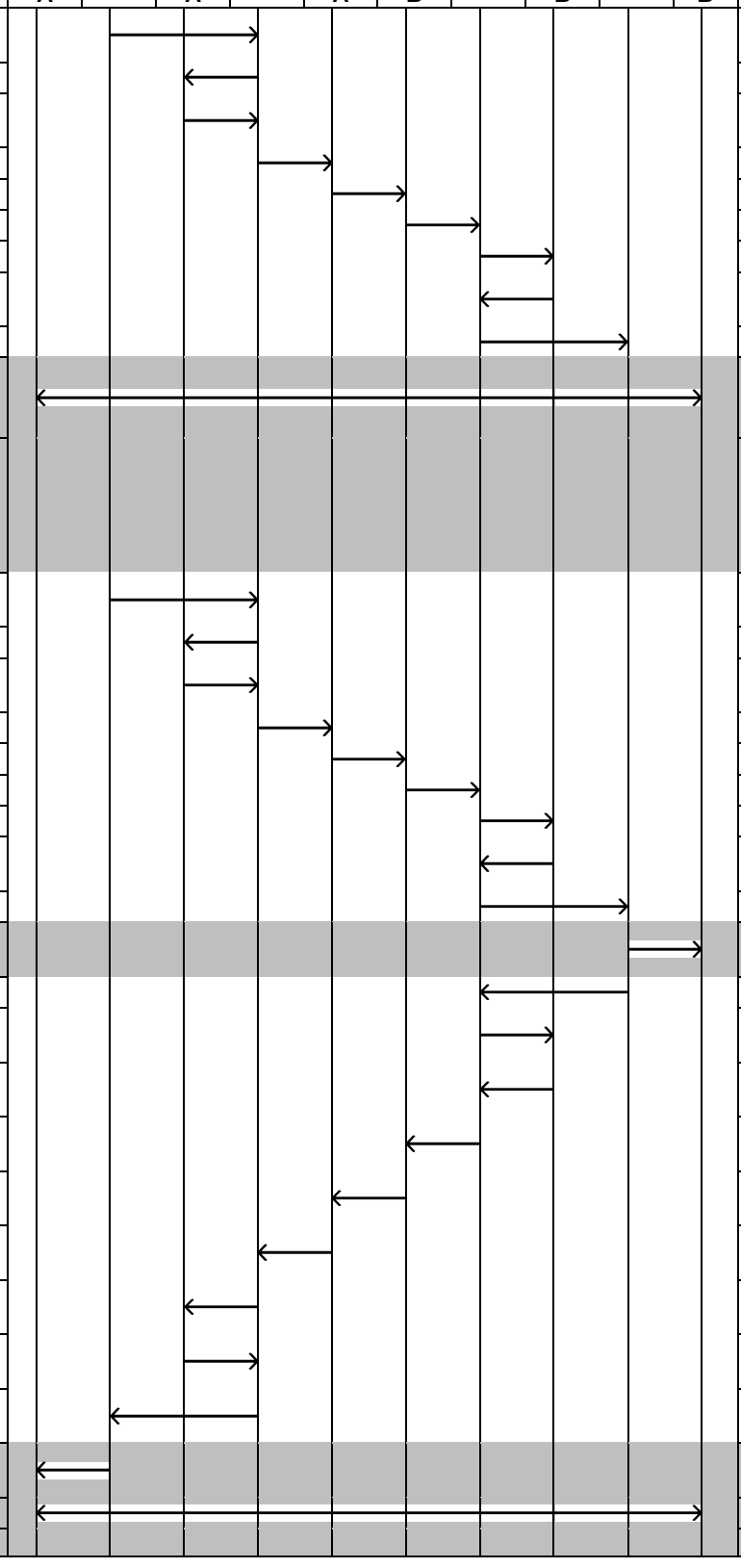
Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
104						→					SUBSCRIBE	IBCF_B forwards SUBSCRIBE to IMS_B
105							→				SUBSCRIBE	IMS_B forwards SUBSCRIBE to AS/IM_B
106							←				200 OK	AS/IM_B sends 200 OK for SUBSCRIBE
107						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
108					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
109				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
110			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
111			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
112		←									200 OK	IMS_A forwards 200 OK response to UE_A
113							←				NOTIFY	AS/IM_B sends NOTIFY to UE_A with list of 1-to-many Chat participants
114						←					NOTIFY	IMS_B forwards BYE to IBCF_B
115					←						NOTIFY	IBCF_B forwards BYE to IBCF_A
116				←							NOTIFY	IBCF_A forwards BYE to IMS_A
117			←								NOTIFY	IMS_A forwards BYE to AS/IM_A
118			→								NOTIFY	AS/IM_A returns, possibly modified, BYE to IMS_A
119		←									NOTIFY	IMS_A forwards BYE to UE_A
120	←											User A is notified with list of 1-to-many Chat participants
121		→	→								200 OK	UE_A sends 200 OK for NOTIFY
122			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
123			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
124				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
125					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
126						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
127							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
128	↔							↔		↔		Users perform messaging in the 1-to-many Chat (see clause 5.3.2.2 Chat 1 to many via MSRP - Roaming)
129												Continue UC_RCS_6_R (104A-146B)

4.5.3.4 File transfer within 1-to-1 chat

4.5.3.4.1 File transfer within 1-to-1 chat - interworking

Interoperability Test Description		
Identifier:	TD_IMS_CHAT_0009	
Summary:	IMS network supports 1-to-1 IM/Chat service and messages exchange between two users in their home network can be performed. User A starts file transfer with User B	
Configuration:	CF_INT_AS	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5107_01	TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 6th numbered list)
	TD_MSRP_FILE_0001	RFC 4975 [8], clauses 5.4, 7.1 and 7.2 RFC 5547 [11]
Use Case ref.:	UC_RCS_5_I & UC_MSRP_04	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B optionally using userPRES according to table 1 • UE_A, UE_B and UE_C shall support MSRP • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User A selects User B in the phone address book and sends him an initial message with MSRP indication
	2	User B is informed of incoming message
	3	User A is informed that initial message was delivered to user B
	4	User B reads the initial message from user A and opens the 1-to-1 chat
	5	Users perform chatting
	6	User A initiates a file transfer to user B
	7	User B is informed of incoming file and accepts the transfer
	8	User A is informed that file transfer has been accepted by user B
	9	File transfer starts (MSRP session)
	10	File transfer completed (size checked)
	11	User B is informed that file transfer completed
	12	User A is informed that file transfer completed
	13	Users continue chatting (MSRP session)
	14A	User A closes the 1-to-1 chat
	14B	User B closes the 1-to-1 chat
	15A	User A is informed that 1-to-1 chat with user B is closed
	15B	User B is informed that 1-to-1 chat with user A is closed
Conformance Criteria:	**Check**	
	1	TP_IMS_5107_01 in CFW step 47 (BYE): *ensure that {* *when { UE_A sends BYE to UE_B }* *then { IMS_B receives the BYE* *not containing Route_header* *indicating the S-CSCF_SIP_URI of IMS_A* *}* *}*

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
1												Follow UC_RCS_4_I (1-68)
2		→										User A initiates a file transfer to user B (MSRP session)
3			→	→							INVITE	UE_A sends INVITE to IMS_A to establish a new session with the SDP offer indicating all specific data for a new MSRP connection set up
4		←		←							100 Trying	IMS_A responds with a 100 Trying provisional response
5			←	←							INVITE	IMS_A forwards INVITE to AS/IM_A
6			→	→							100 Trying	AS/IM_A responds with a 100 Trying provisional response
7			→	→							INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
8			←	←							100 Trying	IMS_A responds with a 100 Trying provisional response
9				→	→						INVITE	IMS_A forwards INVITE to IBCF_A
10				←	←						100 Trying	IBCF_A responds with a 100 Trying provisional response
11					→	→					INVITE	IBCF_A forwards INVITE to IBCF_B
12					←	←					100 Trying	IBCF_B responds with a 100 Trying provisional response
13						→	→				INVITE	IBCF_B forwards INVITE to IMS_B
14						←	←				100 Trying	IMS_B responds with a 100 Trying provisional response
15							→	→			INVITE	IMS_B forwards INVITE to AS/IM_B
16							←	←			100 Trying	AS/IM_B responds with a 100 Trying provisional response
17							←	←			INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
18							→	→			100 Trying	IMS_B responds with a 100 Trying provisional response
19							→	→	→		INVITE	IMS_B forwards INVITE to UE_B
20							←	←	←		100 Trying	UE_B optionally responds with a 100 Trying provisional response
21									→	→		User B is informed of incoming file and accepts the transfer
22							←	←	←		200 OK	UE_B responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform A-side with specific data for a new MSRP connection set up
23							→	→			200 OK	IMS_B forwards 200 OK response to AS/IM_B
24							←	←			200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
25						←	←				200 OK	IMS_B forwards 200 OK response to IBCF_B
26					←	←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
27				←	←						200 OK	IBCF_A forwards 200 OK response to IMS_A
28			←	←							200 OK	IMS_A forwards 200 OK response to AS/IM_A
29			→	→							200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
30		←		←							200 OK	IMS_A forwards 200 OK response to UE_A
31	←											User A is informed that file transfer has been accepted by user B



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
32											ACK	UE_A acknowledges the receipt of 200 OK for INVITE
33											ACK	IMS_A forwards ACK to AS/IM_A
34											ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
35											ACK	IMS_A forwards ACK to IBCF_A
36											ACK	IBCF_A forwards ACK to IBCF_B
37											ACK	IBCF_B forwards ACK to IMS_B
38											ACK	IMS_B forwards ACK to AS/IM_B
39											ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
40											ACK	IMS_B forwards ACK to UE_B
41												File transfer starts (see clause 5.3.3 Image data via MSRP - CheckMSRP3)
42												File transfer completed (size checked) and users can continue with 1 to 1 chat (see clause 5.3.1 Chat 1 to 1 via MSRP-CheckMSRP3)
43											BYE	UE_A releases the file transfer session with BYE
44											BYE	IMS_A forwards BYE to AS/IM_A
45											BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
46											BYE	IMS_A forwards BYE to IBCF_A
47											BYE	IBCF_A forwards BYE to IBCF_B
48											BYE	IBCF_B forwards BYE to IMS_B
49											BYE	IMS_B forwards BYE to AS/IM_B
50											BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
51											BYE	IMS_B forwards BYE to UE_B
52												User B is informed that file transfer completed
53											200 OK	UE_B sends 200 OK for BYE
54											200 OK	IMS_B forwards 200 OK response to AS/IM_B
55											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
56											200 OK	IMS_B forwards 200 OK response to IBCF_B
57											200 OK	IBCF_B forwards 200 OK response to IBCF_A
58											200 OK	IBCF_A forwards 200 OK response to IMS_A
59											200 OK	IMS_A forwards 200 OK response to AS/IM_A
60											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
61											200 OK	IMS_A forwards 200 OK response to UE_A
62												User A is informed that file transfer completed
63												Users continue chatting
64												Continue UC_RCS_4_I *(69A-88B)*

4.5.3.4.2 File transfer within 1-to-1 chat - roaming (optional)

Interoperability Test Description		
Identifier:	TD_IMS_CHAT_0010	
Summary:	IMS network supports 1-to-1 IM/Chat service and messages exchange between two users, one user in its home network and one user roaming can be performed. User B starts file transfer with User A	
Configuration:	CF_ROAM_AS (OPTIONAL)	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5052_01	TS 124 229 [1], clause 5.2.6.3-9 ¶1 (1st numbered list)
	TD_MSRP_FILE_0001	RFC 4975 [8], clauses 5.4, 7.1 & 7.2 RFC 5547 [11]
Use Case ref.:	UC_RCS_5_R & UC_MSRP_04	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B via IMS_A optionally using userPRES according to table 1 • UE_A, UE_B and UE_C shall support MSRP • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User B selects User A in the phone address book and sends him an initial message
	2	User A is informed of incoming message
	3	User B is informed that initial message was delivered to user A
	4	User A reads the initial message from user B and opens the 1-to-1 chat
	5	Users perform chatting
	6	User B initiates a file transfer to user A
	7	User A is informed of incoming file and accepts the transfer
	8	User B is informed that file transfer has been accepted by user B
	9	File transfer starts
	10	File transfer completed (size checked)
	11	User A is informed that file transfer completed
	12	User B is informed that file transfer completed
	13	Users continue chatting
	14A	User B closes the 1-to-1 chat
	14B	User A closes the 1-to-1 chat
	15A	User B is informed that that 1-to-1 chat with user A is closed
	15B	User A is informed that that 1-to-1 chat with user B is closed
Conformance Criteria:	**Check**	
	1	TP_IMS_5052_01 in CFW step 57 (BYE): *ensure that {* *when { IMS_A receives a BYE from UE_B }* *then { IMS_A sends the BYE to IMS_B* *not containing a Route_header* *indicating the P-CSCF_SIP_URI of IMS_A and* *containing the same Record-Route_header* *as in the previous ACK and* *containing a P-Charging-Vector header* *containing an icid-value_parameter* *}* *}*

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
1												Follow UC_RCS_4_R (1-89)
2									←			User B initiates a file transfer to user A (MSRP session)
3				←					←		INVITE	UE_B sends INVITE to IMS_A to establish a new session with the SDP offer indicating all specific data for a new MSRP connection set up
4				→					→		100 Trying	IMS_A responds with a 100 Trying provisional response
5				→	→						INVITE	IMS_A forwards INVITE to IBCF_A
6				←	←						100 Trying	IBCF_A responds with a 100 Trying provisional response
7					→	→					INVITE	IBCF_A forwards INVITE to IBCF_B
8					←	←					100 Trying	IBCF_B responds with a 100 Trying provisional response
9						→	→				INVITE	IBCF_B forwards INVITE to IMS_B
10						←	←				100 Trying	IMS_B responds with a 100 Trying provisional response
11							→	→			INVITE	IMS_B forwards INVITE to AS/IM_B
12							←	←			100 Trying	AS/IM_B responds with a 100 Trying provisional response
13							←	←			INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
14							→	→			100 Trying	IMS_B responds with a 100 Trying provisional response
15						←	←				INVITE	IMS_B forwards INVITE to IBCF_B
16						→	→				100 Trying	IBCF_B responds with a 100 Trying provisional response
17					←	←					INVITE	IBCF_B forwards INVITE to IBCF_A
18					→	→					100 Trying	IBCF_A responds with a 100 Trying provisional response
19				←	←						INVITE	IBCF_A forwards INVITE to IMS_A
20				→	→						100 Trying	IMS_A responds with a 100 Trying provisional response
21			←	←							INVITE	IMS_A forwards INVITE to AS/IM_A
22			→	→							100 Trying	AS/IM_A responds with a 100 Trying provisional response
23			→	→							INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
24			←	←							100 Trying	IMS_A responds with a 100 Trying provisional response
25		←	←	←							INVITE	IMS_A forwards INVITE to UE_A
26		→	→	→							100 Trying	UE_A optionally responds with a 100 Trying provisional response
27	←	←										User A is informed of incoming file and accepts the transfer
28		→	→	→							200 OK	UE_A responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform B-side with specific data for a new MSRP connection set up
29			←	←							200 OK	IMS_A forwards 200 OK response to AS/IM_A
30			→	→							200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
31				→	→						200 OK	IMS_A forwards 200 OK response to IBCF_A
32					→	→					200 OK	IBCF_A forwards 200 OK response to IBCF_B

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
33						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
34							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
35							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
36						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
37					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
38				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
39				→				→			200 OK	IMS_A forwards 200 OK response to UE_B
40									→			User B is informed that file transfer has been accepted by user B
41				←				←			ACK	UE_B acknowledges the receipt of 200 OK for INVITE
42				→							ACK	IMS_A forwards ACK to IBCF_A
43					→						ACK	IBCF_A forwards ACK to IBCF_B
44						→					ACK	IBCF_B forwards ACK to IMS_B
45							→				ACK	IMS_B forwards ACK to AS/IM_B
46							←				ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
47						←					ACK	IMS_B forwards ACK to IBCF_B
48					←						ACK	IBCF_B forwards ACK to IBCF_A
49				←							ACK	IBCF_A forwards ACK to IMS_A
50			←								ACK	IMS_A forwards ACK to AS/IM_A
51			→								ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
52		←									ACK	IMS_A forwards ACK to UE_A
53	←									→		File transfer starts (see clause 5.3.3 Image data via MSRP)
54												File transfer completed (size checked) and users can continue with 1 to 1 chat (see clause 5.3.1 Chat 1 to 1 via MSRP)
55				←				←			BYE	UE_B releases the file transfer session with BYE
56				→							BYE	IMS_A forwards BYE to IBCF_A
57					→						BYE	IBCF_A forwards BYE to IBCF_B
58						→					BYE	IBCF_B forwards BYE to IMS_B
59							→				BYE	IMS_B forwards BYE to AS/IM_B
60							←				BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
61						←					BYE	IMS_B forwards BYE to IBCF_B
62					←						BYE	IBCF_B forwards BYE to IBCF_A
63				←							BYE	IBCF_A forwards BYE to IMS_A
64			←								BYE	IMS_A forwards BYE to AS/IM_A
65			→								BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
66		←									BYE	IMS_A forwards BYE to UE_A
67												User A is informed that file transfer completed
68		→									200 OK	UE_A sends 200 OK for BYE
69			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
70			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
71				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
72					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
73						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
74							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
75							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
76						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
77					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
78				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
79				→	→	→	→	→	→		200 OK	IMS_A forwards 200 OK response to UE_B
80									→	→		User B is informed that file transfer completed
81	←	←	←	←	←	←	←	←	←	←		Users continue chatting
82												Continue UC_RCS_4_R (90A-115B)

4.5.3.5 File transfer rejection within 1-to-1 chat

4.5.3.5.1 File transfer rejection within 1-to-1 chat - interworking

Interoperability Test Description		
Identifier:	TD_IMS_CHAT_0011	
Summary:	IMS network supports 1-to-1 IM/Chat service and messages exchange between two users in their home network can be performed. User A starts file transfer with User B, but User B rejects invitation	
Configuration:	CF_INT_AS	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5313_01	TS 124 229 [1], clause 5.4.6.1.3 ¶2
Use Case ref.:	UC_RCS_5_I	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User A selects User B in the phone address book and sends him an initial message
	2	User B is informed of incoming message
	3	User A is informed that initial message was delivered to user B
	4	User B reads the initial message from user A and opens the 1-to-1 chat

Interoperability Test Description		
	5	Users perform chatting
	6	User A initiates a file transfer to user B
	7	User B is informed of incoming file and rejects the transfer
	8	User A is informed that file transfer has been rejected by user B
	9	Users continue chatting
	10A	User A closes the 1-to-1 chat
	10B	User B closes the 1-to-1 chat
	11A	User A is informed that 1-to-1 chat with user B is closed
	11B	User B is informed that 1-to-1 chat with user A is closed
Conformance Criteria:	**Check**	
	1	TP_IMS_5313_01 in CFW step 28 (603 Decline): *ensure that {* *when { UE_B sends 603 Decline to UE_A }* *then { AS_A receives the 603 Decline from IMS_A* *containing P-Charging-Vector_header_header* *indicating an access-network-charging-info_parameter* *}* *}*

Step	Direction										Message	Comment
	User A	UE A	AS/ IMA	IMS A	IBCF A	IBCF B	IMS B	AS/ IMB	UE B	User B		
1												Follow UC_RCS_4_I (1-68)
2		→										User A initiates a file transfer to user B
3			→	→							INVITE	UE_A sends INVITE to IMS_A to establish a new session with the SDP offer indicating all specific data for a new MSRP connection set up
4			←	←							100 Trying	IMS_A responds with a 100 Trying provisional response
5				←							INVITE	IMS_A forwards INVITE to AS/IM_A
6				→							100 Trying	AS/IM_A responds with a 100 Trying provisional response
7				→							INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
8				←							100 Trying	IMS_A responds with a 100 Trying provisional response
9					→						INVITE	IMS_A forwards INVITE to IBCF_A
10					←						100 Trying	IBCF_A responds with a 100 Trying provisional response
11						→					INVITE	IBCF_A forwards INVITE to IBCF_B
12						←					100 Trying	IBCF_B responds with a 100 Trying provisional response
13							→				INVITE	IBCF_B forwards INVITE to IMS_B
14							←				100 Trying	IMS_B responds with a 100 Trying provisional response
15								→			INVITE	IMS_B forwards INVITE to AS/IM_B
16								←			100 Trying	AS/IM_B responds with a 100 Trying provisional response
17								←			INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
18								→			100 Trying	IMS_B responds with a 100 Trying provisional response
19									→		INVITE	IMS_B forwards INVITE to UE_B
20									←		100 Trying	UE_B optionally responds with a 100 Trying provisional response
21									→			User B is informed of incoming file and rejects the transfer

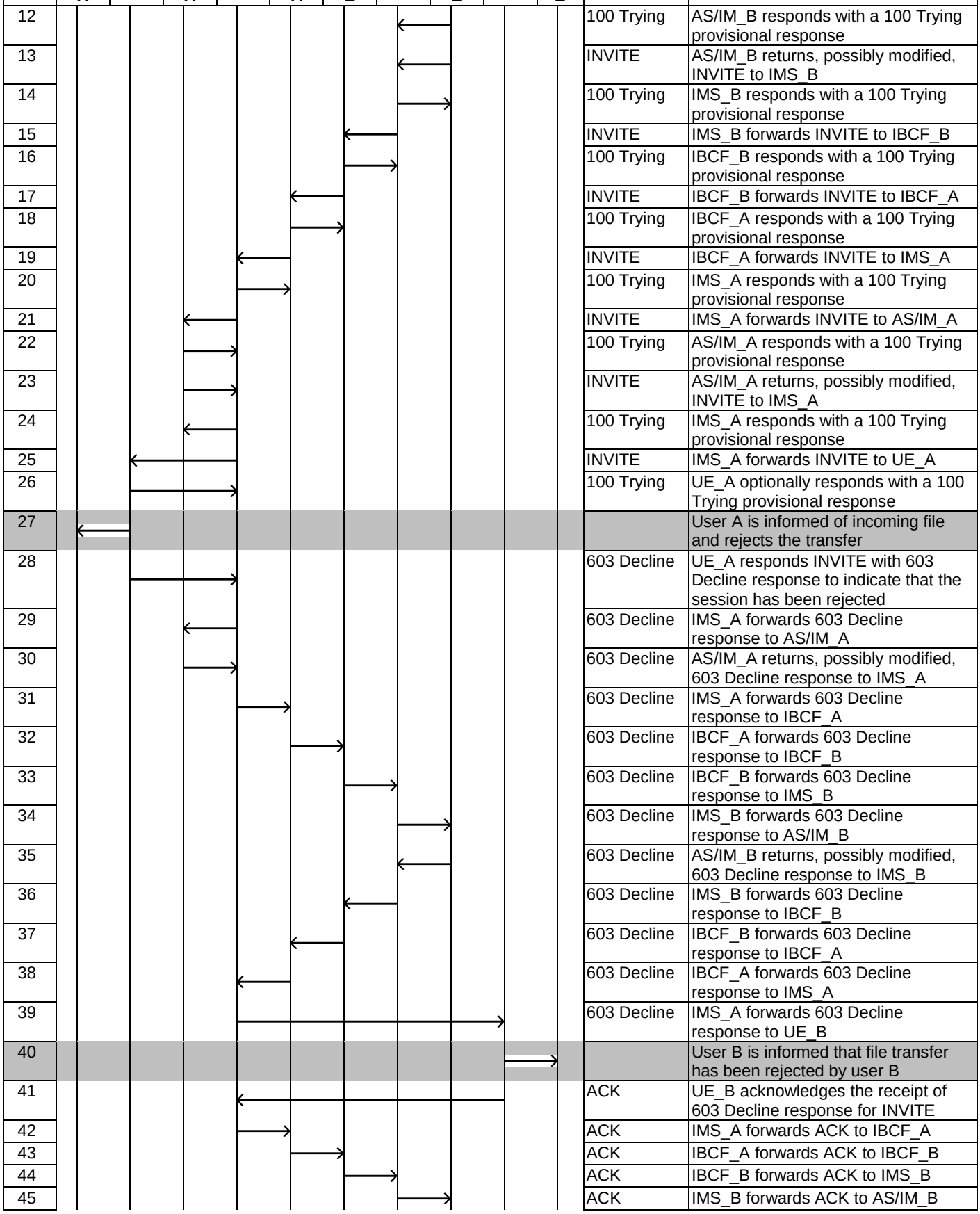
Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
22											603 Decline	UE_B responds INVITE with 603 Decline response to indicate that the session has been rejected
23											603 Decline	IMS_B forwards 603 Decline response to AS/IM_B
24											603 Decline	AS/IM_B returns, possibly modified, 603 Decline response to IMS_B
25											603 Decline	IMS_B forwards 603 Decline response to IBCF_B
26											603 Decline	IBCF_B forwards 603 Decline response to IBCF_A
27											603 Decline	IBCF_A forwards 603 Decline response to IMS_A
28											603 Decline	IMS_A forwards 603 Decline response to AS/IM_A
29											603 Decline	AS/IM_A returns, possibly modified, 603 Decline response to IMS_A
30											603 Decline	IMS_A forwards 603 Decline response to UE_A
31												User A is informed that file transfer has been rejected by user B
32											ACK	UE_A acknowledges the receipt of 603 Decline response for INVITE
33											ACK	IMS_A forwards ACK to AS/IM_A
34											ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
35											ACK	IMS_A forwards ACK to IBCF_A
36											ACK	IBCF_A forwards ACK to IBCF_B
37											ACK	IBCF_B forwards ACK to IMS_B
38											ACK	IMS_B forwards ACK to AS/IM_B
39											ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
40											ACK	IMS_B forwards ACK to UE_B
41												Users continue chatting (see clause 5.3.1 Chat 1 to 1 via MSRP - CheckMSRP3)
42												Continue UC_RCS_4_I *(69A-88B)*

4.5.3.5.2 File transfer rejection within 1-to-1 chat - roaming (optional)

Interoperability Test Description		
Identifier:	TD_IMS_CHAT_0012	
Summary:	IMS network supports 1-to-1 IM/Chat service and messages exchange between two users, one user in its home network and one user roaming can be performed. User B starts file transfer with User A, but User A rejects invitation	
Configuration:	CF_ROAM_AS (OPTIONAL)	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5313_01	TS 124 229 [1], clause 5.4.6.1.3 ¶2
	TD_MSRP_FILE_0001	RFC 4975 [8], clauses 5.4, 7.1 and 7.2 RFC 5547 [11]
Use Case ref.:	UC_RCS_5_R & UC_MSRP_02	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1	

Interoperability Test Description		
	• UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B via IMS_A optionally using userPRES according to table 1 • UE_A, UE_B and UE_C shall support MSRP • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User B selects User A in the phone address book and sends him an initial message with MSRP indication
	2	User A is informed of incoming message
	3	User B is informed that initial message was delivered to user A
	4	User A reads the initial message from user B and opens the 1-to-1 chat
	5	Users perform chatting (MSRP session)
	6	User B initiates a file transfer to user A
	7	User A is informed of incoming file and rejects the transfer
	8	User B is informed that file transfer has been rejected by user B
	9	Users continue chatting (MSRP session)
	10A	User B closes the 1-to-1 chat
	10B	User A closes the 1-to-1 chat
	11A	User B is informed that that 1-to-1 chat with user A is closed
	11B	User A is informed that that 1-to-1 chat with user B is closed
Conformance Criteria:	**Check**	
	1	TP_IMS_5313_01 in CFW step 34 (603 Decline): *ensure that {* *when { UE_A sends 603 Decline to UE_B }* *then { AS_B receives the 603 Decline from IMS_B* *containing P-Charging-Vector_header_header* *indicating an access-network-charging-info_parameter* *}* *}*

Step	Direction										Message	Comment
	User A	UE A	AS/IMA	IMS A	IBCF A	IBCF B	IMS B	AS/IMB	UE B	User B		
1												Follow UC_RCS_4_R (1-89)
2									←			User B initiates a file transfer to user A
3				←							INVITE	UE_B sends INVITE to IMS_A to establish a new session with the SDP offer indicating all specific data for a new MSRP connection set up (MSRP session)
4				→							100 Trying	IMS_A responds with a 100 Trying provisional response
5				→							INVITE	IMS_A forwards INVITE to IBCF_A
6				←							100 Trying	IBCF_A responds with a 100 Trying provisional response
7					→						INVITE	IBCF_A forwards INVITE to IBCF_B
8					←						100 Trying	IBCF_B responds with a 100 Trying provisional response
9						→					INVITE	IBCF_B forwards INVITE to IMS_B
10						←					100 Trying	IMS_B responds with a 100 Trying provisional response
11							→				INVITE	IMS_B forwards INVITE to AS/IM_B



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
12											100 Trying	AS/IM_B responds with a 100 Trying provisional response
13											INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
14											100 Trying	IMS_B responds with a 100 Trying provisional response
15											INVITE	IMS_B forwards INVITE to IBCF_B
16											100 Trying	IBCF_B responds with a 100 Trying provisional response
17											INVITE	IBCF_B forwards INVITE to IBCF_A
18											100 Trying	IBCF_A responds with a 100 Trying provisional response
19											INVITE	IBCF_A forwards INVITE to IMS_A
20											100 Trying	IMS_A responds with a 100 Trying provisional response
21											INVITE	IMS_A forwards INVITE to AS/IM_A
22											100 Trying	AS/IM_A responds with a 100 Trying provisional response
23											INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
24											100 Trying	IMS_A responds with a 100 Trying provisional response
25											INVITE	IMS_A forwards INVITE to UE_A
26											100 Trying	UE_A optionally responds with a 100 Trying provisional response
27												User A is informed of incoming file and rejects the transfer
28											603 Decline	UE_A responds INVITE with 603 Decline response to indicate that the session has been rejected
29											603 Decline	IMS_A forwards 603 Decline response to AS/IM_A
30											603 Decline	AS/IM_A returns, possibly modified, 603 Decline response to IMS_A
31											603 Decline	IMS_A forwards 603 Decline response to IBCF_A
32											603 Decline	IBCF_A forwards 603 Decline response to IBCF_B
33											603 Decline	IBCF_B forwards 603 Decline response to IMS_B
34											603 Decline	IMS_B forwards 603 Decline response to AS/IM_B
35											603 Decline	AS/IM_B returns, possibly modified, 603 Decline response to IMS_B
36											603 Decline	IMS_B forwards 603 Decline response to IBCF_B
37											603 Decline	IBCF_B forwards 603 Decline response to IBCF_A
38											603 Decline	IBCF_A forwards 603 Decline response to IMS_A
39											603 Decline	IMS_A forwards 603 Decline response to UE_B
40												User B is informed that file transfer has been rejected by user B
41											ACK	UE_B acknowledges the receipt of 603 Decline response for INVITE
42											ACK	IMS_A forwards ACK to IBCF_A
43											ACK	IBCF_A forwards ACK to IBCF_B
44											ACK	IBCF_B forwards ACK to IMS_B
45											ACK	IMS_B forwards ACK to AS/IM_B

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
46											ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
47											ACK	IMS_B forwards ACK to IBCF_B
48											ACK	IBCF_B forwards ACK to IBCF_A
49											ACK	IBCF_A forwards ACK to IMS_A
50											ACK	IMS_A forwards ACK to AS/IM_A
51											ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
52											ACK	IMS_A forwards ACK to UE_A
53												Users continue chatting (see clause 5.3.1 Chat 1 to 1 via MSRP - CheckMSRP3)
54												Continue UC_RCS_4_R (90A-115B)

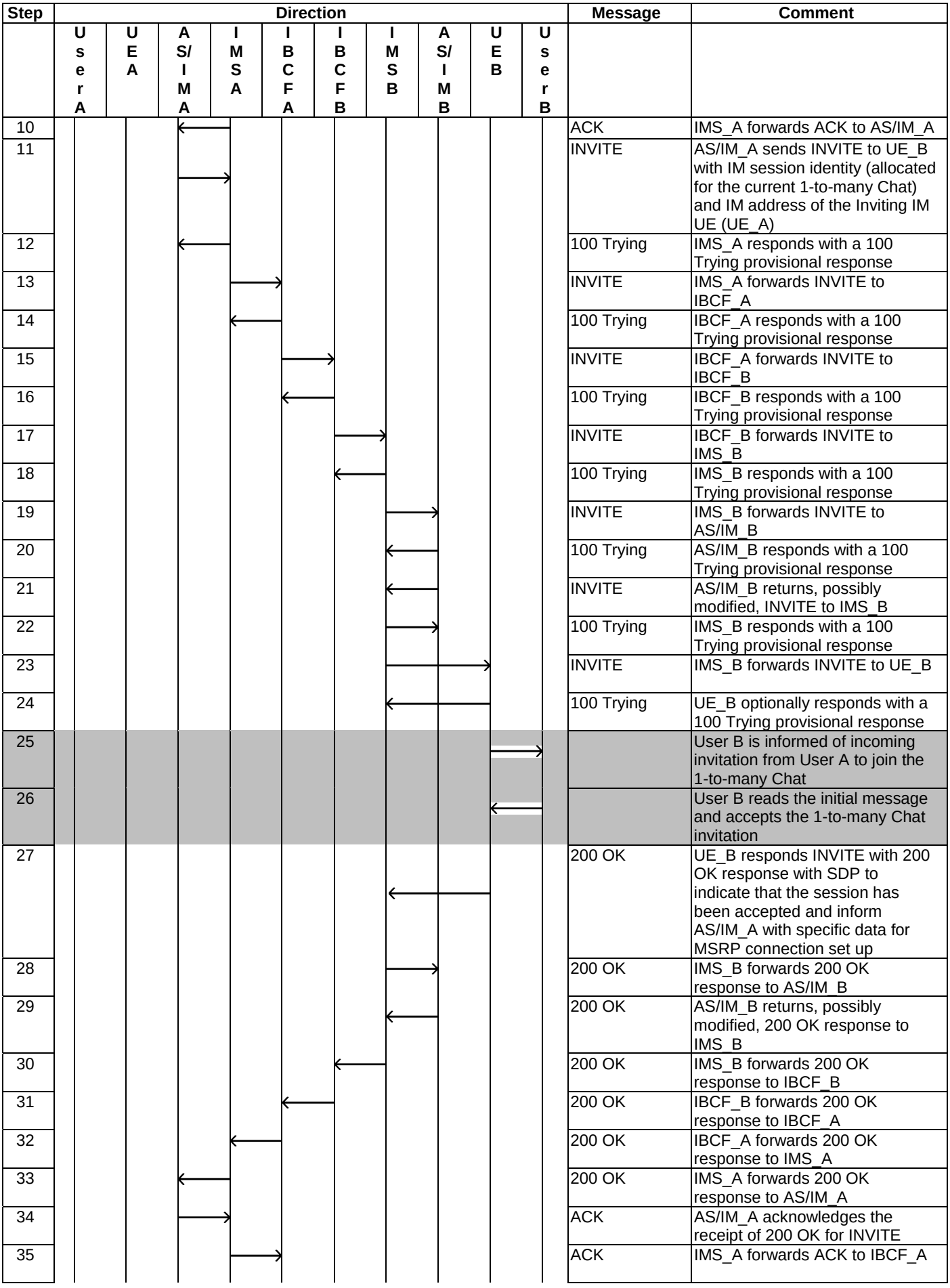
4.5.3.6 1-to-many chat

4.5.3.6.1 1-to-many chat - interworking

Interoperability Test Description		
Identifier:	TD_IMS_CHAT_0013	
Summary:	IMS network supports 1-to-many IM/Chat service and messages exchange between two users in their home network can be performed. User A starts 1-to-many chat with users B and C	
Configuration:	CF_INT_AS	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5107_01	TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 6th numbered list)
	TD_MSRP_FILE_0001	RFC 4975 [8], clauses 5.4, 7.1 and 7.2 RFC 5547 [11]
Use Case ref.:	UC_RCS_6_I & UC_MSRP_02	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A, UE_C and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B and UE_C are registered in IMS_B optionally using userPRES according to table 1 • UE_A, UE_B and UE_C shall support MSRP • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A, UE_C and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User A initiates a 1-to-many Chat with User B and User C by sending initial message
	2	User A is informed that the 1-to-many Chat is established
	3	User B is informed of incoming invitation from User A to join the 1-to-many Chat
	4	User B reads the initial message and accepts the 1-to-many Chat invitation
	5	User A is notified with list of 1-to-many Chat participants
	6	User B is notified with list of 1-to-many Chat participants
	7	Users perform messaging in the 1-to-many Chat

Interoperability Test Description		
	8A	User B leaves the 1-to-many Chat
	8B	User A leaves the 1-to-many Chat
	9A	User B is informed that he has left the 1-to-many Chat
	9B	User A is informed that he has left the 1-to-many Chat
	10A	User A is notified that all other users have left the 1-to-many Chat
	10B	User B is notified that all other users have left the 1-to-many Chat
	11A	User A leaves the 1-to-many Chat
	11B	User B leaves the 1-to-many Chat
	12A	User A is informed that the 1-to-many Chat has ended
	12B	User B is informed that the 1-to-many Chat has ended
Conformance Criteria:	**Check**	
	1	TP_IMS_5107_01 in CFW step 85A and 196B (BYE): *ensure that {* *when { UE_A sends BYE to UE_B }* *then { IMS_B receives the BYE* *not containing Route_header* *indicating the S-CSCF_SIP_URI of IMS_A* *}* *}*

Step	Direction										Message	Comment
	User A	UE A	AS/IMA	IMS A	IBCF A	IBCF B	IMS B	AS/IMB	UE B	User B		
1												User A initiates a 1-to-many Chat with User B and User C by sending initial message
2											INVITE	UE_A sends INVITE to IMS_A with Request-URI set to IM CONF-FCTY-URI (conference factory uri), MIME resource-list body including invited IM Users and the first SDP offer indicating all specific data for MSRP connection set up (CheckMSRP1)
3											100 Trying	IMS_A responds with a 100 Trying provisional response
4											INVITE	IMS_A forwards INVITE to AS/IM_A
5											100 Trying	AS/IM_A responds with a 100 Trying provisional response
6											200 OK	AS/IM_A responds INVITE with 200 OK response with IM session Identity allocated for the current 1-to-many Chat to indicate that the session has been accepted and SDP to inform A-side with specific data for MSRP connection set up
7											200 OK	IMS_A forwards 200 OK response to AS/IM_A
8												User A is informed that the 1-to-many Chat is established
9											ACK	UE_A acknowledges the receipt of 200 OK for INVITE



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
10			←								ACK	IMS_A forwards ACK to AS/IM_A
11			→								INVITE	AS/IM_A sends INVITE to UE_B with IM session identity (allocated for the current 1-to-many Chat) and IM address of the Inviting IM UE (UE_A)
12			←								100 Trying	IMS_A responds with a 100 Trying provisional response
13				→							INVITE	IMS_A forwards INVITE to IBCF_A
14				←							100 Trying	IBCF_A responds with a 100 Trying provisional response
15					→						INVITE	IBCF_A forwards INVITE to IBCF_B
16					←						100 Trying	IBCF_B responds with a 100 Trying provisional response
17						→					INVITE	IBCF_B forwards INVITE to IMS_B
18						←					100 Trying	IMS_B responds with a 100 Trying provisional response
19							→				INVITE	IMS_B forwards INVITE to AS/IM_B
20							←				100 Trying	AS/IM_B responds with a 100 Trying provisional response
21							←				INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
22							→				100 Trying	IMS_B responds with a 100 Trying provisional response
23							→		→		INVITE	IMS_B forwards INVITE to UE_B
24							←		←		100 Trying	UE_B optionally responds with a 100 Trying provisional response
25									→			User B is informed of incoming invitation from User A to join the 1-to-many Chat
26									←			User B reads the initial message and accepts the 1-to-many Chat invitation
27							←		←		200 OK	UE_B responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform AS/IM_A with specific data for MSRP connection set up
28							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
29							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
30						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
31					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
32				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
33			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
34			→								ACK	AS/IM_A acknowledges the receipt of 200 OK for INVITE
35				→							ACK	IMS_A forwards ACK to IBCF_A

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
36					→						ACK	IBCF_A forwards ACK to IBCF_B
37						→					ACK	IBCF_B forwards ACK to IMS_B
38							→				ACK	IMS_B forwards ACK to AS/IM_B
39							←				ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
40							→		→		ACK	IMS_B forwards ACK to UE_B
41		→	→								SUBSCRIBE	UE_A subscribes to the conference event package
42			←								SUBSCRIBE	IMS_A forwards SUBCRIBE to AS/IM_A
43			→								200 OK	AS/IM_A sends 200 OK for SUBSCRIBE
44		←									200 OK	IMS_A forwards 200 OK response to UE_A
45			→								NOTIFY	AS/IM_A sends NOTIFY to UE_A with list of 1-to-many Chat participants
46		←									NOTIFY	IMS_A forwards the NOTIFY to UE_A
47	←											User A is notified with list of 1-to-many Chat participants
48		→	→								200 OK	UE_A responds with 200 OK to IMS_A
49			←								200 OK	IMS_A forwards the 200 OK response to AS/IM_A
50							←		←		SUBSCRIBE	UE_B subscribes to the conference event package
51							→	→			SUBSCRIBE	IMS_B forwards SUBSCRIBE to AS/IM_B
52							←	←			SUBSCRIBE	AS/IM_B returns, possibly modified, SUBSCRIBE to IMS_B
53						←					SUBSCRIBE	IMS_B forwards SUBSCRIBE to IBCF_B
54					←						SUBSCRIBE	IBCF_B forwards SUBSCRIBE to IBCF_A
55				←							SUBSCRIBE	IBCF_A forwards SUBSCRIBE to IMS_A
56			←								SUBSCRIBE	IMS_A forwards SUBSCRIBE to AS/IM_A
57			→								200 OK	AS/IM_A sends 200 OK for SUBSCRIBE
58				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
59					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
60						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
61							→	→			200 OK	IMS_B forwards 200 OK response to AS/IM_B
62							←	←			200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
63							→		→		200 OK	IMS_B forwards 200 OK response to UE_B
64			→	→							NOTIFY	AS/IM_A sends NOTIFY to UE_B with list of 1-to-many Chat participants

Step	Direction										Message	Comment
	User A	UEA	AS/IMA	IMSA	IBCFA	IBCFB	IMSB	AS/IMB	UEB	User B		
65				→							NOTIFY	IMS_A forwards BYE to IBCF_A
66					→						NOTIFY	IBCF_A forwards BYE to IBCF_B
67						→					NOTIFY	IBCF_B forwards BYE to IMS_B
68							→				NOTIFY	IMS_B forwards BYE to AS/IM_B
69							←				NOTIFY	AS/IM_B returns, possibly modified, BYE to IMS_B
70							→				NOTIFY	IMS_B forwards BYE to UE_B
71									→			User B is notified with list of 1-to-many Chat participants
72							←				200 OK	UE_B sends 200 OK for NOTIFY
73							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
74							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
75						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
76					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
77				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
78			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
79	←		←						→			Users perform messaging in the 1-to-many Chat (see clause 5.3.2.1Chat 1 to many via MSRP - Interworking)
80A									←			User B leaves the 1-to-many Chat
81A							←				BYE	UE_B sends BYE to IMS_B to leave the 1-to-many Chat
82A							→				BYE	IMS_B forwards BYE to AS/IM_B
83A							←				BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
84A						←					BYE	IMS_B forwards BYE to IBCF_B
85A					←						BYE	IBCF_B forwards BYE to IBCF_A
86A				←							BYE	IBCF_A forwards BYE to IMS_A
87A			←								BYE	IMS_A forwards BYE to AS/IM_A
88A			→								200 OK	AS/IM_A sends 200 OK for BYE
89A				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
90A					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
91A						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
92A							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
93A							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
94A							→		→		200 OK	IMS_B forwards 200 OK response to UE_B
95A									→			User B is informed that he has left the 1-to-many Chat
96A			→								NOTIFY	AS/IM_A sends NOTIFY to IMS _A to inform UE_A that User B has left the 1-to-many Chat
97A		←									NOTIFY	IMS_A forwards the NOTIFY to UE_A
98A	←											User A is notified that all other users have left the 1-to-many Chat
99A		→	→								200 OK	UE_A responds with 200 OK to IMS_A
100A			←								200 OK	IMS_A forwards the 200 OK response to AS/IM_A
101A	→											User A leaves the 1-to-many Chat
102A		→	→								BYE	UE_A sends BYE to IMS_A to leave the 1-to-many Chat
103A			←								BYE	IMS_A forwards BYE to AS/IM_A
104A			→								200 OK	AS/IM_A sends 200 OK for BYE
105A		←									200 OK	IMS_A forwards 200 OK response to UE_A
106A	←											User A is informed that the 1-to-many Chat has ended
80B	→											User A leaves the 1-to-many Chat
81B		→	→								BYE	UE_A sends BYE to IMS_A to leave the 1-to-many Chat
82B			←								BYE	IMS_A forwards BYE to AS/IM_A
83B			→								200 OK	AS/IM_A sends 200 OK for BYE
84B		←									200 OK	IMS_A forwards 200 OK response to UE_A
85B	←											User A is informed that he has left the 1-to-many Chat
86B			→								NOTIFY	AS/IM_A sends NOTIFY to IMS_A to inform UE_B that User A has left the 1-to-many Chat
87B				→	→						NOTIFY	IMS_A forwards BYE to IBCF_A
88B					→	→					NOTIFY	IBCF_A forwards BYE to IBCF_B
89B						→	→				NOTIFY	IBCF_B forwards BYE to IMS_B
90B							→	→			NOTIFY	IMS_B forwards BYE to AS/IM_B
91B							←				NOTIFY	AS/IM_B returns, possibly modified, BYE to IMS_B
92B							→		→		NOTIFY	IMS_B forwards BYE to UE_B
93B									→			User B is notified that all other users have left the 1-to-many Chat

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
94B							←		←		200 OK	UE_B sends 200 OK for NOTIFY
95B							→	←			200 OK	IMS_B forwards 200 OK response to AS/IM_B
96B							←	→			200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
97B						←	→				200 OK	IMS_B forwards 200 OK response to IBCF_B
98B					←	→					200 OK	IBCF_B forwards 200 OK response to IBCF_A
99B				←	→						200 OK	IBCF_A forwards 200 OK response to IMS_A
100B			←	→							200 OK	IMS_A forwards 200 OK response to AS/IM_A
101B									←	←		User B leaves the 1-to-many Chat
102B							←		←		BYE	UE_B sends BYE to IMS_B to leave the 1-to-many Chat
103B							→	←			BYE	IMS_B forwards BYE to AS/IM_B
104B							←	→			BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
105B						←	→				BYE	IMS_B forwards BYE to IBCF_B
106B					←	→					BYE	IBCF_B forwards BYE to IBCF_A
107B				←	→						BYE	IBCF_A forwards BYE to IMS_A
108B			←	→							BYE	IMS_A forwards BYE to AS/IM_A
109B			→	←							200 OK	AS/IM_A sends 200 OK for BYE
110B				→	←						200 OK	IMS_A forwards 200 OK response to IBCF_A
111B					→	←					200 OK	IBCF_A forwards 200 OK response to IBCF_B
112B						→	←				200 OK	IBCF_B forwards 200 OK response to IMS_B
113B							→	←			200 OK	IMS_B forwards 200 OK response to AS/IM_B
114B							←	→			200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
115B							→	→			200 OK	IMS_B forwards 200 OK response to UE_B
116B									→	→		User B is informed that the 1-to-many Chat has ended

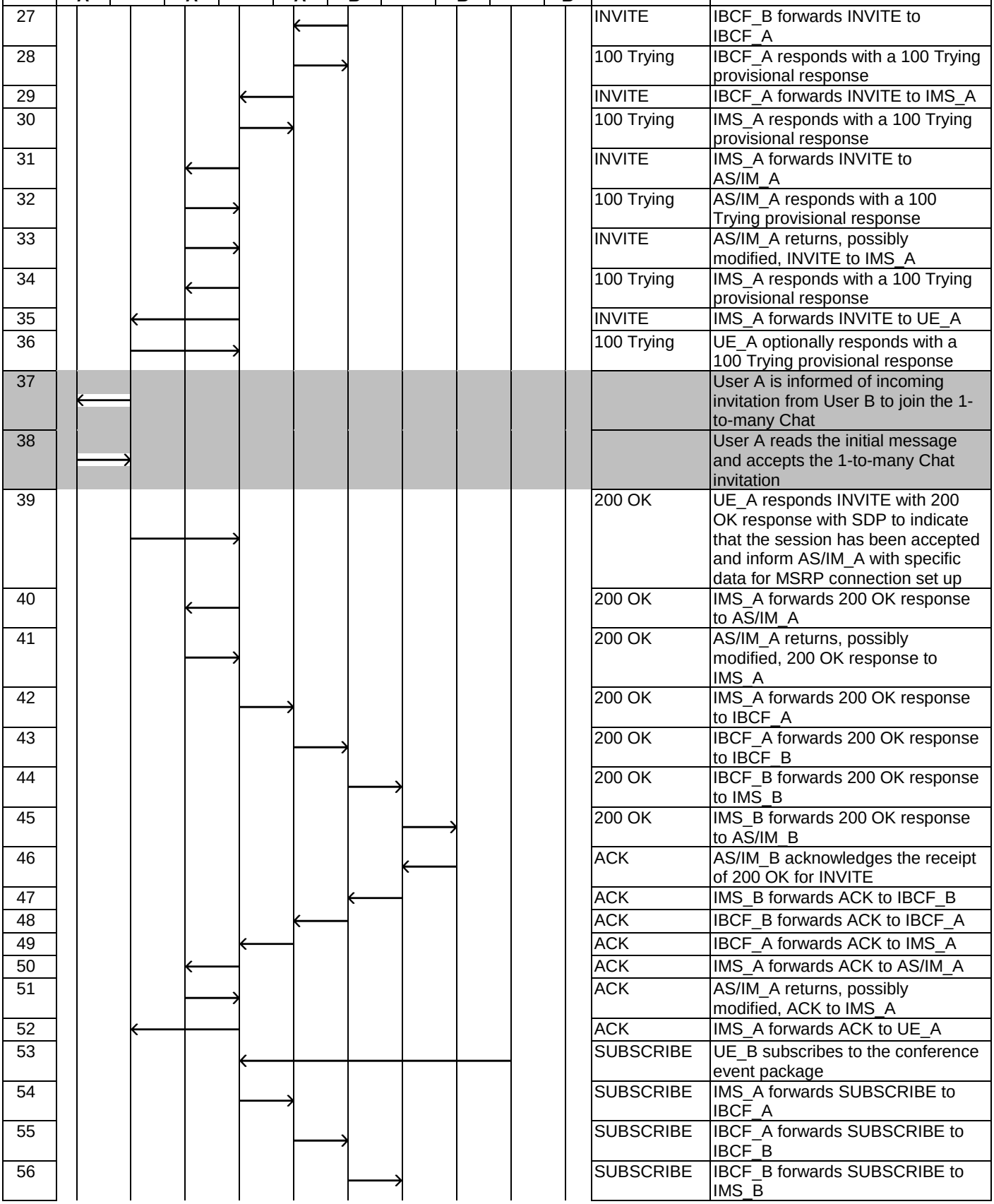
4.5.3.6.2 1-to-many chat - roaming (optional)

Interoperability Test Description	
Identifier:	TD_IMS_CHAT_0014
Summary:	IMS network supports 1-to-many IM/Chat service and messages exchange between two users, one user in its home network and one user roaming can be performed. User B starts 1-to-many chat with user A and C
Configuration:	CF_ROAM_AS (OPTIONAL)
SUT	IMS_A and IMS_B

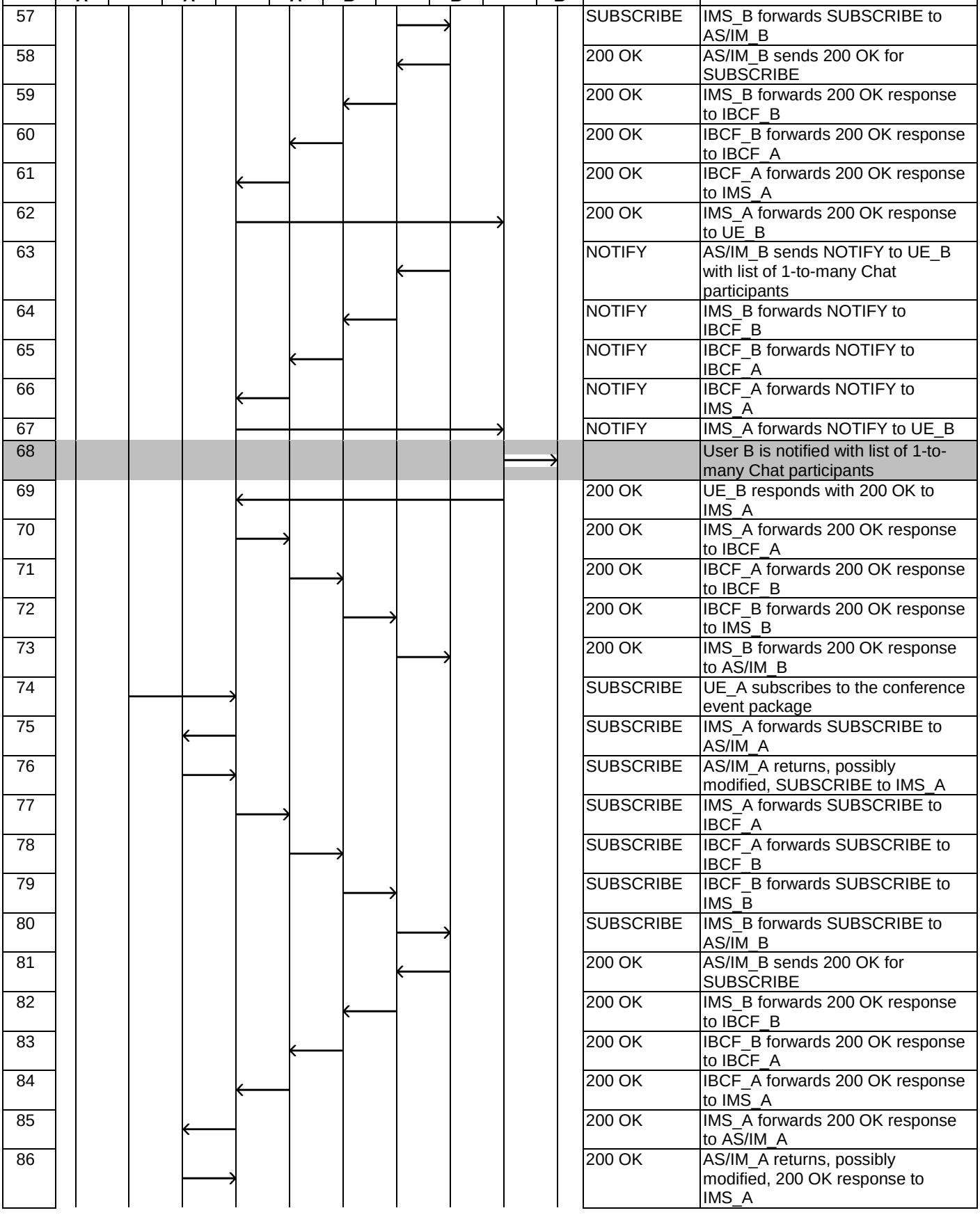
Interoperability Test Description		
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5052_01	TS 124 229 [1], clause 5.2.6.3-9 ¶1 (1st numbered list)
Use Case ref.:	UC_RCS_6_R	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A, UE_C and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B and UE_C are registered in IMS_B via IMS_A optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A, UE_C and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User B initiates a 1-to-many Chat with User A and User C by sending initial message
	2	User B is informed that the 1-to-many Chat is established
	3	User A is informed of incoming invitation from User B to join the 1-to-many Chat
	4	User A reads the initial message and accepts the 1-to-many Chat invitation
	5	User B is notified with list of 1-to-many Chat participants
	6	User A is notified with list of 1-to-many Chat participants
	7	Users perform messaging in the 1-to-many Chat
	8A	User A leaves the 1-to-many Chat
	8B	User B leaves the 1-to-many Chat
	9A	User A is informed that he has left the 1-to-many Chat
	9B	User B is informed that he has left the 1-to-many Chat
	10A	User B is notified that all other users have left the 1-to-many Chat
	10B	User A is notified that all other users have left the 1-to-many Chat
	11A	User B leaves the 1-to-many Chat
	11B	User A leaves the 1-to-many Chat
	12A	User B is informed that the 1-to-many Chat has ended
	12B	User A is informed that the 1-to-many Chat has ended
Conformance Criteria:	**Check**	

	1	TP_IMS_5052_01 in CFW step 134A and 107B (BYE):
		ensure that {
		when { IMS_A receives a BYE from UE_B }
		then { IMS_A sends the BYE to IMS_B
		not containing a Route_header
		indicating the P-CSCF_SIP_URI of IMS_A and
		containing the same Record-Route_header
		as in the previous ACK and
		containing a P-Charging-Vector header
		containing an icid-value_parameter
		}
		}

Step	Direction										Message	Comment
	User A	UE A	AS/IMA	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
1									←			User B initiates a 1-to-many Chat with User A and User C by sending initial message
2				←					←		INVITE	UE_B sends INVITE to IMS_A with Request-URI set to IM CONF-FCTY-URI (conference factory uri), MIME resource-list body including invited IM Users and the first SDP offer indicating all specific data for MSRP connection set up
3				→					→		100 Trying	IMS_A responds with a 100 Trying provisional response
4				→	→						INVITE	IMS_A forwards INVITE to IBCF_A
5				←	←						100 Trying	IBCF_A responds with a 100 Trying provisional response
6					→	→					INVITE	IBCF_A forwards INVITE to IBCF_B
7					←	←					100 Trying	IBCF_B responds with a 100 Trying provisional response
8						→	→				INVITE	IBCF_B forwards INVITE to IMS_B
9						←	←				100 Trying	IMS_B responds with a 100 Trying provisional response
10							→	→			INVITE	IMS_B forwards INVITE to AS/IM_B
11							←	←			100 Trying	AS/IM_B responds with a 100 Trying provisional response
12							←	←			200 OK	AS/IM_B responds INVITE with 200 OK response with IM session Identity allocated for the current 1-to-many Chat to indicate that the session has been accepted and SDP to inform A-side with specific data for MSRP connection set up
13						←	←				200 OK	IMS_B forwards 200 OK response to IBCF_B
14					←	←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
15				←	←						200 OK	IBCF_A forwards 200 OK response to IMS_A
16				→					→		200 OK	IMS_A forwards 200 OK response to UE_B
17									→			User B is informed that the 1-to-many Chat is established
18				←					←		ACK	UE_B acknowledges the receipt of 200 OK for INVITE
19				→	→						ACK	IMS_A forwards ACK to IBCF_A
20					→	→					ACK	IBCF_A forwards ACK to IBCF_B
21						→	→				ACK	IBCF_B forwards ACK to IMS_B
22							→	→			ACK	IMS_B forwards ACK to AS/IM_B
23							←	←			INVITE	AS/IM_B sends INVITE to UE_A with IM session identity (allocated for the current 1-to-many Chat) and IM address of the Inviting IM UE (UE_B)
24							→	→			100 Trying	IMS_B responds with a 100 Trying provisional response
25						←	←				INVITE	IMS_B forwards INVITE to IBCF_B
26						→	→				100 Trying	IBCF_B responds with a 100 Trying provisional response



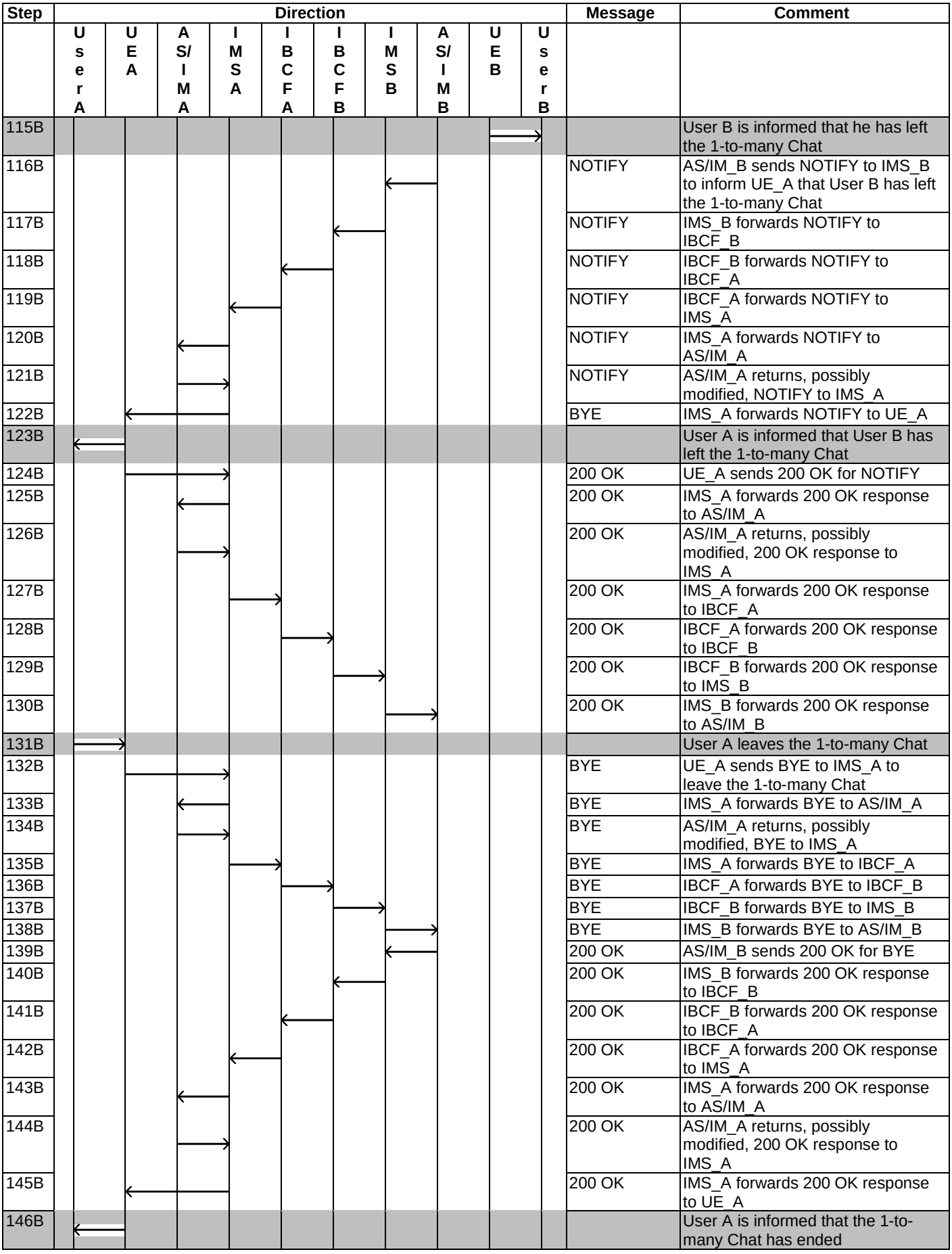
Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
27					←						INVITE	IBCF_B forwards INVITE to IBCF_A
28					→						100 Trying	IBCF_A responds with a 100 Trying provisional response
29				←							INVITE	IBCF_A forwards INVITE to IMS_A
30				→							100 Trying	IMS_A responds with a 100 Trying provisional response
31			←								INVITE	IMS_A forwards INVITE to AS/IM_A
32			→								100 Trying	AS/IM_A responds with a 100 Trying provisional response
33			→								INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
34			←								100 Trying	IMS_A responds with a 100 Trying provisional response
35		←									INVITE	IMS_A forwards INVITE to UE_A
36		→									100 Trying	UE_A optionally responds with a 100 Trying provisional response
37	←											User A is informed of incoming invitation from User B to join the 1-to-many Chat
38	→											User A reads the initial message and accepts the 1-to-many Chat invitation
39		→									200 OK	UE_A responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform AS/IM_A with specific data for MSRP connection set up
40			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
41			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
42				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
43					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
44						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
45							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
46								←			ACK	AS/IM_B acknowledges the receipt of 200 OK for INVITE
47						←					ACK	IMS_B forwards ACK to IBCF_B
48					←						ACK	IBCF_B forwards ACK to IBCF_A
49				←							ACK	IBCF_A forwards ACK to IMS_A
50			←								ACK	IMS_A forwards ACK to AS/IM_A
51			→								ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
52		←									ACK	IMS_A forwards ACK to UE_A
53				←					←		SUBSCRIBE	UE_B subscribes to the conference event package
54				→							SUBSCRIBE	IMS_A forwards SUBSCRIBE to IBCF_A
55					→						SUBSCRIBE	IBCF_A forwards SUBSCRIBE to IBCF_B
56						→					SUBSCRIBE	IBCF_B forwards SUBSCRIBE to IMS_B



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
57							→				SUBSCRIBE	IMS_B forwards SUBSCRIBE to AS/IM_B
58							←				200 OK	AS/IM_B sends 200 OK for SUBSCRIBE
59						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
60					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
61				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
62				→	→	→	→	→	→		200 OK	IMS_A forwards 200 OK response to UE_B
63							←				NOTIFY	AS/IM_B sends NOTIFY to UE_B with list of 1-to-many Chat participants
64						←					NOTIFY	IMS_B forwards NOTIFY to IBCF_B
65					←						NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
66				←							NOTIFY	IBCF_A forwards NOTIFY to IMS_A
67				→	→	→	→	→	→		NOTIFY	IMS_A forwards NOTIFY to UE_B
68									→			User B is notified with list of 1-to-many Chat participants
69				←	←	←	←	←	←		200 OK	UE_B responds with 200 OK to IMS_A
70				→	→						200 OK	IMS_A forwards 200 OK response to IBCF_A
71					→	→					200 OK	IBCF_A forwards 200 OK response to IBCF_B
72						→	→				200 OK	IBCF_B forwards 200 OK response to IMS_B
73							→	→			200 OK	IMS_B forwards 200 OK response to AS/IM_B
74		→	→	→							SUBSCRIBE	UE_A subscribes to the conference event package
75			←	←							SUBSCRIBE	IMS_A forwards SUBSCRIBE to AS/IM_A
76			→	→							SUBSCRIBE	AS/IM_A returns, possibly modified, SUBSCRIBE to IMS_A
77				→	→						SUBSCRIBE	IMS_A forwards SUBSCRIBE to IBCF_A
78					→	→					SUBSCRIBE	IBCF_A forwards SUBSCRIBE to IBCF_B
79						→	→				SUBSCRIBE	IBCF_B forwards SUBSCRIBE to IMS_B
80							→	→			SUBSCRIBE	IMS_B forwards SUBSCRIBE to AS/IM_B
81							←				200 OK	AS/IM_B sends 200 OK for SUBSCRIBE
82						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
83					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
84				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
85			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
86			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
87		←									200 OK	IMS_A forwards 200 OK response to UE_A
88							←				NOTIFY	AS/IM_B sends NOTIFY to UE_A with list of 1-to-many Chat participants
89						←					NOTIFY	IMS_B forwards NOTIFY to IBCF_B
90					←						NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
91				←							NOTIFY	IBCF_A forwards NOTIFY to IMS_A
92			←								NOTIFY	IMS_A forwards NOTIFY to AS/IM_A
93			→								NOTIFY	AS/IM_A returns, possibly modified, NOTIFY to IMS_A
94		←									NOTIFY	IMS_A forwards NOTIFY to UE_A
95	←											User A is notified with list of 1-to-many Chat participants
96		→									200 OK	UE_A sends 200 OK for NOTIFY
97			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
98			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
99				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
100					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
101						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
102							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
103	↔							↔		↔		Users perform messaging in the 1-to-many Chat (see clause 5.3.2.2 Chat 1 to many via MSRP - Roaming)
104A	→											User A leaves the 1-to-many Chat
105A		→									BYE	UE_A sends BYE to IMS_A to leave the 1-to-many Chat
106A			←								BYE	IMS_A forwards BYE to AS/IM_A
107A			→								BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
108A				→							BYE	IMS_A forwards BYE to IBCF_A
109A					→						BYE	IBCF_A forwards BYE to IBCF_B
110A						→					BYE	IBCF_B forwards BYE to IMS_B
111A							→				BYE	IMS_B forwards BYE to AS/IM_B
112A							←				200 OK	AS/IM_B sends 200 OK for BYE
113A						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
114A					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
115A				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
116A			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
117A			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
118A		←									200 OK	IMS_A forwards 200 OK response to UE_A

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
119A												User A is informed that he has left the 1-to-many Chat
120A											NOTIFY	AS/IM_B sends NOTIFY to IMS _B to inform UE_B that User A has left the 1-to-many Chat
121A											NOTIFY	IMS_B forwards NOTIFY to IBCF_B
122A											NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
123A											NOTIFY	IBCF_A forwards NOTIFY to IMS_A
124A											NOTIFY	IMS_A forwards NOTIFY to UE_B
125A												User B is notified that all other users have left the 1-to-many Chat
126A											200 OK	UE_B responds with 200 OK to IMS_A
127A											200 OK	IMS_A forwards 200 OK response to IBCF_A
128A											200 OK	IBCF_A forwards 200 OK response to IBCF_B
129A											200 OK	IBCF_B forwards 200 OK response to IMS_B
130A											200 OK	IMS_B forwards 200 OK response to AS/IM_B
131A												User B leaves the 1-to-many Chat
132A											BYE	UE_B sends BYE to IMS_A to leave the 1-to-many Chat
133A											BYE	IMS_A forwards BYE to IBCF_A
134A											BYE	IBCF_A forwards BYE to IBCF_B
135A											BYE	IBCF_B forwards BYE to IMS_B
136A											BYE	IMS_B forwards BYE to AS/IM_B
137A											200 OK	AS/IM_B sends 200 OK for BYE
138A											200 OK	IMS_B forwards 200 OK response to IBCF_B
139A											200 OK	IBCF_B forwards 200 OK response to IBCF_A
140A											200 OK	IBCF_A forwards 200 OK response to IMS_A
141A											200 OK	IMS_A forwards 200 OK response to UE_B
142A												User B is informed that the 1-to-many Chat has ended
104B												User B leaves the 1-to-many Chat
105B											BYE	UE_B sends BYE to IMS_A to leave the 1-to-many Chat
106B											BYE	IMS_A forwards BYE to IBCF_A
107B											BYE	IBCF_A forwards BYE to IBCF_B
108B											BYE	IBCF_B forwards BYE to IMS_B
109B											BYE	IMS_B forwards BYE to AS/IM_B
110B											200 OK	AS/IM_B sends 200 OK for BYE
111B											200 OK	IMS_B forwards 200 OK response to IBCF_B
112B											200 OK	IBCF_B forwards 200 OK response to IBCF_A
113B											200 OK	IBCF_A forwards 200 OK response to IMS_A
114B											200 OK	IMS_A forwards 200 OK response to UE_B



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
115B									⟶			User B is informed that he has left the 1-to-many Chat
116B							⟵				NOTIFY	AS/IM_B sends NOTIFY to IMS_B to inform UE_A that User B has left the 1-to-many Chat
117B						⟵					NOTIFY	IMS_B forwards NOTIFY to IBCF_B
118B					⟵						NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
119B				⟵							NOTIFY	IBCF_A forwards NOTIFY to IMS_A
120B			⟵								NOTIFY	IMS_A forwards NOTIFY to AS/IM_A
121B			⟶								NOTIFY	AS/IM_A returns, possibly modified, NOTIFY to IMS_A
122B		⟵									BYE	IMS_A forwards NOTIFY to UE_A
123B	⟵											User A is informed that User B has left the 1-to-many Chat
124B		⟶		⟶							200 OK	UE_A sends 200 OK for NOTIFY
125B			⟵								200 OK	IMS_A forwards 200 OK response to AS/IM_A
126B			⟶								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
127B				⟶							200 OK	IMS_A forwards 200 OK response to IBCF_A
128B					⟶						200 OK	IBCF_A forwards 200 OK response to IBCF_B
129B						⟶					200 OK	IBCF_B forwards 200 OK response to IMS_B
130B							⟶				200 OK	IMS_B forwards 200 OK response to AS/IM_B
131B	⟶											User A leaves the 1-to-many Chat
132B		⟶		⟶							BYE	UE_A sends BYE to IMS_A to leave the 1-to-many Chat
133B			⟵								BYE	IMS_A forwards BYE to AS/IM_A
134B			⟶								BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
135B				⟶							BYE	IMS_A forwards BYE to IBCF_A
136B					⟶						BYE	IBCF_A forwards BYE to IBCF_B
137B						⟶					BYE	IBCF_B forwards BYE to IMS_B
138B							⟶				BYE	IMS_B forwards BYE to AS/IM_B
139B							⟵				200 OK	AS/IM_B sends 200 OK for BYE
140B						⟵					200 OK	IMS_B forwards 200 OK response to IBCF_B
141B					⟵						200 OK	IBCF_B forwards 200 OK response to IBCF_A
142B				⟵							200 OK	IBCF_A forwards 200 OK response to IMS_A
143B			⟵								200 OK	IMS_A forwards 200 OK response to AS/IM_A
144B			⟶								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
145B		⟵									200 OK	IMS_A forwards 200 OK response to UE_A
146B	⟵											User A is informed that the 1-to-many Chat has ended

4.5.3.7 Adding participants to an already established 1-to-many chat session

4.5.3.7.1 Adding participants to an already established 1-to-many chat session - interworking

Interoperability Test Description		
Identifier:	TD_IMS_CHAT_0015	
Summary:	IMS network supports 1-to-many IM/Chat service and messages exchange between two users in their network can be performed. User A invites User D to an already established 1-to-many Chat	
Configuration:	CF_INT_AS	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5107_01	TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 6th numbered list)
	TD_MSRP_CHAT_0002	RFC 4975 [8], clauses 5.4, 7.1 and 7.2 RFC 5547 [11]
Use Case ref.:	UC_RCS_6_I & UC_MSRP_02	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A, UE_C, UE_D and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B, UE_D and UE_C are registered in IMS_B optionally using userPRES according to table 1 • UE_A, UE_B and UE_C shall support MSRP • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A, UE_C, UE_D and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User A initiates a 1-to-many Chat with User B and User C by sending initial message
	2	User A is informed that the 1-to-many Chat is established
	3	User B is informed of incoming invitation from User A to join the 1-to-many Chat
	4	User B reads the initial message and accepts the 1-to-many Chat invitation
	5	User A is notified with list of 1-to-many Chat participants
	6	User B is notified with list of 1-to-many Chat participants
	7	Users perform messaging in the 1-to-many Chat
	8	User A invites User D to join 1-to-many Chat
	9	User D is informed of incoming invitation from User A to join the 1-to-many Chat
	10	User D accepts the 1-to-many Chat invitation
	11	User A is notified with list of 1-to-many Chat participants
	12	User D is notified with list of 1-to-many Chat participants
	13	Users perform messaging in the 1-to-many Chat
	14	User D leaves the 1-to-many Chat
	15	User D is informed that he has left the 1-to-many Chat
	16	User A is notified that User D has left the 1-to-many Chat
	17A	User B leaves the 1-to-many Chat
	17B	User A leaves the 1-to-many Chat
	18A	User B is informed that he has left the 1-to-many Chat
	18B	User A is informed that he has left the 1-to-many Chat
	19A	User A is notified that all other users have left the 1-to-many Chat
	19B	User B is notified that all other users have left the 1-to-many Chat
	20A	User A leaves the 1-to-many Chat
	20B	User B leaves the 1-to-many Chat
	20A	User A is informed that the 1-to-many Chat has ended

Interoperability Test Description		
	20B	User B is informed that the 1-to-many Chat has ended
Conformance Criteria:	**Check**	
	1	TP_IMS_5107_01 in CFW step 77 (BYE): *ensure that {* *when { UE_B sends BYE to AS_A }* *then { IMS_A receives the BYE* *not containing Route_header* *indicating the S-CSCF_SIP_URI of IMS_A* *}* *}*

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE D	User D		
1												Follow UC_RCS_6_I (1-79)
2		→										User A invites User D to join 1-to-many Chat
3			→	→							REFER	UE_A sends REFER message to IMS_A, with IM session identity (allocated for the current 1-to-many chat), Refer-To header value equals to UE_D URI and Refer-Sub header value set to "false"
4			←								REFER	IMS_A forwards REFER to AS/IM_A
5			→								200 OK	AS/IM_A responds with 200 OK to IMS_A
6		←									200 OK	IMS_A forwards the 200 OK response to UE_A
7			→	→							INVITE	AS/IM_A sends INVITE to UE_D with IM session identity (allocated for the current 1-to-many Chat) and IM address of the Inviting IM UE (UE_A)
8			←								100 Trying	IMS_A responds with a 100 Trying provisional response
9				→	→						INVITE	IMS_A forwards INVITE to IBCF_A
10				←							100 Trying	IBCF_A responds with a 100 Trying provisional response
11					→	→					INVITE	IBCF_A forwards INVITE to IBCF_B
12					←						100 Trying	IBCF_B responds with a 100 Trying provisional response
13						→	→				INVITE	IBCF_B forwards INVITE to IMS_B
14						←					100 Trying	IMS_B responds with a 100 Trying provisional response
15							→	→			INVITE	IMS_B forwards INVITE to AS/IM_B
16							←				100 Trying	AS/IM_B responds with a 100 Trying provisional response
17							←				INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
18							→	→			100 Trying	IMS_B responds with a 100 Trying provisional response
19								→	→		INVITE	IMS_B forwards INVITE to UE_D
20								←			100 Trying	UE_D optionally responds with a 100 Trying provisional response

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE D	User D		
21									→			User D is informed of incoming invitation from User A to join the 1-to-many Chat
22									←			User D accepts the 1-to-many Chat invitation
23							←				200 OK	UE_D responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform AS/IM_A with specific data for MSRP connection set up
24							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
25							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
26						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
27					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
28				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
29			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
30			→								ACK	AS/IM_A acknowledges the receipt of 200 OK for INVITE
31				→							ACK	IMS_A forwards ACK to IBCF_A
32					→						ACK	IBCF_A forwards ACK to IBCF_B
33						→					ACK	IBCF_B forwards ACK to IMS_B
34							→				ACK	IMS_B forwards ACK to AS/IM_B
35							←				ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
36							→				ACK	IMS_B forwards ACK to UE_D
37			→								NOTIFY	AS/IM_A sends NOTIFY to UE_A with list of 1-to-many Chat participants
38		←									NOTIFY	IMS_A forwards the NOTIFY to UE_A
39	←											User A is notified with list of 1-to-many Chat participants
40		→									200 OK	UE_A responds with 200 OK to IMS_A
41			←								200 OK	IMS_A forwards the 200 OK response to AS/IM_A
42							←				SUBSCRIBE	UE_D subscribes to the conference event package
43							→				SUBSCRIBE	IMS_B forwards SUBSCRIBE to AS/IM_B
44							←				SUBSCRIBE	AS/IM_B returns, possibly modified, SUBSCRIBE to IMS_B
45						←					SUBSCRIBE	IMS_B forwards SUBSCRIBE to IBCF_B
46					←						SUBSCRIBE	IBCF_B forwards SUBSCRIBE to IBCF_A
47				←							SUBSCRIBE	IBCF_A forwards SUBSCRIBE to IMS_A
48			←								SUBSCRIBE	IMS_A forwards SUBSCRIBE to AS/IM_A
49			→								200 OK	AS/IM_A sends 200 OK for SUBSCRIBE

Step	Direction										Message	Comment
	User A	UEA	AS/IMA	IMSA	IBCFA	IBCFB	IMSB	AS/IMB	UED	User D		
50				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
51					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
52						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
53							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
54							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
55							→		→		200 OK	IMS_B forwards 200 OK response to UE_D
56			←								NOTIFY	AS/IM_A sends NOTIFY to UE_D with list of 1-to-many Chat participants
57				→							NOTIFY	IMS_A forwards BYE to IBCF_A
58					→						NOTIFY	IBCF_A forwards BYE to IBCF_B
59						→					NOTIFY	IBCF_B forwards BYE to IMS_B
60							→				NOTIFY	IMS_B forwards BYE to AS/IM_B
61							←				NOTIFY	AS/IM_B returns, possibly modified, BYE to IMS_B
62							→		→		NOTIFY	IMS_B forwards BYE to UE_D
63									→			User D is notified with list of 1-to-many Chat participants
64							←		←		200 OK	UE_D sends 200 OK for NOTIFY
65							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
66							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
67						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
68					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
69				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
70			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
71	←		→							→		Users perform messaging in the 1-to-many Chat (see clause 5.3.2.3Chat 1 to many via MSRP to additional user - Interworking - CheckMSRP3)
72									←			User D leaves the 1-to-many Chat
73							←		←		BYE	UE_D sends BYE to IMS_B to leave the 1-to-many Chat
74							→				BYE	IMS_B forwards BYE to AS/IM_B
75							←				BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
76						←					BYE	IMS_B forwards BYE to IBCF_B
77					←						BYE	IBCF_B forwards BYE to IBCF_A
78				←							BYE	IBCF_A forwards BYE to IMS_A
79			←								BYE	IMS_A forwards BYE to AS/IM_A
80			→								200 OK	AS/IM_A sends 200 OK for BYE
81				→							200 OK	IMS_A forwards 200 OK response to IBCF_A

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE D	User D		
82					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
83						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
84							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
85							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
86							→				200 OK	IMS_B forwards 200 OK response to UE_B
87									→			User D is informed that he has left the 1-to-many Chat
88			→								NOTIFY	AS/IM_A sends NOTIFY to IMS _A to inform UE_A that User B has left the 1-to-many Chat
89		←									NOTIFY	IMS_A forwards the NOTIFY to UE_A
90	←											User A is notified that User D has left the 1-to-many Chat
91		→									200 OK	UE_A responds with 200 OK to IMS_A
92			←								200 OK	IMS_A forwards the 200 OK response to AS/IM_A
93												Continue UC_RCS_6_I (80A-116B)

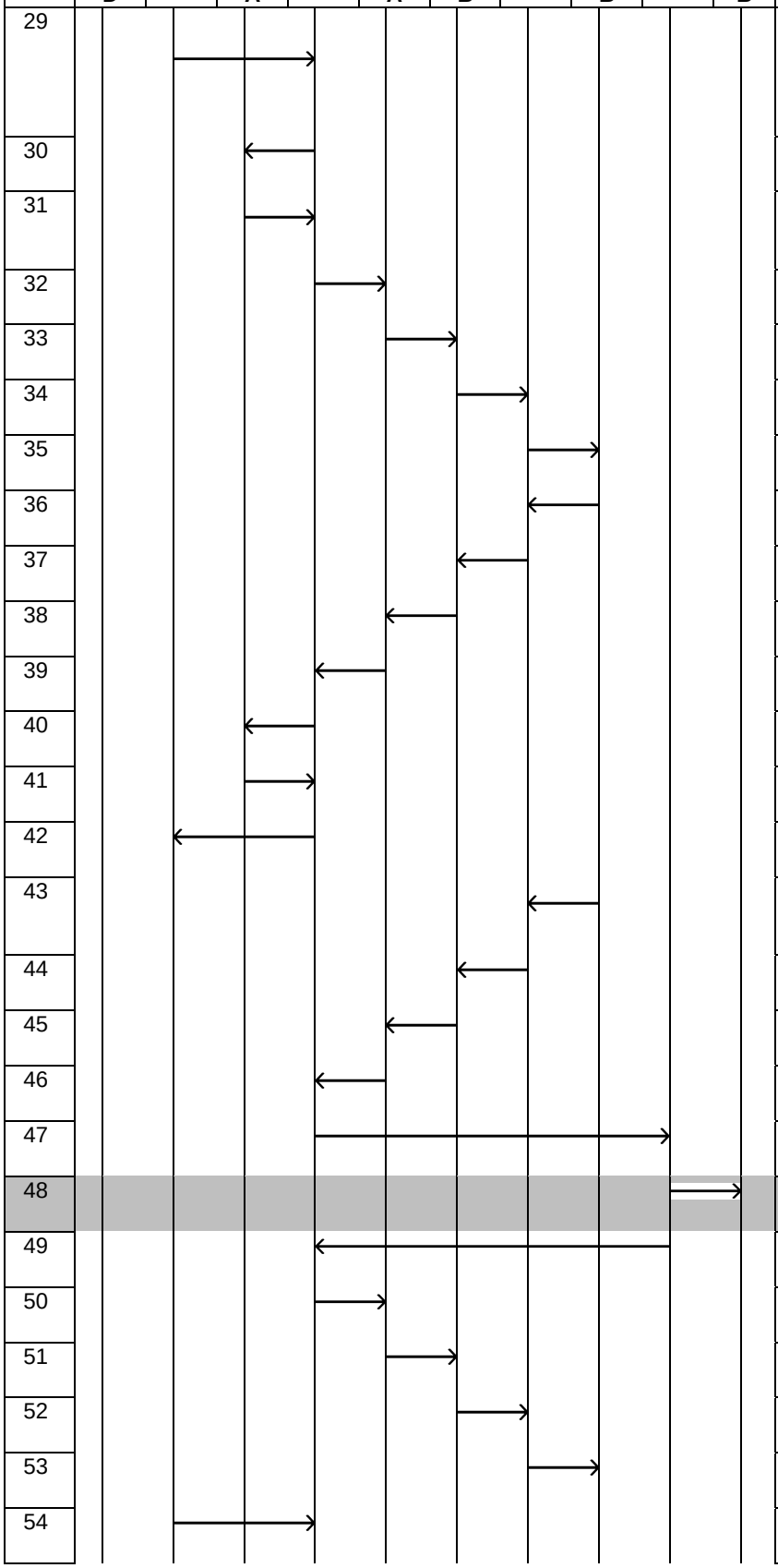
4.5.3.7.2 Adding participants to an already established 1-to-many chat session - roaming (optional)

Interoperability Test Description		
Identifier:	TD_IMS_CHAT_0016	
Summary:	IMS network supports 1-to-many IM/Chat service and messages exchange between two users, one user in its home network and one user roaming can be performed. User B invites User D to an already established 1-to-many Chat	
Configuration:	CF_ROAM_AS (OPTIONAL)	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5107_04	TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 8th numbered list)
	TP_IMS_5107_03	TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 6th numbered list)
Use Case ref.:	UC_RCS_6_R & UC_MSRP_04	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A, UE_C, UE_D and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A and UE_D are registered in IMS_A optionally using userPRES according to table 1 • UE_A, UE_B and UE_C shall support MSRP • UE_B and UE_C are registered in IMS_B via IMS_A optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A, UE_C, UE_D and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	

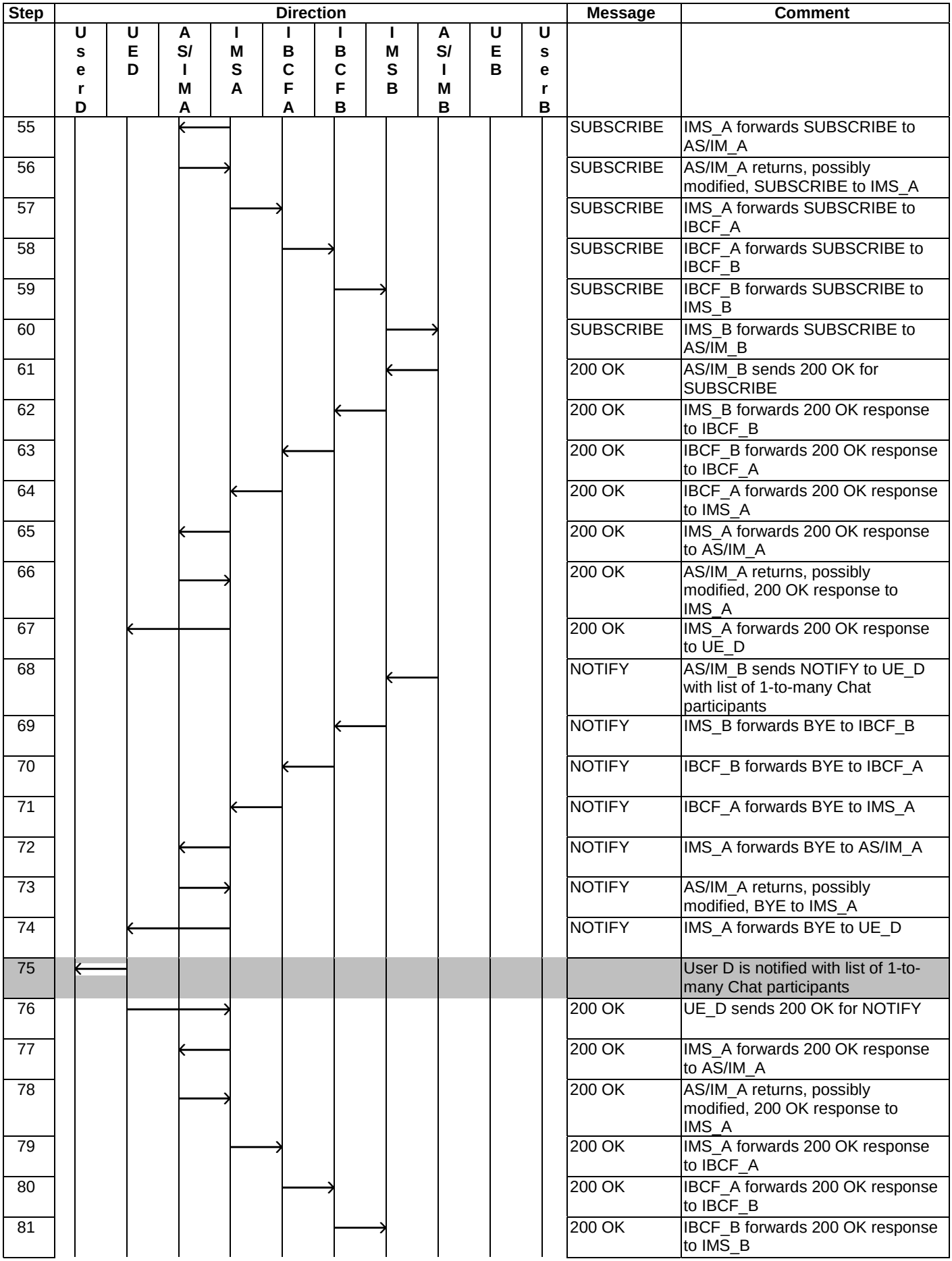
Interoperability Test Description		
Test Sequence:	**Step**	
	1	User B initiates a 1-to-many Chat with User A and User C by sending initial message
	2	User B is informed that the 1-to-many Chat is established
	3	User A is informed of incoming invitation from User B to join the 1-to-many Chat
	4	User A reads the initial message and accepts the 1-to-many Chat invitation
	5	User B is notified with list of 1-to-many Chat participants
	6	User A is notified with list of 1-to-many Chat participants
	7	Users perform messaging in the 1-to-many Chat
	8	User B invites User D to join 1-to-many Chat
	9	User D is informed of incoming invitation from User B to join the 1-to-many Chat
	10	User D reads the initial message and accepts the 1-to-many Chat invitation
	11	User B is notified with list of 1-to-many Chat participants
	12	User D is notified with list of 1-to-many Chat participants
	13	Users perform messaging in the 1-to-many Chat
	14	User D leaves the 1-to-many Chat
	15	User D is informed that he has left the 1-to-many Chat
	16	User B is notified that user D has left the 1-to-many Chat
	17A	User A leaves the 1-to-many Chat
	17B	User B leaves the 1-to-many Chat
	18A	User A is informed that he has left the 1-to-many Chat
	18B	User B is informed that he has left the 1-to-many Chat
	19A	User B is notified that all other users have left the 1-to-many Chat
	19B	User A is notified that all other users have left the 1-to-many Chat
	20A	User B leaves the 1-to-many Chat
	20B	User A leaves the 1-to-many Chat
	21A	User B is informed that the 1-to-many Chat has ended
	21B	User A is informed that the 1-to-many Chat has ended
Conformance Criteria:	**Check**	
	1	TP_IMS_5107_04 in CFW step 5 (REFER): *ensure that {* *when { UE_B sends REFER to AS_B }* *then { IMS_B receives the REFER* *not containing Route_header* *indicating the S-CSCF_SIP_URI of IMS_A* *}* *}*
	2	TP_IMS_5107_03 in CFW step 89 (BYE): *ensure that {* *when { UE_D sends BYE to AS_B }* *then { IMS_B receives the BYE* *not containing Route_header* *indicating the S-CSCF_SIP_URI of IMS_A* *}* *}*

Step	Direction										Message	Comment
	User D	UE D	AS/ IMA	IMS A	IBCF A	IBCF B	IMS B	AS/ IMB	UE B	User B		
1												Follow UC_RCS_6_R (1-103)
2									←			User B invites User D to join 1-to-many Chat
3				←							REFER	UE_B sends REFER message to IMS_A, with IM session identity (allocated for the current 1-to-many chat), Refer-To header value equals to UE_D URI and Refer-Sub header value set to "false"

Step	Direction										Message	Comment
	User D	UE D	AS/IMA	IMSA	IBCFA	IBCFB	IMSB	AS/IMB	UE B	User B		
4				→							REFER	IMS_A forwards REFER to IBCF_A
5					→						REFER	IBCF_A forwards REFER to IBCF_B
6						→					REFER	IBCF_B forwards REFER to IMS_B
7							→				REFER	IMS_B forwards REFER to AS/IM_B
8							←				200 OK	AS/IM_B responds with 200 OK to IMS_B
9						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
10					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
11				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
12									→		200 OK	IMS_A forwards 200 OK response to UE_B
13							←				INVITE	AS/IM_B sends INVITE to UE_D with IM session identity (allocated for the current 1-to-many Chat) and IM address of the Inviting IM UE (UE_D)
14							→				100 Trying	IMS_B responds with a 100 Trying provisional response
15						←					INVITE	IMS_B forwards INVITE to IBCF_B
16						→					100 Trying	IBCF_B responds with a 100 Trying provisional response
17					←						INVITE	IBCF_B forwards INVITE to IBCF_A
18					→						100 Trying	IBCF_A responds with a 100 Trying provisional response
19				←							INVITE	IBCF_A forwards INVITE to IMS_A
20				→							100 Trying	IMS_A responds with a 100 Trying provisional response
21			←								INVITE	IMS_A forwards INVITE to AS/IM_A
22			→								100 Trying	AS/IM_A responds with a 100 Trying provisional response
23			→								INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
24			←								100 Trying	IMS_A responds with a 100 Trying provisional response
25		←									INVITE	IMS_A forwards INVITE to UE_D
26		→									100 Trying	UE_D optionally responds with a 100 Trying provisional response
27	←											User D is informed of incoming invitation from User B to join the 1-to-many Chat
28	→											User D reads the initial message and accepts the 1-to-many Chat invitation



Step	Message	Comment
29	200 OK	UE_D responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform AS/IM_A with specific data for MSRP connection set up
30	200 OK	IMS_A forwards 200 OK response to AS/IM_A
31	200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
32	200 OK	IMS_A forwards 200 OK response to IBCF_A
33	200 OK	IBCF_A forwards 200 OK response to IBCF_B
34	200 OK	IBCF_B forwards 200 OK response to IMS_B
35	200 OK	IMS_B forwards 200 OK response to AS/IM_B
36	ACK	AS/IM_B acknowledges the receipt of 200 OK for INVITE
37	ACK	IMS_B forwards ACK to IBCF_B
38	ACK	IBCF_B forwards ACK to IBCF_A
39	ACK	IBCF_A forwards ACK to IMS_A
40	ACK	IMS_A forwards ACK to AS/IM_A
41	ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
42	ACK	IMS_A forwards ACK to UE_D
43	NOTIFY	AS/IM_B sends NOTIFY to UE_B with list of 1-to-many Chat participants
44	NOTIFY	IMS_B forwards NOTIFY to IBCF_B
45	NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
46	NOTIFY	IBCF_A forwards NOTIFY to IMS_A
47	NOTIFY	IMS_A forwards NOTIFY to UE_B
48		User B is notified with list of 1-to-many Chat participants
49	200 OK	UE_B responds with 200 OK to IMS_A
50	200 OK	IMS_A forwards 200 OK response to IBCF_A
51	200 OK	IBCF_A forwards 200 OK response to IBCF_B
52	200 OK	IBCF_B forwards 200 OK response to IMS_B
53	200 OK	IMS_B forwards 200 OK response to AS/IM_B
54	SUBSCRIBE	UE_D subscribes to the conference event package


Step
Direction
User D
UE D
AS/IM A
IMS A
IBCF A
IBCF B
IMS B
AS/IM B
UE B
User B
Message
Comment
55 SUBSCRIBE IMS_A forwards SUBSCRIBE to AS/IM_A
56 SUBSCRIBE AS/IM_A returns, possibly modified, SUBSCRIBE to IMS_A
57 SUBSCRIBE IMS_A forwards SUBSCRIBE to IBCF_A
58 SUBSCRIBE IBCF_A forwards SUBSCRIBE to IBCF_B
59 SUBSCRIBE IBCF_B forwards SUBSCRIBE to IMS_B
60 SUBSCRIBE IMS_B forwards SUBSCRIBE to AS/IM_B
61 200 OK AS/IM_B sends 200 OK for SUBSCRIBE
62 200 OK IMS_B forwards 200 OK response to IBCF_B
63 200 OK IBCF_B forwards 200 OK response to IBCF_A
64 200 OK IBCF_A forwards 200 OK response to IMS_A
65 200 OK IMS_A forwards 200 OK response to AS/IM_A
66 200 OK AS/IM_A returns, possibly modified, 200 OK response to IMS_A
67 200 OK IMS_A forwards 200 OK response to UE_D
68 NOTIFY AS/IM_B sends NOTIFY to UE_D with list of 1-to-many Chat participants
69 NOTIFY IMS_B forwards BYE to IBCF_B
70 NOTIFY IBCF_B forwards BYE to IBCF_A
71 NOTIFY IBCF_A forwards BYE to IMS_A
72 NOTIFY IMS_A forwards BYE to AS/IM_A
73 NOTIFY AS/IM_A returns, possibly modified, BYE to IMS_A
74 NOTIFY IMS_A forwards BYE to UE_D
75 User D is notified with list of 1-to-many Chat participants
76 200 OK UE_D sends 200 OK for NOTIFY
77 200 OK IMS_A forwards 200 OK response to AS/IM_A
78 200 OK AS/IM_A returns, possibly modified, 200 OK response to IMS_A
79 200 OK IMS_A forwards 200 OK response to IBCF_A
80 200 OK IBCF_A forwards 200 OK response to IBCF_B
81 200 OK IBCF_B forwards 200 OK response to IMS_B

Step	Direction										Message	Comment
	User D	UE D	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
82							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
83	↔						↔	↔		↔		Users perform messaging in the 1-to-many Chat (see clause 5.3.2.4 Chat 1 to many via MSRP to additional user - Roaming)
84	→											User D leaves the 1-to-many Chat
85		→		→							BYE	UE_D sends BYE to IMS_A to leave the 1-to-many Chat
86			←	←							BYE	IMS_A forwards BYE to AS/IM_A
87			→	→							BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
88				→	→						BYE	IMS_A forwards BYE to IBCF_A
89					→	→					BYE	IBCF_A forwards BYE to IBCF_B
90						→	→				BYE	IBCF_B forwards BYE to IMS_B
91							→	→			BYE	IMS_B forwards BYE to AS/IM_B
92							←	←			200 OK	AS/IM_B sends 200 OK for BYE
93						←	←				200 OK	IMS_B forwards 200 OK response to IBCF_B
94					←	←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
95				←	←						200 OK	IBCF_A forwards 200 OK response to IMS_A
96			←	←							200 OK	IMS_A forwards 200 OK response to AS/IM_A
97			→	→							200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
98		←		←							200 OK	IMS_A forwards 200 OK response to UE_D
99	←											User D is informed that he has left the 1-to-many Chat
100							←	←			NOTIFY	AS/IM_B sends NOTIFY to IMS _B to inform UE_B that User D has left the 1-to-many Chat
101						←	←				NOTIFY	IMS_B forwards NOTIFY to IBCF_B
102					←	←					NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
103				←	←						NOTIFY	IBCF_A forwards NOTIFY to IMS_A
104				→				→	→		NOTIFY	IMS_A forwards NOTIFY to UE_B
105									→	→		User B is notified that user D has left the 1-to-many Chat
106				←					←		200 OK	UE_B responds with 200 OK to IMS_A
107				→	→						200 OK	IMS_A forwards 200 OK response to IBCF_A
108					→	→					200 OK	IBCF_A forwards 200 OK response to IBCF_B

Step	Direction										Message	Comment
	User D	UE D	AS/IMA	IMSA	IBCFA	IBCFB	IMSB	AS/IMB	UEB	User B		
109							→				200 OK	IBCF_B forwards 200 OK response to IMS_B
110								→			200 OK	IMS_B forwards 200 OK response to AS/IM_B
111												Continue UC_RCS_6_R (104A-146B)

4.5.4 RCS services during a call

4.5.4.1 Video sharing

4.5.4.1.1 Video sharing- interworking

Interoperability Test Description		
Identifier:	TD_IMS_SHARE_0001	
Summary:	IMS network supports Video sharing service and messages exchange between two users in their networks can be performed. User A starts video sharing with User B during a voice call	
Configuration:	CF_INT_AS	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5097_01	TS 124 229 [1], clause 5.4.3.2 ¶11 (1st numbered list)
	TP_IMS_5115_08	TS 124 229 [1], clause 5.4.3.3 ¶89 (3rd numbered list)
Use Case ref.:	UC_RCS_8_I	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1A	User A establishes voice call with user B
	1B	User B establishes voice call with user A
	2	User A requests to share video with user B
	3	User B is requested to accept to share video
	4	User B accepts to share video with user A
	5	User A is informed that request has been answered
	6	Video sharing starts
	7A	User A ends video sharing
	8A	User B is informed that video sharing has terminated
	9A	User A is informed that video sharing has terminated
	10A	User A initiates voice call termination
	7B	User B ends video sharing
	8B	User A is informed that video sharing has terminated
	9B	User B is informed that video sharing has terminated
	10B	User B initiates voice call termination

Interoperability Test Description		
Conformance Criteria:	**Check**	
	1	TP_IMS_5097_01 in CFW step 7 (INVITE): *ensure that {* *when { UE_A sends an initial INVITE to UE_B }* *then { IMS_B receives the initial INVITE* *not containing a Route_header* *indicating the S-CSCF_SIP_URI of IMS_A* *containing a P-Charging-Vector_header* *(containing an icid-value_parameter and* *containing a orig-ioi_parameter indicating IMS_A and* *not containing an access-network-charging-info_parameter and* *not containing a term-ioi_parameter) and* *containing a Record-Route_header* *indicating the originating S-CSCF_SIP_URI }* *}*
	2	TP_IMS_5115_08 in CFW step 22 (200 OK) *ensure that {* *when { IMS_B receives 200_response from UE_B addressed_to UE_A }* *then { IMS_B sends the 200_response to IMS_A* *containing a P-Charging-Vector_header* *including a orig-ioi_parameter* *indicating operator_identifier of IMS_A and* *including a term-ioi_parameter* *indicating operator_identifier of IMS_BIUT_ }* *}*

NOTE: After step 31 in the below message sequence chart the quality assessment test description as described in clause 4.2.1 of TS 103 189 [19] can be applied.

Step	Direction								Message	Comment
	User A	UEA	IMSA	IBCFA	IBCFB	IMSB	UEB	User B		
1A	←	—	—	—	—	—	—	→		User A establishes a voice call to user B
1B	←	—	—	—	—	—	—	→		User B establishes a voice call to user A
2	→									User A requests to share video with user B
3		→							INVITE	UE_A sends INVITE to share video with user B
4		←							100 Trying	IMS_A responds with a 100 Trying provisional response
5			→						INVITE	IMS_A forwards INVITE to IBCF_A
6			←						100 Trying	IBCF_A responds with a 100 Trying provisional response
7				→					INVITE	IBCF_A forwards INVITE to IBCF_B
8				←					100 Trying	IBCF_B responds with a 100 Trying provisional response
9					→				INVITE	IBCF_B forwards INVITE to IMS_B
10					←				100 Trying	IMS_B responds with a 100 Trying provisional response
11						→			INVITE	IMS_B forwards INVITE to UE_B
12						←			100 Trying	UE_B responds with a 100 Trying provisional response
13							→			User B is requested to accept to share video (optional)
14						←			180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting (optional)
15					←				180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B (optional)
16				←					180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A (optional)

Step	Direction								Message	Comment
	User A	UE A	IMS A	IBCF A	IBCF B	IMS B	UE B	User B		
17			←						180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A (optional)
18		←							180 Ringing	IMS_A forwards the 180 Ringing response to UE_A (optional)
19							←			User B accepts to share video
20						←			200 OK	UE_B responds INVITE with 200 OK to indicate that the request has been accepted
21					←				200 OK	IMS_B forwards 200 OK response to IBCF_B
22				←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
23			←						200 OK	IBCF_A forwards 200 OK response to IMS_A
24		←							200 OK	IMS_A forwards 200 OK response to UE_A
25	←									User A is informed that request has been answered
26		→							ACK	UE_A acknowledges the receipt of 200 OK for INVITE
27			→						ACK	IMS_A forwards ACK to IBCF_A
28				→					ACK	IBCF_A forwards ACK to IBCF_B
29					→				ACK	IBCF_B forwards ACK to IMS_B
30						→			ACK	IMS_B forwards ACK to UE_B
31	→		→	→	→	→	→	→		Video sharing starts
32A	→									User A ends video sharing
33A		→							BYE	UE_A releases the call with BYE
34A			→						BYE	IMS_A forwards BYE to IBCF_A
35A				→					BYE	IBCF_A forwards BYE to IBCF_B
36A					→				BYE	IBCF_B forwards BYE to IMS_B
37A						→			BYE	IMS_B forwards BYE to UE_B
38A							→			User B is informed that video sharing has ended
39A						←			200 OK	UE_B sends 200 OK for BYE
40A					←				200 OK	IMS_B forwards 200 OK response to IBCF_B
41A				←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
42A			←						200 OK	IBCF_A forwards 200 OK response to IMS_A
43A		←							200 OK	IMS_A forwards the 200 OK response to UE_A
44A										User A is informed that video sharing has ended
45A						←			OPTIONS	UE_B sends OPTIONS to IMS_B to verify availability of video sharing capability of the UE_A
46A					←				OPTIONS	IMS_B forwards OPTIONS to IBCF_B
47A				←					OPTIONS	IBCF_B forwards OPTIONS to IBCF_A
48A			←						OPTIONS	IBCF_A forwards OPTIONS to IMS_A
49A		←							OPTIONS	IMS_A forwards OPTIONS to UE_A
50A		→							200 OK	UE_A responds 200 OK to IMS_A with updated capabilities
51A			→						200 OK	IMS_A forwards 200 OK to IBCF_A
52A				→					200 OK	IBCF_A forwards 200 OK to IBCF_B
53A					→				200 OK	IBCF_B forwards 200 OK to IMS_B
54A						→			200 OK	IMS_B forwards 200 OK to UE_B
55A	←		→	→	→	→	→	→		Voice call termination initiated by user A
32B							←			User B ends video sharing
33B						←			BYE	UE_B releases the call with BYE
34B					←				BYE	IMS_B forwards BYE to IBCF_B
35B				←					BYE	IBCF_B forwards BYE to IBCF_A
36B			←						BYE	IBCF_A forwards BYE to IMS_A
37B		←							BYE	IMS_A forwards BYE to UE_A
38B	←									User A is informed that video sharing has ended

Step	Direction								Message	Comment
	User A	UEA	IMSA	IBCFA	IBCFB	IMSB	UEB	User B		
39B			→						200 OK	UE_A sends 200 OK for BYE
40B				→					200 OK	IMS_A forwards 200 OK response to IBCF_A
41B					→				200 OK	IBCF_A forwards 200 OK response to IBCF_B
42B						→			200 OK	IBCF_B forwards 200 OK response to IMS_B
43B							→		200 OK	IMS_B forwards the 200 OK response to UE_B
44B								→		User B is informed that video sharing has ended
45B			→						OPTIONS	UE_A sends OPTIONS to IMS_A to verify availability of video sharing capability of the UE_B
46B				→					OPTIONS	IMS_A forwards OPTIONS to IBCF_A
47B					→				OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
48B						→			OPTIONS	IBCF_B forwards OPTIONS to IMS_B
49B							→		OPTIONS	IMS_B forwards OPTIONS to UE_B
50B							←		200 OK	UE_B responds with 200 OK to IMS_B with updated capabilities
51B						←			200 OK	IMS_B forwards 200 OK to IBCF_B
52B					←				200 OK	IBCF_B forwards 200 OK to IBCF_A
53B				←					200 OK	IBCF_A forwards 200 OK to IMS_A
54B			←						200 OK	IMS_A forwards 200 OK to UE_A
55B										Voice call termination initiated by user B

4.5.4.1.2 Video sharing- roaming (optional)

Interoperability Test Description		
Identifier:	TD_IMS_SHARE_0002	
Summary:	IMS network supports Video sharing service and messages exchange between two users, one user in its home network and one user roaming can be performed. User A starts video sharing with User B during a voice call	
Configuration:	CF_ROAM_AS (OPTIONAL)	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5046_01	TS 124 229 [1], clause 5.2.6.3.3 ¶1 (1st numbered list)
	TP_IMS_5067_01	TS 124 229 [1], clause 5.2.7.2 ¶5
Use Case ref.:	UC_RCS_8_R	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B via IMS_A optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1A	User A establishes voice call with user B
	1B	User B establishes voice call with user A
	2	User A requests to share video with user B
	3	User B is requested to accept to share video
	4	User B accepts to share video with user A
	5	User A is informed that request has been answered

Interoperability Test Description		
	6	Video sharing starts
	7A	User A ends video sharing
	8A	User B is informed that video sharing has terminated
	9A	User A is informed that video sharing has terminated
	10A	User A initiates voice call termination
	7B	User B ends video sharing
	8B	User A is informed that video sharing has terminated
	9B	User B is informed that video sharing has terminated
	10B	User B initiates voice call termination
Conformance Criteria:	**Check**	
	1	TP_IMS_5046_01 in CFW step 7 (INVITE) *ensure that {* *when { IMS_A receives an initial INVITE from UE_B }* *then { IMS_A sends the INVITE to IMS_B* *containing a Route_header* *not indicating the P-CSCF_SIP_URI of IMS_A and* *containing a Route_header* *indicating the "list of Service Route header URIs* *from the registration" and* *containing an additional Via_header* *containing (the P-CSCF_via_port_number and* *(the P-CSCF-FQDN_address or* *the P-CSCF-IP_address)) of IMS_A and* *containing an additional topmost Record-Route_header* *indicating (the P-CSCF_port_number* *'where it awaits subsequent requests' from UE_A and* *(the P-CSCF-FQDN_address or* *the P-CSCF-IP_address)) of IMS_A and* *not containing P-Preferred-Identity_header and* *containing a P-Asserted-Identity_header* *containing an address of UE_B and* *containing a P-Charging-Vector_header* *containing an icid-value_parameter }* *}*

	2	TP_IMS_5067_01 in CFW step 7 (INVITE)
		ensure that {
		when { IMS_A receives an initial INVITE from UE_B }
		then { IMS_A sends the INVITE to IMS_B
		containing a P-Charging-Vector_header
		}
		}

NOTE: After step 46 in the below message sequence chart the quality assessment test description as described in clause 4.2.2 of TS 103 189 [19] can be applied.

Step	Direction	Message	Comment
	User A / **UE A** / **IMS A** / **IBCF A** / **IBCF B** / **IMS B** / **UE B** / **User B**		
1A	⟵		User A sets up a voice call to user B
1B	⟵		User B sets up a voice call to user A
2	⟶		User A requests to share video with user B
3	⟶	INVITE	UE_A sends INVITE to share video with user B
4	⟵	100 Trying	IMS_A responds with a 100 Trying provisional response
5	⟶	INVITE	IMS_A forwards INVITE to IBCF_A
6	⟵	100 Trying	IBCF_A responds with a 100 Trying provisional response
7	⟶	INVITE	IBCF_A forwards INVITE to IBCF_B

Step	Direction								Message	Comment
	User A	UEA	IMSA	IBCFA	IBCFB	IMSB	UEB	User B		
8				←					100 Trying	IBCF_B responds with a 100 Trying provisional response
9					→				INVITE	IBCF_B forwards INVITE to IMS_B
10					←				100 Trying	IMS_B responds with a 100 Trying provisional response
11					←				INVITE	IMS_B forwards INVITE to IBCF_B
12					→				100 Trying	IBCF_B responds with a 100 Trying provisional response
13				←					INVITE	IBCF_B forwards INVITE to IBCF_A
14				→					100 Trying	IBCF_A responds with a 100 Trying provisional response
15			←						INVITE	IBCF_A forwards INVITE to IMS_A
16			→						100 Trying	IMS_A responds with a 100 Trying provisional response
17			—	—	—	—	→		INVITE	IMS_A forwards INVITE to UE_B
18			←	—	—	—	—		100 Trying	UE_B responds with a 100 Trying provisional response
19							→			User B is requested to accept to share video (optional)
20			←	—	—	—	—		180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting (optional)
21			→						180 Ringing	IMS_A forwards 180 Ringing response to IBCF_A (optional)
22				→					180 Ringing	IBCF_A forwards 180 Ringing response to IBCF_B (optional)
23					→				180 Ringing	IBCF_B forwards 180 Ringing response to IMS_B (optional)
24					←				180 Ringing	IMS_B forwards the 180 Ringing response to IBCF_B (optional)
25				←					180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A (optional)
26			←						180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A (optional)
27		←							180 Ringing	IMS_A forwards 180 Ringing response to UE_A (optional)
28							←			User B accepts to share video
29			←	—	—	—	—		200 OK	UE_B responds INVITE with 200 OK to indicate that the request has been accepted
30			→						200 OK	IMS_A forwards 200 OK response to IBCF_A
31				→					200 OK	IBCF_A forwards 200 OK response to IBCF_B
32					→				200 OK	IBCF_B forwards 200 OK response to IMS_B
33					←				200 OK	IMS_B forwards 200 OK response to IBCF_B
34				←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
35			←						200 OK	IBCF_A forwards 200 OK response to IMS_A
36		←								IMS_A forwards 200 OK response to UE_A
37	←									User A is informed that request has been answered
38		→							ACK	UE_A acknowledges the receipt of 200 OK for INVITE
39			→						ACK	IMS_A forwards ACK to IBCF_A
40				→					ACK	IBCF_A forwards ACK to IBCF_B
41					→				ACK	IBCF_B forwards ACK to IMS_B
42					←				ACK	IMS_B forwards ACK to IBCF_B
43				←					ACK	IBCF_B forwards ACK to IBCF_A
44			←						ACK	IBCF_A forwards ACK to IMS_A
45			—	—	—	—	→		ACK	IMS_A forwards ACK to UE_B
46	—	—	—	—	—	—	—	—		Video sharing starts

Step	Direction								Message	Comment
	User A	UE A	IMS A	IBCF A	IBCF B	IMS B	UE B	User B		
47A	←	←	←	←	←	←	←	←		User A ends video sharing
48A		→							BYE	UE_A releases the call with BYE
49A			→						BYE	IMS_A forwards BYE to IBCF_A
50A				→					BYE	IBCF_A forwards BYE to IBCF_B
51A					→				BYE	IBCF_B forwards BYE to IMS_B
52A					←				BYE	IMS_B forwards BYE to IBCF_B
53A				←					BYE	IBCF_B forwards BYE to IBCF_A
54A			←						BYE	IBCF_A forwards BYE to IMS_A
55A							→		BYE	IMS_A forwards BYE to UE_B
56A							→			User B is informed that video sharing has ended
57A			←						200 OK	UE_B sends 200 OK for BYE
58A			→						200 OK	IMS_A forwards 200 OK response to IBCF_A
59A				→					200 OK	IBCF_A forwards 200 OK response to IBCF_B
60A					→				200 OK	IBCF_B forwards 200 OK response to IMS_B
61A					←				200 OK	IMS_B forwards the 200 OK response to IBCF_B
62A				←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
63A			←						200 OK	IBCF_A forwards 200 OK response to IMS_A
64A		←							200 OK	IMS_A forwards the 200 OK response to UE_A
65A										Video sharing terminates
66A									OPTIONS	UE_B sends OPTIONS to IMS_A to verify availability of video sharing capability of the UE_A
67A			→						OPTIONS	IMS_A forwards OPTIONS to IBCF_A
68A				→					OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
69A					→				OPTIONS	IBCF_B forwards OPTIONS to IMS_B
70A					←				OPTIONS	IMS_B forwards OPTIONS to IBCF_B
71A				←					OPTIONS	IBCF_B forwards OPTIONS to IBCF_A
72A			←						OPTIONS	IBCF_A forwards OPTIONS to IMS_A
73A		←							OPTIONS	IMS_A forwards OPTIONS to UE_A
74A		→							200 OK	UE_A responds 200 OK to IMS_A with updated capabilities
75A			→						200 OK	IMS_A forwards 200 OK to IBCF_A
76A				→					200 OK	IBCF_A forwards 200 OK to IBCF_B
77A					→				200 OK	IBCF_B forwards 200 OK to IMS_B
78A					←				200 OK	IMS_B forwards 200 OK to IBCF_B
79A				←					200 OK	IBCF_B forwards 200 OK to IBCF_A
80A			←						200 OK	IBCF_A forwards 200 OK to IMS_A
81A							→		200 OK	IMS_A forwards 200 OK to UE_B
82A										User A terminates voice call
47B										User B ends video sharing
48B			←						BYE	UE_B releases the call with BYE
49B			→						BYE	IMS_A forwards BYE to IBCF_A
50B				→					BYE	IBCF_A forwards BYE to IBCF_B
51B					→				BYE	IBCF_B forwards BYE to IMS_B
52B					←				BYE	IMS_B forwards BYE to IBCF_B
53B				←					BYE	IBCF_B forwards BYE to IBCF_A
54B			←						BYE	IBCF_A forwards BYE to IMS_A
55B		←							BYE	IMS_A forwards BYE to UE_A
56B	←									User A is informed that video sharing has ended
57B		→							200 OK	UE_A sends 200 OK for BYE
58B			→						200 OK	IMS_A forwards 200 OK response to IBCF_A
59B				→					200 OK	IBCF_A forwards 200 OK response to IBCF_B
60B					→				200 OK	IBCF_B forwards 200 OK response to IMS_B
61B					←				200 OK	IMS_B forwards 200 OK response to IBCF_B

Step	Direction								Message	Comment
	User A	UEA	IMSA	IBCFA	IBCFB	IMSB	UEB	User B		
62B				←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
63B			←						200 OK	IBCF_A forwards 200 OK response to IMS_A
64B			→	→	→	→			200 OK	IMS_A forwards the 200 OK response to UE_B
65B	←	←	←	←	←	←	←	→		Video sharing terminates
66B		→							OPTIONS	UE_A sends OPTIONS to IMS_A to verify availability of video sharing capability of the UE_B
67B			→						OPTIONS	IMS_A forwards OPTIONS to IBCF_A
68B				→					OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
69B					→				OPTIONS	IBCF_B forwards OPTIONS to IMS_B
70B					←				OPTIONS	IMS_B forwards OPTIONS to IBCF_B
71B				←					OPTIONS	IBCF_B forwards OPTIONS to IBCF_A
72B			←						OPTIONS	IBCF_A forwards OPTIONS to IMS_A
73B			→	→	→	→			OPTIONS	IMS_A forwards OPTIONS to UE_B
74B			←						200 OK	UE_B responds with 200 OK to IMS_A with updated capabilities
75B			→						200 OK	IMS_A forwards 200 OK to IBCF_A
76B				→					200 OK	IBCF_A forwards 200 OK to IBCF_B
77B					→				200 OK	IBCF_B forwards 200 OK to IMS_B
78B					←				200 OK	IMS_B forwards 200 OK to IBCF_B
79B				←					200 OK	IBCF_B forwards 200 OK to IBCF_A
80B			←						200 OK	IBCF_A forwards 200 OK to IMS_A
81B		←							200 OK	IMS_A forwards 200 OK to UE_A
82B	←	←	←	←	←	←	←	→		User B terminates voice call

4.5.4.2 Video sharing rejection

4.5.4.2.1 Video sharing rejection - interworking

Interoperability Test Description		
Identifier:	TD_IMS_SHARE_0003	
Summary:	IMS network supports Video sharing service and messages exchange between two users in their networks can be performed. User A starts video sharing with User B during a voice call, but user B rejects the invitation	
Configuration:	CF_INT_AS	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5097_01	TS 124 229 [1], clause 5.4.3.2 ¶11 (1st numbered list)
Use Case ref.:	UC_RCS_8_I	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	

Interoperability Test Description		
Test Sequence:	**Step**	
	1	User A invites user B to 1-to-1 chat session
	2	User B automatically accepts 1-to-1 chat invitation
	3	Verify that Users perform chatting
	4	User A initiates an Ad-hoc IM conference with user B
	5	Verify that User A is informed that the Ad Hoc IM Conference is established
	6	Verify that User B is informed of incoming invitation from User A to join the Ad-hoc IM Conference
	7	User B joins the Ad-hoc IM Conference (automatically)
	8	Verify that User A is notified that User B has joined the Ad-hoc IM Conference
	9	Verify that User A informed that 1-to-1 chat session with user B has ended
	10	Verify that User B informed that 1-to-1 chat session with user A has ended
	11	Verify that Users perform IM/chat service in the Ad-hoc IM Conference
	12	User B leaves the Ad-hoc IM Conference
	13	Verify that User B is informed that the Ad-hoc IM Conference has ended
	14	Verify that User A is notified that user B has left the Ad-hoc IM Conference
	15	User A leaves the Ad-hoc IM Conference
	16	Verify that User A is informed that the Ad-hoc IM Conference has ended
Conformance Criteria:	**Check**	

	1	TP_IMS_5097_01 in CFW step 7 (INVITE):
		ensure that {
		when { UE_A sends an initial INVITE to UE_B }
		then { IMS_B receives the initial INVITE
		not containing a Route_header
		indicating the S-CSCF_SIP_URI of IMS_A
		containing a P-Charging-Vector_header
		(containing an icid-value_parameter and
		containing a orig-ioi_parameter indicating IMS_A and
		not containing an access-network-charging-info_parameter and
		not containing a term-ioi_parameter) and
		containing a Record-Route_header
		indicating the originating S-CSCF_SIP_URI }
		}

Step	Direction								Message	Comment
	User A	UE A	IMS A	IBCF A	IBCF B	IMS B	UE B	User B		
1A	←	←	←	←	←	←	←	←		User A establishes a voice call to user B
1B	←	←	←	←	←	←	←	←		User B establishes a voice call to user A
2		→								User A requests to share video with user B
3			→						INVITE	UE_A sends INVITE to share video with user B
4			←						100 Trying	IMS_A responds with a 100 Trying provisional response
5				→					INVITE	IMS_A forwards INVITE to IBCF_A
6				←					100 Trying	IBCF_A responds with a 100 Trying provisional response
7					→				INVITE	IBCF_A forwards INVITE to IBCF_B
8					←				100 Trying	IBCF_B responds with a 100 Trying provisional response
9						→			INVITE	IBCF_B forwards INVITE to IMS_B
10						←			100 Trying	IMS_B responds with a 100 Trying provisional response
11							→		INVITE	IMS_B forwards INVITE to UE_B
12							←		100 Trying	UE_B responds with a 100 Trying provisional response
13								→		User B is requested to accept to share picture (optional)

Step	Direction								Message	Comment
	User A	UEA	IMSA	IBCFA	IBCFB	IMSB	UEB	User B		
14									180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting (optional)
15									180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B (optional)
16									180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A (optional)
17									180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A (optional)
18									180 Ringing	IMS_A forwards the 180 Ringing response to UE_A (optional)
19										User B rejects to share picture
20									603 Decline	UE_B responds INVITE with 603 Decline to indicate that the request has been rejected
21									603 Decline	IMS_B forwards 603 Decline response to IBCF_B
22									603 Decline	IBCF_B forwards 603 Decline response to IBCF_A
23									603 Decline	IBCF_A forwards 603 Decline response to IMS_A
24									603 Decline	IMS_A forwards 603 Decline response to UE_A
25										User A is informed that request has been rejected
26									ACK	UE_A acknowledges the receipt of 603 Decline response for INVITE
27									ACK	IMS_A forwards ACK to IBCF_A
28									ACK	IBCF_A forwards ACK to IBCF_B
29									ACK	IBCF_B forwards ACK to IMS_B
30									ACK	IMS_B forwards ACK to UE_B
31A										Voice call termination initiated by user A
31B										Voice call termination initiated by user B

4.5.4.2.2 Video sharing rejection - roaming (optional)

Interoperability Test Description		
Identifier:	TD_IMS_SHARE_0004	
Summary:	IMS network supports Video sharing service and messages exchange between two users, one user in its home network and one user roaming can be performed. User A starts video sharing with User B during a voice call, but user B rejects the invitation	
Configuration:	CF_ROAM_AS (OPTIONAL)	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5070_01	TS 124 229 [1], clause 5.2.7.3 ¶3
Use Case ref.:	UC_RCS_8_R	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B via IMS_A optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	

Interoperability Test Description		
Test Sequence:	**Step**	
	1	User B invites user A to 1-to-1 chat session
	2	User A automatically accepts 1-to-1 chat invitation
	3	Verify that Users perform chatting
	4	User B initiates an Ad-hoc IM conference with user A
	5	Verify that User B is informed that the Ad Hoc IM Conference is established
	6	Verify that User A is informed of incoming invitation from User B to join the Ad-hoc IM Conference
	7	User A joins the Ad-hoc IM Conference (automatically)
	8	Verify that User B is notified that User A has joined the Ad-hoc IM Conference
	9	Verify that User B informed that 1-to-1 chat session with user A has ended
	10	Verify that User A informed that 1-to-1 chat session with user B has ended
	11	Verify that Users perform IM/chat service in the Ad-hoc IM Conference
	12	User A leaves the Ad-hoc IM Conference
	13	Verify that User A is informed that the Ad-hoc IM Conference has ended
	14	Verify that User B is notified that user A has left the Ad-hoc IM Conference
	15	User B leaves the Ad-hoc IM Conference
	16	Verify that User B is informed that the Ad-hoc IM Conference has ended
Conformance Criteria:	**Check**	
	1	TP_IMS_5070_01 in CFW step 8 (100 Trying) *ensure that {* *when { IMS_A receives an initial INVITE from IMS_B }* *then { IMS_A sends a 100_response to IMS_B* *}* *}*

Step	Direction								Message	Comment
	User A	UEA	IMSA	IBCFA	IBCFB	IMSB	UEB	User B		
1A	←	←	←	←	←	←	←	←		User A sets up a voice call to user B
1B	←	←	←	←	←	←	←	←		User B sets up a voice call to user A
2	→									User A requests to share video with user B
3		→	→						INVITE	UE_A sends INVITE to share video with user B
4		←	←						100 Trying	IMS_A responds with a 100 Trying provisional response
5			→	→					INVITE	IMS_A forwards INVITE to IBCF_A
6			←	←					100 Trying	IBCF_A responds with a 100 Trying provisional response
7				→	→				INVITE	IBCF_A forwards INVITE to IBCF_B
8				←	←				100 Trying	IBCF_B responds with a 100 Trying provisional response
9					→	→			INVITE	IBCF_B forwards INVITE to IMS_B
10					←	←			100 Trying	IMS_B responds with a 100 Trying provisional response
11					←	←			INVITE	IMS_B forwards INVITE to IBCF_B
12									100 Trying	IBCF_B responds with a 100 Trying provisional response
13				←	←				INVITE	IBCF_B forwards INVITE to IBCF_A

Step	Direction								Message	Comment
	User A	UEA	IMSA	IBCFA	IBCFB	IMSB	UEB	User B		
14				→					100 Trying	IBCF_A responds with a 100 Trying provisional response
15			←						INVITE	IBCF_A forwards INVITE to IMS_A
16			→						100 Trying	IMS_A responds with a 100 Trying provisional response
17						→			INVITE	IMS_A forwards INVITE to UE_B
18			←						100 Trying	UE_B responds with a 100 Trying provisional response
19							→			User B is requested to accept to share picture (optional)
20			←						180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting (optional)
21			→						180 Ringing	IMS_A forwards 180 Ringing response to IBCF_A (optional)
22				→					180 Ringing	IBCF_A forwards 180 Ringing response to IBCF_B (optional)
23					→				180 Ringing	IBCF_B forwards 180 Ringing response to IMS_B (optional)
24					←				180 Ringing	IMS_B forwards the 180 Ringing response to IBCF_B (optional)
25				←					180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A (optional)
26			←						180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A (optional)
27		←							180 Ringing	IMS_A forwards 180 Ringing response to UE_A (optional)
28							←			User B rejects to share picture
29			←						603 Decline	UE_B responds INVITE with 603 Decline to indicate that the request has been rejected
30			→						603 Decline	IMS_A forwards 603 Decline response to IBCF_A
31				→					603 Decline	IBCF_A forwards 603 Decline response to IBCF_B
32					→				603 Decline	IBCF_B forwards 603 Decline response to IMS_B
33					←				603 Decline	IMS_B forwards 603 Decline response to IBCF_B
34				←					603 Decline	IBCF_B forwards 603 Decline response to IBCF_A
35			←						603 Decline	IBCF_A forwards 603 Decline response to IMS_A
36		←							603 Decline	IMS_A forwards 603 Decline response to UE_A
37	←									User A is informed that request has been rejected
38		→							ACK	UE_A acknowledges the receipt of 603 Decline response for INVITE
39			→						ACK	IMS_A forwards ACK to IBCF_A
40				→					ACK	IBCF_A forwards ACK to IBCF_B
41					→				ACK	IBCF_B forwards ACK to IMS_B
42					←				ACK	IMS_B forwards ACK to IBCF_B

Step	Direction								Message	Comment
	User A	UEA	IMSA	IBCFA	IBCFB	IMSB	UEB	User B		
43				←					ACK	IBCF_B forwards ACK to IBCF_A
44			←						ACK	IBCF_A forwards ACK to IMS_A
45			—	—	—	—	→		ACK	IMS_A forwards ACK to UE_B
46A	←	—	—	—	—	—	—	→		User A terminates voice call
46B	←	—	—	—	—	—	—	→		User B terminates voice call

4.5.4.3 Pictures sharing

4.5.4.3.1 Pictures sharing- interworking

Interoperability Test Description		
Identifier:	TD_IMS_SHARE_0005	
Summary:	IMS network supports Picture sharing service and messages exchange between two users in their networks can be performed. User A starts video sharing with User B during a voice call	
Configuration:	CF_INT_AS	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5097_01	TS 124 229 [1], clause 5.4.3.2 ¶11 (1st numbered list)
	TP_IMS_5115_02	TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 3rd numbered list)
Use Case ref.:	UC_RCS_8_I	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1A	User A establishes a voice call to user B
	1B	User B establishes a voice call to user A
	2	User A requests to share picture with user B
	3	User B is requested to accept to share picture
	4	User B accepts to share picture
	5	User A is informed that request has been answered
	6	Picture sharing starts
	7	Picture transfer completed (size checked)
	8	User B is informed that picture transfer has finished
	9	User A is informed that picture transfer has finished
	10A	Voice call termination initiated by user A
	10B	Voice call termination initiated by user B

Interoperability Test Description		
Conformance Criteria:	**Check**	

	1	TP_IMS_5097_01 in CFW step 7 (INVITE):
		ensure that {
		when { UE_A sends an initial INVITE to UE_B }
		then { IMS_B receives the initial INVITE
		not containing a Route_header
		indicating the S-CSCF_SIP_URI of IMS_A
		containing a P-Charging-Vector_header
		(containing an icid-value_parameter and
		containing a orig-ioi_parameter indicating IMS_A and
		not containing an access-network-charging-info_parameter and
		not containing a term-ioi_parameter) and
		containing a Record-Route_header
		indicating the originating S-CSCF_SIP_URI }
		}

	2	TP_IMS_5115_02 in CFW step 22 (2xx): *ensure that {* *when { UE_B sends a 2xx_response to UE_A }* *then { IMS_A receives the 2xx_response from IMS_B* *containing a P-Charging-Vector_header* *containing an orig-ioi_parameter* *indicating operator_identifier of IMS_A and* *containing a term-ioi_parameter* *indicating operator_identifier of IMS_B* *}*

Step	Direction	Message	Comment
	User A / UEA / IMSA / IBCFA / IBCFB / IMSB / UEB / User B		
1A	↔ User A ↔ User B		User A establishes a voice call to user B
1B	↔ User A ↔ User B		User B establishes a voice call to user A
2	User A → UEA		User A requests to share picture with user B
3	UEA → IMSA	INVITE	UE_A sends INVITE to share picture with user B
4	IMSA → UEA	100 Trying	IMS_A responds with a 100 Trying provisional response
5	IMSA → IBCFA	INVITE	IMS_A forwards INVITE to IBCF_A
6	IBCFA → IMSA	100 Trying	IBCF_A responds with a 100 Trying provisional response
7	IBCFA → IBCFB	INVITE	IBCF_A forwards INVITE to IBCF_B
8	IBCFB → IBCFA	100 Trying	IBCF_B responds with a 100 Trying provisional response
9	IBCFB → IMSB	INVITE	IBCF_B forwards INVITE to IMS_B
10	IMSB → IBCFB	100 Trying	IMS_B responds with a 100 Trying provisional response
11	IMSB → UEB	INVITE	IMS_B forwards INVITE to UE_B
12	UEB → IMSB	100 Trying	UE_B responds with a 100 Trying provisional response
13	UEB → User B		User B is requested to accept to share picture (optional)
14	UEB → IMSB	180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting (optional)

Step	Direction								Message	Comment
	User A	UE A	IMS A	IBCF A	IBCF B	IMS B	UE B	User B		
15					←				180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B (optional)
16				←					180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A (optional)
17			←						180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A (optional)
18		←							180 Ringing	IMS_A forwards the 180 Ringing response to UE_A (optional)
19							←			User B accepts to share picture
20						←			200 OK	UE_B responds INVITE with 200 OK to indicate that the request has been accepted
21					←				200 OK	IMS_B forwards 200 OK response to IBCF_B
22				←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
23			←						200 OK	IBCF_A forwards 200 OK response to IMS_A
24		←							200 OK	IMS_A forwards 200 OK response to UE_A
25	←									User A is informed that request has been answered
26		→							ACK	UE_A acknowledges the receipt of 200 OK for INVITE
27			→						ACK	IMS_A forwards ACK to IBCF_A
28				→					ACK	IBCF_A forwards ACK to IBCF_B
29					→				ACK	IBCF_B forwards ACK to IMS_B
30						→			ACK	IMS_B forwards ACK to UE_B
31	→	→	→	→	→	→	→	→		Picture sharing starts (see clause 5.3.3Image data via MSRP)
32										Picture transfer completed (size checked)
33		→							BYE	UE_A releases the call with BYE
34			→						BYE	IMS_A forwards BYE to IBCF_A
35				→					BYE	IBCF_A forwards BYE to IBCF_B
36					→				BYE	IBCF_B forwards BYE to IMS_B
37						→			BYE	IMS_B forwards BYE to UE_B
38							→			User B is informed that picture transfer has finished
39						←			200 OK	UE_B sends 200 OK for BYE
40					←				200 OK	IMS_B forwards 200 OK response to IBCF_B
41				←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
42			←						200 OK	IBCF_A forwards 200 OK response to IMS_A
43		←							200 OK	IMS_A forwards the 200 OK response to UE_A

Step	Direction								Message	Comment
	User A	UEA	IMSA	IBCFA	IBCFB	IMSB	UEB	User B		
44										User A is informed that picture transfer has finished
45A	←	—	—	—	—	—	—	→		Voice call termination initiated by user A
45B	←	—	—	—	—	—	—	→		Voice call termination initiated by user B

4.5.4.3.2 Pictures sharing- roaming (optional)

Interoperability Test Description		
Identifier:	TD_IMS_SHARE_0006	
Summary:	IMS network supports Picture sharing service and messages exchange between two users, one user in its home network and one user roaming can be performed. User A starts video sharing with User B during a voice call	
Configuration:	CF_ROAM_AS (OPTIONAL)	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5067_01	TS 124 229 [1], clause 5.2.7.2 ¶5
Use Case ref.:	UC_RCS_8_R	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B via IMS_A optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1A	User A sets up a voice call to user B
	1B	User B sets up a voice call to user A
	2	User A requests to share picture with user B
	3	User B is requested to accept to share picture
	4	User B accepts to share picture
	5	User A is informed that request has been answered
	6	Picture sharing starts
	7	Picture transfer completed (size checked)
	8	User B is informed that picture transfer has finished
	9	User A is informed that picture transfer has finished
	10A	User A terminates voice call
	10B	User B terminates voice call
Conformance Criteria:	**Check**	

	1	TP_IMS_5067_01 in CFW step 7 (INVITE)
		ensure that {
		when { IMS_A receives an initial INVITE from UE_B }
		then { IMS_A sends the INVITE to IMS_B
		containing a P-Charging-Vector_header
		}
		}

Step	Direction								Message	Comment
	User A	UE A	IMS A	IBCF A	IBCF B	IMS B	UE B	User B		
1A	←	←	←	←	←	←	←	←		User A sets up a voice call to user B
1B	←	←	←	←	←	←	←	←		User B sets up a voice call to user A
2	→									User A requests to share picture with user B
3		→							INVITE	UE_A sends INVITE to share picture with user B
4		←							100 Trying	IMS_A responds with a 100 Trying provisional response
5			→						INVITE	IMS_A forwards INVITE to IBCF_A
6			←						100 Trying	IBCF_A responds with a 100 Trying provisional response
7				→					INVITE	IBCF_A forwards INVITE to IBCF_B
8				←					100 Trying	IBCF_B responds with a 100 Trying provisional response
9					→				INVITE	IBCF_B forwards INVITE to IMS_B
10					←				100 Trying	IMS_B responds with a 100 Trying provisional response
11					←				INVITE	IMS_B forwards INVITE to IBCF_B
12					→				100 Trying	IBCF_B responds with a 100 Trying provisional response
13				←					INVITE	IBCF_B forwards INVITE to IBCF_A
14				→					100 Trying	IBCF_A responds with a 100 Trying provisional response
15			←						INVITE	IBCF_A forwards INVITE to IMS_A
16			→						100 Trying	IMS_A responds with a 100 Trying provisional response
17			—	—	→				INVITE	IMS_A forwards INVITE to UE_B
18			←	—	—				100 Trying	UE_B responds with a 100 Trying provisional response
19							→			User B is requested to accept to share picture (optional)
20			←	—	—				180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting (optional)
21			→						180 Ringing	IMS_A forwards 180 Ringing response to IBCF_A (optional)
22				→					180 Ringing	IBCF_A forwards 180 Ringing response to IBCF_B (optional)
23					→				180 Ringing	IBCF_B forwards 180 Ringing response to IMS_B (optional)
24					←				180 Ringing	IMS_B forwards the 180 Ringing response to IBCF_B (optional)
25				←					180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A (optional)
26			←						180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A (optional)
27		←							180 Ringing	IMS_A forwards 180 Ringing response to UE_A (optional)
28							←			User B accepts to share picture
29			←	—	—				200 OK	UE_B responds INVITE with 200 OK to indicate that the request has been accepted
30			→						200 OK	IMS_A forwards 200 OK response to IBCF_A
31				→					200 OK	IBCF_A forwards 200 OK response to IBCF_B
32					→				200 OK	IBCF_B forwards 200 OK response to IMS_B
33					←				200 OK	IMS_B forwards 200 OK response to IBCF_B
34				←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
35			←						200 OK	IBCF_A forwards 200 OK response to IMS_A
36		←								IMS_A forwards 200 OK response to UE_A
37	←									User A is informed that request has been answered

Step	Direction								Message	Comment
	User A	UE A	IMS A	IBCF A	IBCF B	IMS B	UE B	User B		
38		→							ACK	UE_A acknowledges the receipt of 200 OK for INVITE
39			→						ACK	IMS_A forwards ACK to IBCF_A
40				→					ACK	IBCF_A forwards ACK to IBCF_B
41					→				ACK	IBCF_B forwards ACK to IMS_B
42					←				ACK	IMS_B forwards ACK to IBCF_B
43				←					ACK	IBCF_B forwards ACK to IBCF_A
44			←						ACK	IBCF_A forwards ACK to IMS_A
45			—	—	—	—	→		ACK	IMS_A forwards ACK to UE_B
46		—	—	—	—	—	—	→		Picture sharing starts (see clause 5.3.3Image data via MSRP)
47										Picture transfer completed (size checked)
48		→							BYE	UE_A releases the call with BYE
49			→						BYE	IMS_A forwards BYE to IBCF_A
50				→					BYE	IBCF_A forwards BYE to IBCF_B
51					→				BYE	IBCF_B forwards BYE to IMS_B
52					←				BYE	IMS_B forwards BYE to IBCF_B
53				←					BYE	IBCF_B forwards BYE to IBCF_A
54			←						BYE	IBCF_A forwards BYE to IMS_A
55			—	—	—	—	→		BYE	IMS_A forwards BYE to UE_B
56							—	→		User B is informed that picture transfer has finished
57			←	—	—	—	—		200 OK	UE_B sends 200 OK for BYE
58			→						200 OK	IMS_A forwards 200 OK response to IBCF_A
59				→					200 OK	IBCF_A forwards 200 OK response to IBCF_B
60					→				200 OK	IBCF_B forwards 200 OK response to IMS_B
61					←				200 OK	IMS_B forwards the 200 OK response to IBCF_B
62				←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
63			←						200 OK	IBCF_A forwards 200 OK response to IMS_A
64		←							200 OK	IMS_A forwards the 200 OK response to UE_A
65	←									User A is informed that picture transfer has finished
66A	←	—	—	—	—	—	—	→		User A terminates voice call
66B	←	—	—	—	—	—	—	→		User B terminates voice call

4.5.4.4 Pictures sharing rejection

4.5.4.4.1 Pictures sharing rejection - interworking

Interoperability Test Description		
Identifier:	TD_IMS_SHARE_0007	
Summary:	IMS network supports Picture sharing service and messages exchange between two users in their networks can be performed. User A starts video sharing with User B during a voice call, but User B rejects the invitation	
Configuration:	CF_INT_AS	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5097_01	TS 124 229 [1], clause 5.4.3.2 ¶11 (1st numbered list)
Use Case ref.:	UC_RCS_8_I	

Interoperability Test Description		
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1A	User A establishes a voice call to user B
	1B	User B establishes a voice call to user A
	2	User A requests to share picture with user B
	3	User B is requested to accept to share picture
	4	User B rejects to share picture
	5	User A is informed that request has been rejected
	6A	Voice call termination initiated by user A
	6B	Voice call termination initiated by user B
Conformance Criteria:	**Check**	

	1	TP_IMS_5097_01 in CFW step 7 (INVITE):
		ensure that {
		when { UE_A sends an initial INVITE to UE_B }
		then { IMS_B receives the initial INVITE
		not containing a Route_header
		indicating the S-CSCF_SIP_URI of IMS_A
		containing a P-Charging-Vector_header
		(containing an icid-value_parameter and
		containing a orig-ioi_parameter indicating IMS_A and
		not containing an access-network-charging-info_parameter and
		not containing a term-ioi_parameter) and
		containing a Record-Route_header
		indicating the originating S-CSCF_SIP_URI }
		}

Step	Direction								Message	Comment
	User A	UE A	IMS A	IBCF A	IBCF B	IMS B	UE B	User B		
1A	←	←	←	←	←	←	←			User A establishes a voice call to user B
1B	→	→	→	→	→	→	→			User B establishes a voice call to user A
2	→									User A requests to share picture with user B
3		→	→						INVITE	UE_A sends INVITE to share picture with user B
4		←							100 Trying	IMS_A responds with a 100 Trying provisional response
5			→	→					INVITE	IMS_A forwards INVITE to IBCF_A
6			←						100 Trying	IBCF_A responds with a 100 Trying provisional response
7				→	→				INVITE	IBCF_A forwards INVITE to IBCF_B
8				←					100 Trying	IBCF_B responds with a 100 Trying provisional response
9					→	→			INVITE	IBCF_B forwards INVITE to IMS_B
10					←				100 Trying	IMS_B responds with a 100 Trying provisional response
11						→	→		INVITE	IMS_B forwards INVITE to UE_B
12						←			100 Trying	UE_B responds with a 100 Trying provisional response

Step	Direction								Message	Comment
	User A	UEA	IMSA	IBCFA	IBCFB	IMSB	UEB	User B		
13							→			User B is requested to accept to share picture (optional)
14						←			180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting (optional)
15					←				180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B (optional)
16				←					180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A (optional)
17			←						180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A (optional)
18		←							180 Ringing	IMS_A forwards the 180 Ringing response to UE_A (optional)
19							←			User B rejects to share picture
20						←			603 Decline	UE_B responds INVITE with 603 Decline to indicate that the request has been rejected
21					←				603 Decline	IMS_B forwards 603 Decline response to IBCF_B
22				←					603 Decline	IBCF_B forwards 603 Decline response to IBCF_A
23			←						603 Decline	IBCF_A forwards 603 Decline response to IMS_A
24		←							603 Decline	IMS_A forwards 603 Decline response to UE_A
25	←									User A is informed that request has been rejected
26		→							ACK	UE_A acknowledges the receipt of 603 Decline response for INVITE
27			→						ACK	IMS_A forwards ACK to IBCF_A
28				→					ACK	IBCF_A forwards ACK to IBCF_B
29					→				ACK	IBCF_B forwards ACK to IMS_B
30						→			ACK	IMS_B forwards ACK to UE_B
31A	←	←	←	←	←	←	←	←		Voice call termination initiated by user A
31B	←	←	←	←	←	←	←	←		Voice call termination initiated by user B

4.5.4.4.2 Pictures sharing rejection- roaming (optional)

Interoperability Test Description		
Identifier:	TD_IMS_SHARE_0008	
Summary:	IMS network supports Picture sharing service and messages exchange between two users, one user in its home network and one user roaming can be performed. User A starts video sharing with User B during a voice call, but User B rejects the invitation	
Configuration:	CF_ROAM_AS (OPTIONAL)	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5070_01	TS 124 229 [1], clause 5.2.7.3 ¶3
Use Case ref.:	UC_RCS_8_R	

Interoperability Test Description		
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B via IMS_A optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1A	User A sets up a voice call to user B
	1B	User B sets up a voice call to user A
	2	User A requests to share picture with user B
	3	User B is requested to accept to share picture
	4	User B rejects to share picture
	5	User A is informed that request has been rejected
	6A	User A terminates voice call
	6B	User B terminates voice call
Conformance Criteria:	**Check**	
	1	TP_IMS_5070_01 in CFW step 8 (100 Trying) *ensure that {* *when { IMS_A receives an initial INVITE from IMS_B }* *then { IMS_A sends a 100_response to IMS_B* *}* *}*

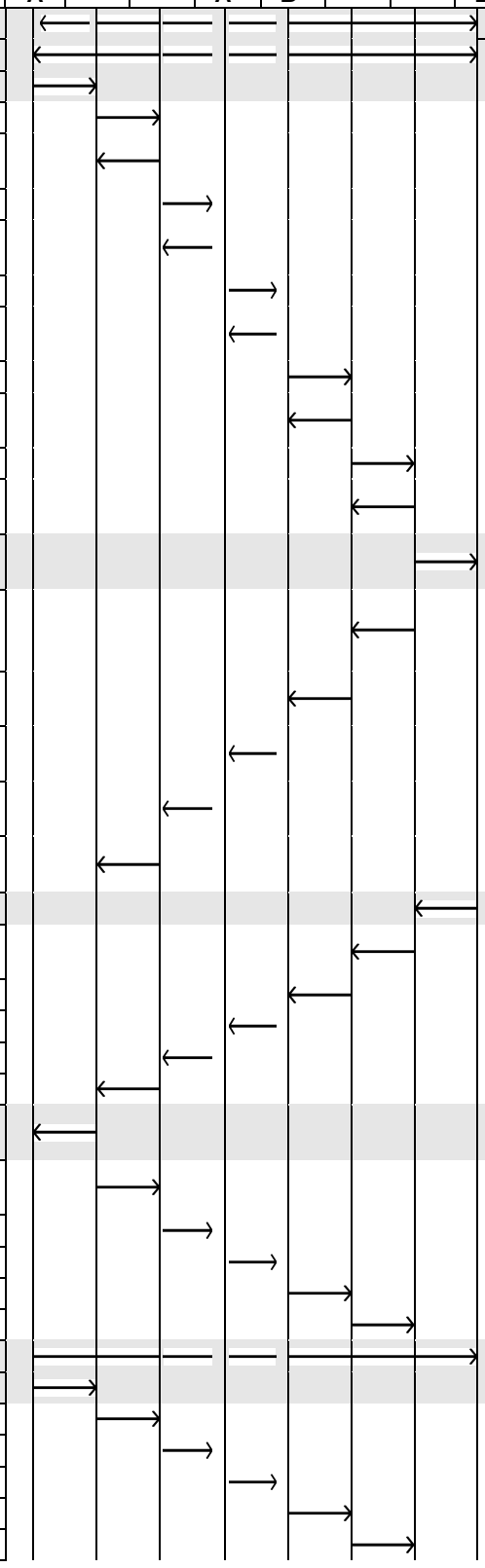
Step	Direction								Message	Comment
	User A	UEA	IMSA	IBCFA	IBCFB	IMSB	UEB	User B		
1A	←	←	←	←	←	←	←	←		User A sets up a voice call to user B
1B	←	←	←	←	←	←	←	←		User B sets up a voice call to user A
2	→									User A requests to share picture with user B
3		→							INVITE	UE_A sends INVITE to share picture with user B
4		←							100 Trying	IMS_A responds with a 100 Trying provisional response
5			→						INVITE	IMS_A forwards INVITE to IBCF_A
6			←						100 Trying	IBCF_A responds with a 100 Trying provisional response
7				→					INVITE	IBCF_A forwards INVITE to IBCF_B
8				←					100 Trying	IBCF_B responds with a 100 Trying provisional response
9					→				INVITE	IBCF_B forwards INVITE to IMS_B
10					←				100 Trying	IMS_B responds with a 100 Trying provisional response
11					←				INVITE	IMS_B forwards INVITE to IBCF_B
12					→				100 Trying	IBCF_B responds with a 100 Trying provisional response
13					←				INVITE	IBCF_B forwards INVITE to IBCF_A
14					→				100 Trying	IBCF_A responds with a 100 Trying provisional response
15			←						INVITE	IBCF_A forwards INVITE to IMS_A
16			→						100 Trying	IMS_A responds with a 100 Trying provisional response

Step	Direction								Message	Comment
	User A	UE A	IMS A	IBCF A	IBCF B	IMS B	UE B	User B		
17			→	→	→		→		INVITE	IMS_A forwards INVITE to UE_B
18			←	→	→		→		100 Trying	UE_B responds with a 100 Trying provisional response
19							→			User B is requested to accept to share picture (optional)
20			←	→	→		→		180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting (optional)
21			→	→					180 Ringing	IMS_A forwards 180 Ringing response to IBCF_A (optional)
22				→	→				180 Ringing	IBCF_A forwards 180 Ringing response to IBCF_B (optional)
23					→	→			180 Ringing	IBCF_B forwards 180 Ringing response to IMS_B (optional)
24					←	→			180 Ringing	IMS_B forwards the 180 Ringing response to IBCF_B (optional)
25				←	→	→			180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A (optional)
26			←	→	→	→			180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A (optional)
27		←	→	→	→	→			180 Ringing	IMS_A forwards 180 Ringing response to UE_A (optional)
28							←			User B rejects to share picture
29			←	→	→	→	→		603 Decline	UE_B responds INVITE with 603 Decline to indicate that the request has been rejected
30			→	→	→	→	→		603 Decline	IMS_A forwards 603 Decline response to IBCF_A
31			→	→	→	→	→		603 Decline	IBCF_A forwards 603 Decline response to IBCF_B
32			→	→	→	→	→		603 Decline	IBCF_B forwards 603 Decline response to IMS_B
33			→	→	→	→	→		603 Decline	IMS_B forwards 603 Decline response to IBCF_B
34			→	→	→	→	→		603 Decline	IBCF_B forwards 603 Decline response to IBCF_A
35			→	→	→	→	→		603 Decline	IBCF_A forwards 603 Decline response to IMS_A
36		←	→	→	→	→	→		603 Decline	IMS_A forwards 603 Decline response to UE_A
37	←	←	→	→	→	→	→			User A is informed that request has been rejected
38		→	→	→	→	→	→		ACK	UE_A acknowledges the receipt of 603 Decline response for INVITE
39			→	→	→	→	→		ACK	IMS_A forwards ACK to IBCF_A
40				→	→	→	→		ACK	IBCF_A forwards ACK to IBCF_B
41					→	→	→		ACK	IBCF_B forwards ACK to IMS_B
42					←	→	→		ACK	IMS_B forwards ACK to IBCF_B
43				←	→	→	→		ACK	IBCF_B forwards ACK to IBCF_A
44			←	→	→	→	→		ACK	IBCF_A forwards ACK to IMS_A
45			→	→	→	→	→		ACK	IMS_A forwards ACK to UE_B
46A	←	←	←	←	←	←	→			User A terminates voice call
46B	←	←	←	←	←	←	→			User B terminates voice call

4.5.4.5 Stop sharing pictures

4.5.4.5.1 Stop sharing pictures - interworking

Interoperability Test Description		
Identifier:	TD_IMS_SHARE_0009	
Summary:	IMS network supports Picture sharing service and messages exchange between two users in their networks can be performed. User A starts video sharing with User B during a voice call, but users decided to stop sharing picture	
Configuration:	CF_INT_AS	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5107_01	TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 6th numbered list)
Use Case ref.:	UC_RCS_8_I	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1A	User A establishes a voice call to user B
	1B	User B establishes a voice call to user A
	2	User A requests to share picture with user B
	3	User B is requested to accept to share picture
	4	User B accepts to share picture
	5	User A is informed that request has been answered
	6	Picture sharing starts
	7A	User A terminates picture sharing
	8A	User B is informed that picture sharing has terminated
	9A	User A is informed that picture sharing has terminated
	10A	Voice call termination initiated by user A
	7B	User B terminates picture sharing
	8B	User A is informed that picture sharing has terminated
	9B	User B is informed that picture sharing has terminated
	10B	Voice call termination initiated by user B
Conformance Criteria:	**Check**	
	1	TP_IMS_5107_01 in CFW step 35A (BYE): *ensure that {* *when { UE_A sends BYE to UE_B }* *then { IMS_B receives the BYE* *not containing Route_header* *indicating the S-CSCF_SIP_URI of IMS_A }* *}*



Step	Direction	Message	Comment
	User A / UE A / IMS A / IBCF A / IBCF B / IMS B / UE B / User B		
1A			User A establishes a voice call to user B
1B			User B establishes a voice call to user A
2			User A requests to share picture with user B
3		INVITE	UE_A sends INVITE to share picture with user B
4		100 Trying	IMS_A responds with a 100 Trying provisional response
5		INVITE	IMS_A forwards INVITE to IBCF_A
6		100 Trying	IBCF_A responds with a 100 Trying provisional response
7		INVITE	IBCF_A forwards INVITE to IBCF_B
8		100 Trying	IBCF_B responds with a 100 Trying provisional response
9		INVITE	IBCF_B forwards INVITE to IMS_B
10		100 Trying	IMS_B responds with a 100 Trying provisional response
11		INVITE	IMS_B forwards INVITE to UE_B
12		100 Trying	UE_B responds with a 100 Trying provisional response
13			User B is requested to accept to share picture (optional)
14		180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting (optional)
15		180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B (optional)
16		180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A (optional)
17		180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A (optional)
18		180 Ringing	IMS_A forwards the 180 Ringing response to UE_A (optional)
19			User B accepts to share picture
20		200 OK	UE_B responds INVITE with 200 OK to indicate that the request has been accepted
21		200 OK	IMS_B forwards 200 OK response to IBCF_B
22		200 OK	IBCF_B forwards 200 OK response to IBCF_A
23		200 OK	IBCF_A forwards 200 OK response to IMS_A
24		200 OK	IMS_A forwards 200 OK response to UE_A
25			User A is informed that request has been answered
26		ACK	UE_A acknowledges the receipt of 200 OK for INVITE
27		ACK	IMS_A forwards ACK to IBCF_A
28		ACK	IBCF_A forwards ACK to IBCF_B
29		ACK	IBCF_B forwards ACK to IMS_B
30		ACK	IMS_B forwards ACK to UE_B
31			Picture sharing starts
32A			User A terminates picture sharing
33A		BYE	UE_A releases the call with BYE
34A		BYE	IMS_A forwards BYE to IBCF_A
35A		BYE	IBCF_A forwards BYE to IBCF_B
36A		BYE	IBCF_B forwards BYE to IMS_B
37A		BYE	IMS_B forwards BYE to UE_B

Step	Direction								Message	Comment
	User A	UEA	IMSA	IBCFA	IBCFB	IMSB	UEB	User B		
38A							→			User B is informed that picture sharing has terminated
39A						←			200 OK	UE_B sends 200 OK for BYE
40A					←				200 OK	IMS_B forwards 200 OK response to IBCF_B
41A				←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
42A			←						200 OK	IBCF_A forwards 200 OK response to IMS_A
43A		←							200 OK	IMS_A forwards the 200 OK response to UE_A
44A										User A is informed that picture sharing has terminated
45A						←			OPTIONS	UE_B sends OPTIONS to IMS_B to verify availability of picture sharing capability of the UE_A
46A					←				OPTIONS	IMS_B forwards OPTIONS to IBCF_B
47A				←					OPTIONS	IBCF_B forwards OPTIONS to IBCF_A
48A			←						OPTIONS	IBCF_A forwards OPTIONS to IMS_A
49A		←							OPTIONS	IMS_A forwards OPTIONS to UE_A
50A		→							200 OK	UE_A responds 200 OK to IMS_A with updated capabilities
51A			→						200 OK	IMS_A forwards 200 OK to IBCF_A
52A				→					200 OK	IBCF_A forwards 200 OK to IBCF_B
53A					→				200 OK	IBCF_B forwards 200 OK to IMS_B
54A						→			200 OK	IMS_B forwards 200 OK to UE_B
55A	←							→		Voice call termination initiated by user A
32B							←			User B terminates picture sharing
33B						←			BYE	UE_B releases the call with BYE
34B					←				BYE	IMS_B forwards BYE to IBCF_B
35B				←					BYE	IBCF_B forwards BYE to IBCF_A
36B			←						BYE	IBCF_A forwards BYE to IMS_A
37B		←							BYE	IMS_A forwards BYE to UE_A
38B	←									User A is informed that picture sharing has terminated
39B		→							200 OK	UE_A sends 200 OK for BYE
40B			→						200 OK	IMS_A forwards 200 OK response to IBCF_A
41B				→					200 OK	IBCF_A forwards 200 OK response to IBCF_B
42B					→				200 OK	IBCF_B forwards 200 OK response to IMS_B
43B						→			200 OK	IMS_B forwards the 200 OK response to UE_B
44B							→			User B is informed that picture sharing has terminated
45B		→							OPTIONS	UE_A sends OPTIONS to IMS_A to verify availability of picture sharing capability of the UE_B
46B			→						OPTIONS	IMS_A forwards OPTIONS to IBCF_A
47B				→					OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
48B					→				OPTIONS	IBCF_B forwards OPTIONS to IMS_B
49B						→			OPTIONS	IMS_B forwards OPTIONS to UE_B
50B						←			200 OK	UE_B responds with 200 OK to IMS_B with updated capabilities
51B					←				200 OK	IMS_B forwards 200 OK to IBCF_B
52B				←					200 OK	IBCF_B forwards 200 OK to IBCF_A
53B			←						200 OK	IBCF_A forwards 200 OK to IMS_A
54B		←							200 OK	IMS_A forwards 200 OK to UE_A
55B										Voice call termination initiated by user B

4.5.4.5.2 Stop sharing pictures - roaming (optional)

Interoperability Test Description		
Identifier:	TD_IMS_SHARE_0010	
Summary:	IMS network supports Picture sharing service and messages exchange between two users, one user in its home network and one user roaming can be performed. User A starts video sharing with User B during a voice call, but users decided to stop sharing picture	
Configuration:	CF_ROAM_AS (OPTIONAL)	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5301_01	TS 124 229 [1], clause 5.4.3.3 ¶126 (8th numbered list)
Use Case ref.:	UC_RCS_8_R	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B via IMS_A optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1A	User A sets up a voice call to user B
	1B	User B sets up a voice call to user A
	2	User A requests to share picture with user B
	3	User B is requested to accept to share picture
	4	User B accepts to share picture
	5	User A is informed that request has been answered
	6	Picture sharing starts
	7A	User A terminates picture sharing
	8A	User B is informed that picture sharing has terminated
	9A	User A is informed that picture sharing has terminated
	10A	User A terminates voice call
	7B	User B terminates picture sharing
	8B	User A is informed that picture sharing has terminated
	9B	User B is informed that picture sharing has terminated
	10B	User B terminates voice call
Conformance Criteria:	**Check**	
	1	TP_IMS_5301_01 in CFW step 50A (BYE) *ensure that {* *when { IUT receives a BYE from UE_A* *}* *then { IUT sends the BYE to IMS_B* *containing no Route_header* *indicating the S-CSCF_SIP_URI of IUT_* *containing a topmost Record-Route_header* *indicating the S-CSCF_SIP_URI of IUT_* *}* *}*

Step	Direction								Message	Comment
	User A	UE A	IMS A	IBCF A	IBCF B	IMS B	UE B	User B		
1A										User A sets up a voice call to user B
1B										User B sets up a voice call to user A
2										User A requests to share picture with user B
3									INVITE	UE_A sends INVITE to share picture with user B
4									100 Trying	IMS_A responds with a 100 Trying provisional response
5									INVITE	IMS_A forwards INVITE to IBCF_A
6									100 Trying	IBCF_A responds with a 100 Trying provisional response
7									INVITE	IBCF_A forwards INVITE to IBCF_B
8									100 Trying	IBCF_B responds with a 100 Trying provisional response
9									INVITE	IBCF_B forwards INVITE to IMS_B
10									100 Trying	IMS_B responds with a 100 Trying provisional response
11									INVITE	IMS_B forwards INVITE to IBCF_B
12									100 Trying	IBCF_B responds with a 100 Trying provisional response
13									INVITE	IBCF_B forwards INVITE to IBCF_A
14									100 Trying	IBCF_A responds with a 100 Trying provisional response
15									INVITE	IBCF_A forwards INVITE to IMS_A
16									100 Trying	IMS_A responds with a 100 Trying provisional response
17									INVITE	IMS_A forwards INVITE to UE_B
18									100 Trying	UE_B responds with a 100 Trying provisional response
19										User B is requested to accept to share picture (optional)
20									180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting (optional)
21									180 Ringing	IMS_A forwards 180 Ringing response to IBCF_A (optional)
22									180 Ringing	IBCF_A forwards 180 Ringing response to IBCF_B (optional)
23									180 Ringing	IBCF_B forwards 180 Ringing response to IMS_B (optional)
24									180 Ringing	IMS_B forwards the 180 Ringing response to IBCF_B (optional)
25									180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A (optional)
26									180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A (optional)
27									180 Ringing	IMS_A forwards 180 Ringing response to UE_A (optional)
28										User B accepts to share picture
29									200 OK	UE_B responds INVITE with 200 OK to indicate that the request has been accepted
30									200 OK	IMS_A forwards 200 OK response to IBCF_A

Step	Direction								Message	Comment
	User A	UEA	IMSA	IBCFA	IBCFB	IMSB	UEB	User B		
31				←					200 OK	IBCF_A forwards 200 OK response to IBCF_B
32					→				200 OK	IBCF_B forwards 200 OK response to IMS_B
33					←				200 OK	IMS_B forwards 200 OK response to IBCF_B
34				←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
35			←						200 OK	IBCF_A forwards 200 OK response to IMS_A
36		←								IMS_A forwards 200 OK response to UE_A
37	←									User A is informed that request has been answered
38		→							ACK	UE_A acknowledges the receipt of 200 OK for INVITE
39			→						ACK	IMS_A forwards ACK to IBCF_A
40				→					ACK	IBCF_A forwards ACK to IBCF_B
41					→				ACK	IBCF_B forwards ACK to IMS_B
42					←				ACK	IMS_B forwards ACK to IBCF_B
43				←					ACK	IBCF_B forwards ACK to IBCF_A
44			←						ACK	IBCF_A forwards ACK to IMS_A
45			→	→	→	→	→		ACK	IMS_A forwards ACK to UE_B
46	→		→	→	→	→	→	→		Picture sharing starts
47A	←		←	←	→	→	→	→		User A terminates picture sharing
48A		→							BYE	UE_A releases the call with BYE
49A			→						BYE	IMS_A forwards BYE to IBCF_A
50A				→					BYE	IBCF_A forwards BYE to IBCF_B
51A					→				BYE	IBCF_B forwards BYE to IMS_B
52A					←				BYE	IMS_B forwards BYE to IBCF_B
53A				←					BYE	IBCF_B forwards BYE to IBCF_A
54A			←						BYE	IBCF_A forwards BYE to IMS_A
55A			→	→	→	→	→		BYE	IMS_A forwards BYE to UE_B
56A							→	→		User B is informed that picture sharing has terminated
57A			←	←	←	←	←		200 OK	UE_B sends 200 OK for BYE
58A			→						200 OK	IMS_A forwards 200 OK response to IBCF_A
59A				→					200 OK	IBCF_A forwards 200 OK response to IBCF_B
60A					→				200 OK	IBCF_B forwards 200 OK response to IMS_B
61A					←				200 OK	IMS_B forwards the 200 OK response to IBCF_B
62A				←					200 OK	IBCF_B forwards 200 OK response to IBCF_A

Step	Direction								Message	Comment
	User A	UE A	IMS A	IBCF A	IBCF B	IMS B	UE B	User B		
63A			←						200 OK	IBCF_A forwards 200 OK response to IMS_A
64A		←							200 OK	IMS_A forwards the 200 OK response to UE_A
65A										User A is informed that picture sharing has terminated
66A			←						OPTIONS	UE_B sends OPTIONS to IMS_A to verify availability of picture sharing capability of the UE_A
67A			→						OPTIONS	IMS_A forwards OPTIONS to IBCF_A
68A				→					OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
69A					→				OPTIONS	IBCF_B forwards OPTIONS to IMS_B
70A					←				OPTIONS	IMS_B forwards OPTIONS to IBCF_B
71A				←					OPTIONS	IBCF_B forwards OPTIONS to IBCF_A
72A			←						OPTIONS	IBCF_A forwards OPTIONS to IMS_A
73A		←							OPTIONS	IMS_A forwards OPTIONS to UE_A
74A		→							200 OK	UE_A responds 200 OK to IMS_A with updated capabilities
75A			→						200 OK	IMS_A forwards 200 OK to IBCF_A
76A				→					200 OK	IBCF_A forwards 200 OK to IBCF_B
77A					→				200 OK	IBCF_B forwards 200 OK to IMS_B
78A					←				200 OK	IMS_B forwards 200 OK to IBCF_B
79A				←					200 OK	IBCF_B forwards 200 OK to IBCF_A
80A			←						200 OK	IBCF_A forwards 200 OK to IMS_A
81A			—	—	—	—	→		200 OK	IMS_A forwards 200 OK to UE_B
82A										User A terminates voice call
47B										User B terminates picture sharing
48B			←						BYE	UE_B releases the call with BYE
49B			→						BYE	IMS_A forwards BYE to IBCF_A
50B				→					BYE	IBCF_A forwards BYE to IBCF_B
51B					→				BYE	IBCF_B forwards BYE to IMS_B
52B					←				BYE	IMS_B forwards BYE to IBCF_B
53B				←					BYE	IBCF_B forwards BYE to IBCF_A
54B			←						BYE	IBCF_A forwards BYE to IMS_A
55B		←							BYE	IMS_A forwards BYE to UE_A
56B	←									User A is informed that picture sharing has terminated
57B		→							200 OK	UE_A sends 200 OK for BYE

Step	Direction								Message	Comment
	User A	UE A	IMS A	IBCF A	IBCF B	IMS B	UE B	User B		
58B			→						200 OK	IMS_A forwards 200 OK response to IBCF_A
59B				→					200 OK	IBCF_A forwards 200 OK response to IBCF_B
60B					→				200 OK	IBCF_B forwards 200 OK response to IMS_B
61B					←				200 OK	IMS_B forwards 200 OK response to IBCF_B
62B				←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
63B			←						200 OK	IBCF_A forwards 200 OK response to IMS_A
64B			—	—	—	→			200 OK	IMS_A forwards the 200 OK response to UE_B
65B										User B is informed that picture sharing has terminated
66B		→							OPTIONS	UE_A sends OPTIONS to IMS_A to verify availability of picture sharing capability of the UE_B
67B			→						OPTIONS	IMS_A forwards OPTIONS to IBCF_A
68B				→					OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
69B					→				OPTIONS	IBCF_B forwards OPTIONS to IMS_B
70B					←				OPTIONS	IMS_B forwards OPTIONS to IBCF_B
71B				←					OPTIONS	IBCF_B forwards OPTIONS to IBCF_A
72B			←						OPTIONS	IBCF_A forwards OPTIONS to IMS_A
73B			—	—	—	→			OPTIONS	IMS_A forwards OPTIONS to UE_B
74B			←	—	—	—			200 OK	UE_B responds with 200 OK to IMS_A with updated capabilities
75B			→						200 OK	IMS_A forwards 200 OK to IBCF_A
76B				→					200 OK	IBCF_A forwards 200 OK to IBCF_B
77B					→				200 OK	IBCF_B forwards 200 OK to IMS_B
78B					←				200 OK	IMS_B forwards 200 OK to IBCF_B
79B				←					200 OK	IBCF_B forwards 200 OK to IBCF_A
80B			←						200 OK	IBCF_A forwards 200 OK to IMS_A
81B		←							200 OK	IMS_A forwards 200 OK to UE_A
82B	←	—	—	—	—	—	—	→		User B terminates voice call

4.5.5 File transfer service

4.5.5.1 Instant file transfer

4.5.5.1.1 Instant file transfer - interworking

Interoperability Test Description		
Identifier:	TD_IMS_FILE_0001	
Summary:	IMS network supports instant File transfer service and messages exchange between two users in their home network can be performed. User A starts file transfer	
Configuration:	CF_INT_AS	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5097_01	TS 124 229 [1], clause 5.4.3.2 ¶11 (1st numbered list)
	TP_IMS_5108_03	TS 124 229 [1], clause 5.4.3.3 ¶5 (item 4 in 1st numbered list)
	TP_IMS_5115_08	TS 124 229 [1], clause 5.4.3.3 ¶89 (3rd numbered list)
Use Case ref.:	UC_RCS_9_I	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User A initiates a file transfer to user B
	2	User B is informed of incoming file and accepts the transfer
	3	User A is informed that file transfer has been accepted by user B
	4	File transfer starts
	5	File transfer completed (size checked)
	6	User B is informed that file transfer completed
	7	User A is informed that file transfer completed
Conformance Criteria:	**Check**	
	1	TP_IMS_5097_01 in CFW step 10 (INVITE): *ensure that {* *when { UE_A sends an initial INVITE to UE_B }* *then { IMS_B receives the initial INVITE* *not containing a Route_header* *indicating the S-CSCF_SIP_URI of IMS_A* *containing a P-Charging-Vector_header* *(containing an icid-value_parameter and* *containing a orig-ioi_parameter indicating IMS_A and* *not containing an access-network-charging-info_parameter and* *not containing a term-ioi_parameter) and* *containing a Record-Route_header* *indicating the originating S-CSCF_SIP_URI }* *}*

Interoperability Test Description		
	2	TP_IMS_5108_03 in CFW step 14 (INVITE) *ensure that {* *when { IUT receives an initial INVITE from IMS_A addressed_to UE_B}* *then { IUT sends the INVITE to AS_B* *containing a topmost Route_header* *indicating the SIP_URI of AS_B and* *containing a Route_header* *indicating the S-CSCF_SIP_URI of IUT_* *containing a P-Charging-Vector_header* *(containing an orig-ioi_parameter* *indicating IMS_A and* *not containing a term-ioi_parameter) }* *}*
	3	TP_IMS_5115_08 in CFW step 25 (200 OK) *ensure that {* *when { IMS_B receives 200_response from AS_B addressed to UE_A }* *then { IMS_B sends the 200_response to IMS_A* *containing a P-Charging-Vector_header* *including a orig-ioi_parameter* *indicating operator_identifier of IMS_A and* *including a term-ioi_parameter* *indicating operator_identifier of IMS_B }* *}*

Step	**Direction**										**Message**	**Comment**
	User A	**UE A**	**AS/ IMA**	**IMS A**	**IBCF A**	**IBCF B**	**IMS B**	**AS/ IMB**	**UE B**	**User B**		
1												User A initiates a file transfer to user B
2											INVITE	UE_A sends INVITE to IMS_A to establish a session with the SDP offer indicating all specific data for a MSRP connection set up
3											100 Trying	IMS_A responds with a 100 Trying provisional response
4											INVITE	IMS_A forwards INVITE to AS/IM_A
5											100 Trying	AS/IM_A responds with a 100 Trying provisional response
6											INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
7											100 Trying	IMS_A responds with a 100 Trying provisional response
8											INVITE	IMS_A forwards INVITE to IBCF_A
9											100 Trying	IBCF_A responds with a 100 Trying provisional response
10											INVITE	IBCF_A forwards INVITE to IBCF_B
11											100 Trying	IBCF_B responds with a 100 Trying provisional response
12											INVITE	IBCF_B forwards INVITE to IMS_B
13											100 Trying	IMS_B responds with a 100 Trying provisional response
14											INVITE	IMS_B forwards INVITE to AS/IM_B
15											100 Trying	AS/IM_B responds with a 100 Trying provisional response
16											INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
17											100 Trying	IMS_B responds with a 100 Trying provisional response
18											INVITE	IMS_B forwards INVITE to UE_B
19											100 Trying	UE_B optionally responds with a 100 Trying provisional response

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
20									→			User B is informed of incoming file and accepts the transfer
21							←				200 OK	UE_B responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform A-side with specific data for a MSRP connection set up
22							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
23							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
24						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
25					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
26				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
27			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
28			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
29		←									200 OK	IMS_A forwards 200 OK response to UE_A
30	←											User A is informed that file transfer has been accepted by user B
31		→									ACK	UE_A acknowledges the receipt of 200 OK for INVITE
32			←								ACK	IMS_A forwards ACK to AS/IM_A
33			→								ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
34				→							ACK	IMS_A forwards ACK to IBCF_A
35					→						ACK	IBCF_A forwards ACK to IBCF_B
36						→					ACK	IBCF_B forwards ACK to IMS_B
37							→				ACK	IMS_B forwards ACK to AS/IM_B
38							←				ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
39							→				ACK	IMS_B forwards ACK to UE_B
40	←									→		File transfer starts (see clause 5.3.3 Image data via MSRP)
41												File transfer completed (size checked)
42		→									BYE	UE_A releases the file transfer session with BYE
43			←								BYE	IMS_A forwards BYE to AS/IM_A
44			→								BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
45				→							BYE	IMS_A forwards BYE to IBCF_A
46					→						BYE	IBCF_A forwards BYE to IBCF_B
47						→					BYE	IBCF_B forwards BYE to IMS_B
48							→				BYE	IMS_B forwards BYE to AS/IM_B
49							←				BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
50							→				BYE	IMS_B forwards BYE to UE_B
51									→			User B is informed that file transfer completed
52							←				200 OK	UE_B sends 200 OK for BYE
53							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B

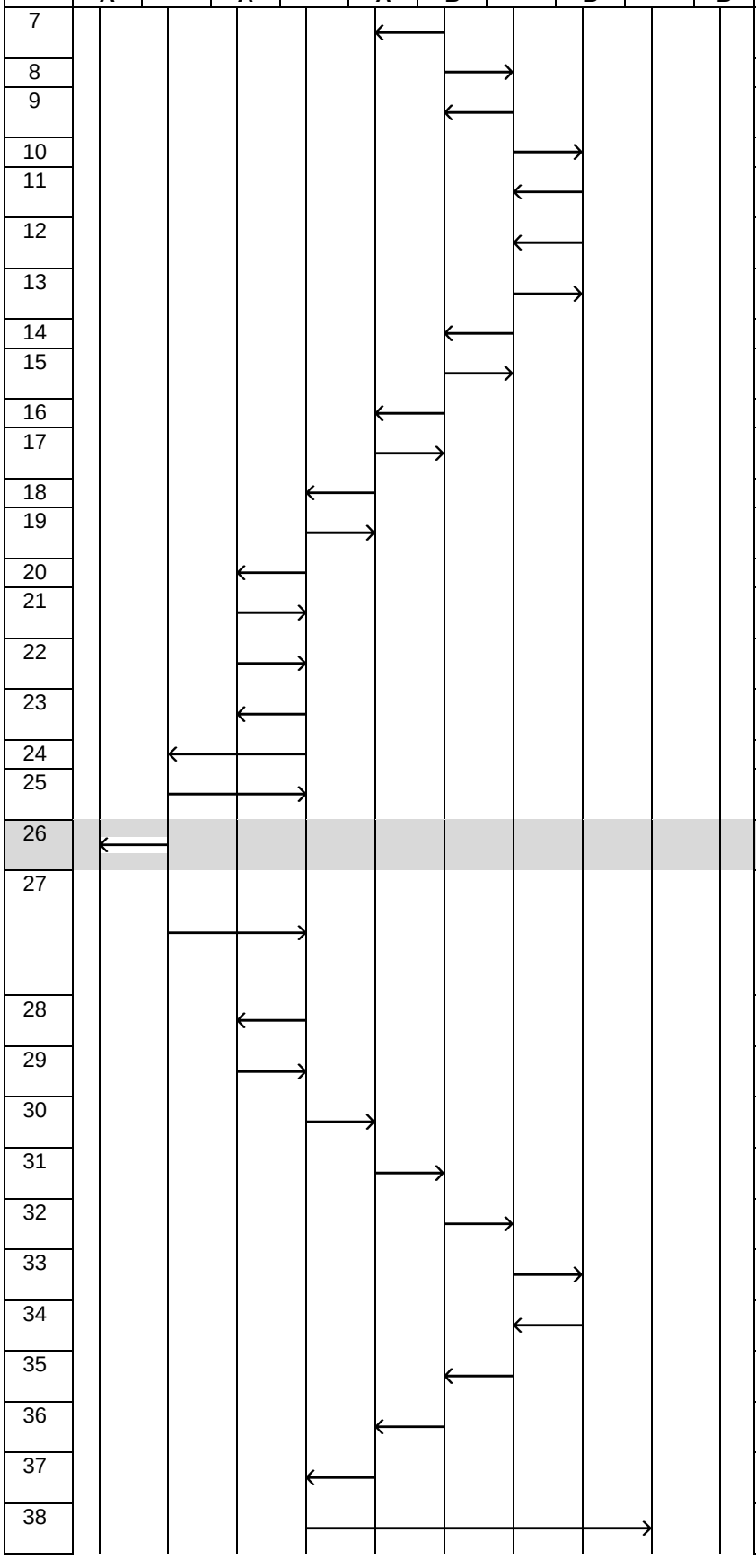
Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
54							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
55						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
56					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
57				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
58			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
59			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
60		←									200 OK	IMS_A forwards 200 OK response to UE_A
61	←											User A is informed that file transfer completed

4.5.5.1.2 Instant file transfer - roaming (optional)

Interoperability Test Description		
Identifier:	TD_IMS_FILE_0002	
Summary:	IMS network supports instant File transfer service and messages exchange between two users, one user in its home network and one user roaming can be performed. User B starts file transfer	
Configuration:	CF_ROAM_AS (OPTIONAL)	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5046_01	TS 124 229 [1], clause 5.2.6.3.3 ¶1 (1st numbered list)
	TP_IMS_5067_01	TS 124 229 [1], clause 5.2.7.2 ¶5
	TP_IMS_5097_09	TS 124 229 [1], clause 5.4.3.2 ¶11 (items 5 and 8 in 1st numbered list)
Use Case ref.:	UC_RCS_9_R	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B via IMS_A optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User B initiates a file transfer to user A
	2	User A is informed of incoming file and accepts the transfer
	3	User B is informed that file transfer has been accepted by user A
	4	File transfer starts
	5	File transfer completed (size checked)
	6	User A is informed that file transfer completed
	7	User B is informed that file transfer completed

Interoperability Test Description		
Conformance Criteria:	**Check**	
	1	TP_IMS_5046_01 in CFW step 6 (INVITE) *ensure that {* *when { IMS_A receives an initial INVITE from UE_B }* *then { IMS_A sends the INVITE to IMS_B* *containing a Route_header* *not indicating the P-CSCF_SIP_URI of IMS_A and* *containing a Route_header* *indicating the "list of Service Route header URIs* *from the registration" and* *containing an additional Via_header* *containing (the P-CSCF_via_port_number and* *(the P-CSCF-FQDN_address or* *the P-CSCF-IP_address)) of IMS_A and* *containing an additional topmost Record-Route_header* *indicating (the P-CSCF_port_number* *'where it awaits subsequent requests' from UE_A and* *(the P-CSCF-FQDN_address or* *the P-CSCF-IP_address)) of IMS_A and* *not containing P-Preferred-Identity_header and* *containing a P-Asserted-Identity_header* *containing an address of UE_B and* *containing a P-Charging-Vector_header* *containing an icid-value_parameter }* *}*
	2	TP_IMS_5067_01 in CFW step 6 (INVITE) *ensure that {* *when { IMS_A receives an initial INVITE from UE_B }* *then { IMS_A sends the INVITE to IMS_B* *containing a P-Charging-Vector_header* *}* *}*
	3	TP_IMS_5097_09 in CFW step 10 (INVITE) *ensure that {* *when { IUT receives an initial INVITE from IMS_A addressed_to UE_A }* *then { IUT sends the initial INVITE to AS_B* *containing a Route_header* *indicating the SIP_URI of AS_B and* *containing a P-Charging-Function-Addresses_header and* *containing a P-Charging-Vector_header* *(containing an orig-ioi_parameter* *indicating IMS_A and* *not containing a term-ioi_parameter and* *containing an access-network-charging-info_parameter) }* *}*

Step	Direction										Message	Comment
	User A	UEA	AS/IMA	IMSA	IBCFA	IBCFB	IMSB	AS/IMB	UEB	User B		
1									←			User B initiates a file transfer to user A
2				←							INVITE	UE_B sends INVITE to IMS_A to establish a new session with the SDP offer indicating all specific data for a new MSRP connection set up
3									→		100 Trying	IMS_A responds with a 100 Trying provisional response
4				→							INVITE	IMS_A forwards INVITE to IBCF_A
5				←							100 Trying	IBCF_A responds with a 100 Trying provisional response
6					→						INVITE	IBCF_A forwards INVITE to IBCF_B



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
7											100 Trying	IBCF_B responds with a 100 Trying provisional response
8											INVITE	IBCF_B forwards INVITE to IMS_B
9											100 Trying	IMS_B responds with a 100 Trying provisional response
10											INVITE	IMS_B forwards INVITE to AS/IM_B
11											100 Trying	AS/IM_B responds with a 100 Trying provisional response
12											INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
13											100 Trying	IMS_B responds with a 100 Trying provisional response
14											INVITE	IMS_B forwards INVITE to IBCF_B
15											100 Trying	IBCF_B responds with a 100 Trying provisional response
16											INVITE	IBCF_B forwards INVITE to IBCF_A
17											100 Trying	IBCF_A responds with a 100 Trying provisional response
18											INVITE	IBCF_A forwards INVITE to IMS_A
19											100 Trying	IMS_A responds with a 100 Trying provisional response
20											INVITE	IMS_A forwards INVITE to AS/IM_A
21											100 Trying	AS/IM_A responds with a 100 Trying provisional response
22											INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
23											100 Trying	IMS_A responds with a 100 Trying provisional response
24											INVITE	IMS_A forwards INVITE to UE_A
25											100 Trying	UE_A optionally responds with a 100 Trying provisional response
26												User A is informed of incoming file and accepts the transfer
27											200 OK	UE_A responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform B-side with specific data for a new MSRP connection set up
28											200 OK	IMS_A forwards 200 OK response to AS/IM_A
29											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
30											200 OK	IMS_A forwards 200 OK response to IBCF_A
31											200 OK	IBCF_A forwards 200 OK response to IBCF_B
32											200 OK	IBCF_B forwards 200 OK response to IMS_B
33											200 OK	IMS_B forwards 200 OK response to AS/IM_B
34											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
35											200 OK	IMS_B forwards 200 OK response to IBCF_B
36											200 OK	IBCF_B forwards 200 OK response to IBCF_A
37											200 OK	IBCF_A forwards 200 OK response to IMS_A
38											200 OK	IMS_A forwards 200 OK response to UE_B

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
39									→			User B is informed that file transfer has been accepted by user B
40				←							ACK	UE_B acknowledges the receipt of 200 OK for INVITE
41				→							ACK	IMS_A forwards ACK to IBCF_A
42					→						ACK	IBCF_A forwards ACK to IBCF_B
43						→					ACK	IBCF_B forwards ACK to IMS_B
44							→				ACK	IMS_B forwards ACK to AS/IM_B
45							←				ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
46						←					ACK	IMS_B forwards ACK to IBCF_B
47					←						ACK	IBCF_B forwards ACK to IBCF_A
48				←							ACK	IBCF_A forwards ACK to IMS_A
49			←								ACK	IMS_A forwards ACK to AS/IM_A
50			→								ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
51		←									ACK	IMS_A forwards ACK to UE_A
52	←									→		File transfer starts (see clause 5.3.3 Image data via MSRP)
53												File transfer completed (size checked)
54				←					←		BYE	UE_B releases the file transfer session with BYE
55				→							BYE	IMS_A forwards BYE to IBCF_A
56					→						BYE	IBCF_A forwards BYE to IBCF_B
57						→					BYE	IBCF_B forwards BYE to IMS_B
58							→				BYE	IMS_B forwards BYE to AS/IM_B
59							←				BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
60						←					BYE	IMS_B forwards BYE to IBCF_B
61					←						BYE	IBCF_B forwards BYE to IBCF_A
62				←							BYE	IBCF_A forwards BYE to IMS_A
63			←								BYE	IMS_A forwards BYE to AS/IM_A
64			→								BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
65		←									BYE	IMS_A forwards BYE to UE_A
66												User A is informed that file transfer completed
67		→									200 OK	UE_A sends 200 OK for BYE
68			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
69			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
70				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
71					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
72						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
73							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
74							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
75						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
76					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A

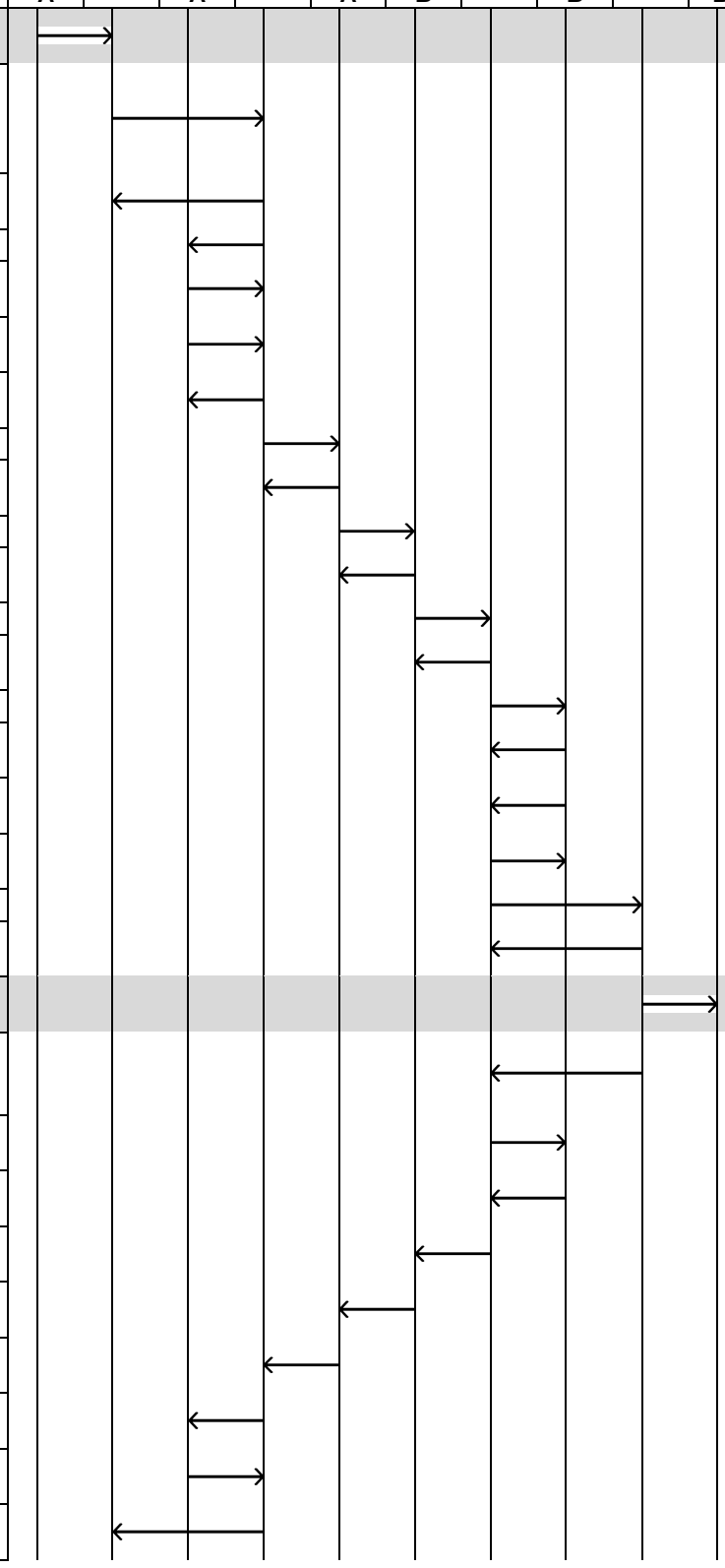
Step	Direction										Message	Comment
	User A	UE A	AS/IMA	IMS A	IBCF A	IBCF B	IMS B	AS/IMB	UE B	User B		
77				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
78				→	→	→	→	→	→		200 OK	IMS_A forwards 200 OK response to UE_B
79									→			User B is informed that file transfer completed

4.5.5.2 Instant file transfer rejection

4.5.5.2.1 Instant file transfer rejection - interworking

Interoperability Test Description		
Identifier:	TD_IMS_FILE_0003	
Summary:	IMS network supports instant File transfer service and messages exchange between two users in their home networks can be performed. User A starts file transfer, but User B rejects the invitation	
Configuration:	CF_INT_AS	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5313_01	TS 124 229 [1], clause 5.4.6.1.3 ¶2
Use Case ref.:	UC_RCS_9_I	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User A initiates a file transfer to user B
	2	User B is informed of incoming file and rejects the transfer
	3	User A is informed that file transfer has been rejected by user B
Conformance Criteria:	**Check**	

	1	TP_IMS_5313_01 in CFW step 25 (603 Decline):
		ensure that {
		when { UE_B sends 603 Decline to UE_A }
		then { AS_A receives the 603 Decline from IMS_A
		containing P-Charging-Vector_header_header
		indicating an access-network-charging-info_parameter
		}
		}



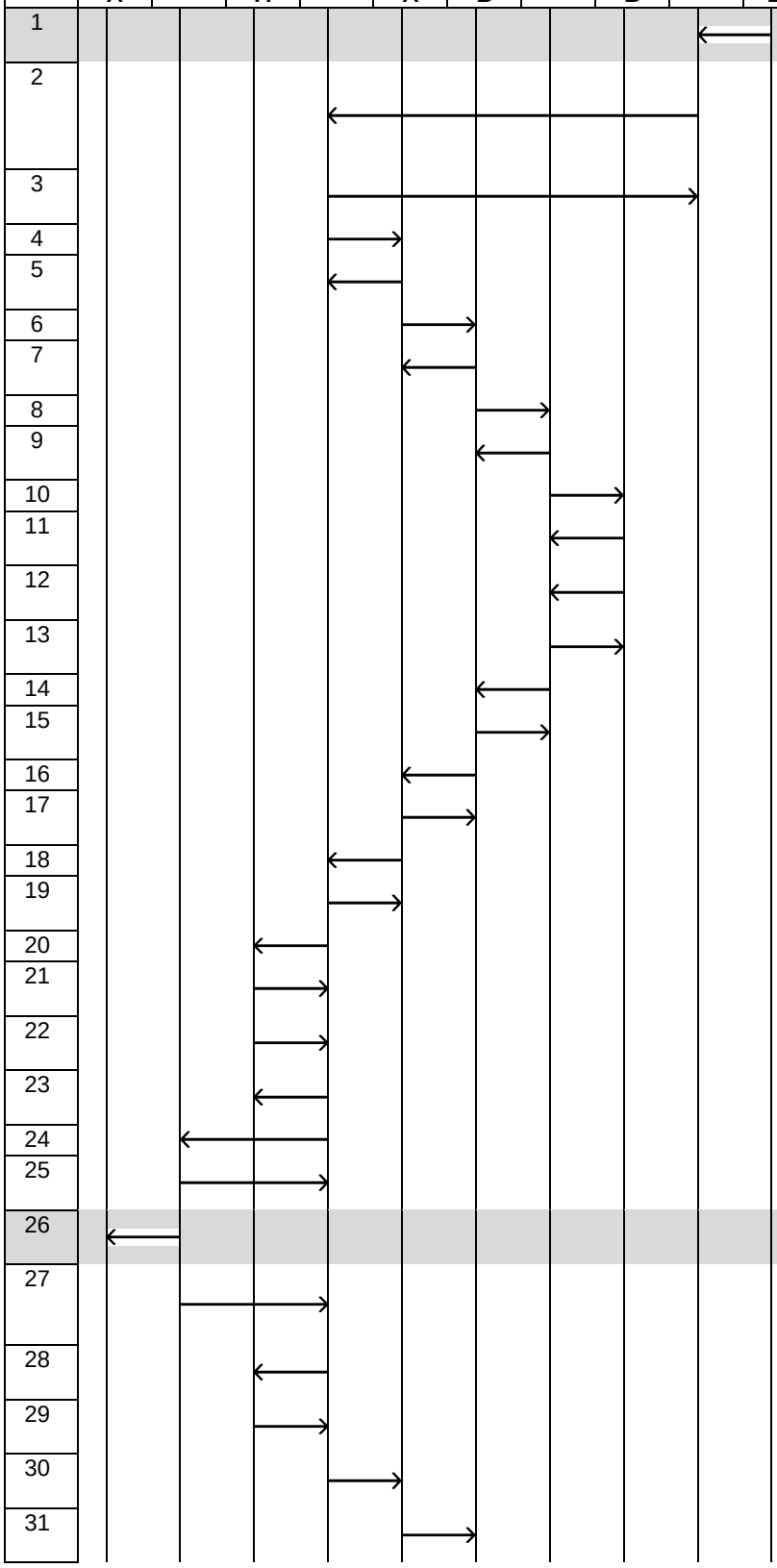
Step	Direction	Message	Comment
	User A / UE A / AS/IM A / IMS A / IBCF A / IBCF B / IMS B / AS/IM B / UE B / User B		
1			User A initiates a file transfer to user B
2		INVITE	UE_A sends INVITE to IMS_A to establish a session with the SDP offer indicating all specific data for a MSRP connection set up
3		100 Trying	IMS_A responds with a 100 Trying provisional response
4		INVITE	IMS_A forwards INVITE to AS/IM_A
5		100 Trying	AS/IM_A responds with a 100 Trying provisional response
6		INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
7		100 Trying	IMS_A responds with a 100 Trying provisional response
8		INVITE	IMS_A forwards INVITE to IBCF_A
9		100 Trying	IBCF_A responds with a 100 Trying provisional response
10		INVITE	IBCF_A forwards INVITE to IBCF_B
11		100 Trying	IBCF_B responds with a 100 Trying provisional response
12		INVITE	IBCF_B forwards INVITE to IMS_B
13		100 Trying	IMS_B responds with a 100 Trying provisional response
14		INVITE	IMS_B forwards INVITE to AS/IM_B
15		100 Trying	AS/IM_B responds with a 100 Trying provisional response
16		INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
17		100 Trying	IMS_B responds with a 100 Trying provisional response
18		INVITE	IMS_B forwards INVITE to UE_B
19		100 Trying	UE_B optionally responds with a 100 Trying provisional response
20			User B is informed of incoming file and rejects the transfer
21		603 Decline	UE_B responds INVITE with 603 Decline to indicate that the session has been rejected
22		603 Decline	IMS_B forwards 603 Decline response to AS/IM_B
23		603 Decline	AS/IM_B returns, possibly modified, 603 Decline response to IMS_B
24		603 Decline	IMS_B forwards 603 Decline response to IBCF_B
25		603 Decline	IBCF_B forwards 603 Decline response to IBCF_A
26		603 Decline	IBCF_A forwards 603 Decline response to IMS_A
27		603 Decline	IMS_A forwards 603 Decline response to AS/IM_A
28		603 Decline	AS/IM_A returns, possibly modified, 603 Decline response to IMS_A
29		603 Decline	IMS_A forwards 603 Decline response to UE_A

Step	Direction										Message	Comment
	User A	UEA	AS/IMA	IMSA	IBCFA	IBCFB	IMSB	AS/IMB	UEB	User B		
30	←											User A is informed that file transfer has been rejected by user B
31		→	→								ACK	UE_A acknowledges the receipt of 603 Decline response for INVITE
32			←								ACK	IMS_A forwards ACK to AS/IM_A
33			→								ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
34				→							ACK	IMS_A forwards ACK to IBCF_A
35					→						ACK	IBCF_A forwards ACK to IBCF_B
36						→					ACK	IBCF_B forwards ACK to IMS_B
37							→				ACK	IMS_B forwards ACK to AS/IM_B
38							←				ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
39								→	→		ACK	IMS_B forwards ACK to UE_B

4.5.5.2.2 Instant file transfer rejection - roaming (optional)

Interoperability Test Description		
Identifier:	TD_IMS_FILE_0004	
Summary:	IMS network supports instant File transfer service and messages exchange between two users, one user in its home network and one user roaming can be performed. User B starts file transfer, but User A rejects the invitation	
Configuration:	CF_ROAM_AS (OPTIONAL)	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5313_01	TS 124 229 [1], clause 5.4.6.1.3 ¶2
Use Case ref.:	UC_RCS_9_R	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B via IMS_A optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User B initiates a file transfer to user A
	2	User A is informed of incoming file and rejects the transfer
	3	User B is informed that file transfer has been rejected by user B
Conformance Criteria:	**Check**	

	1	TP_IMS_5313_01 in CFW step 31 (603 Decline):
		ensure that {
		when { UE_B sends 603 Decline to UE_A }
		then { AS_A receives the 603 Decline from IMS_A
		containing P-Charging-Vector_header_header
		indicating an access-network-charging-info_parameter
		}
		}



Step	Direction	Message	Comment
	User A / UE A / AS/IM A / IMS A / IBCF A / IBCF B / IMS B / AS/IM B / UE B / User B		
1			User B initiates a file transfer to user A
2		INVITE	UE_B sends INVITE to IMS_A to establish a new session with the SDP offer indicating all specific data for a new MSRP connection set up
3		100 Trying	IMS_A responds with a 100 Trying provisional response
4		INVITE	IMS_A forwards INVITE to IBCF_A
5		100 Trying	IBCF_A responds with a 100 Trying provisional response
6		INVITE	IBCF_A forwards INVITE to IBCF_B
7		100 Trying	IBCF_B responds with a 100 Trying provisional response
8		INVITE	IBCF_B forwards INVITE to IMS_B
9		100 Trying	IMS_B responds with a 100 Trying provisional response
10		INVITE	IMS_B forwards INVITE to AS/IM_B
11		100 Trying	AS/IM_B responds with a 100 Trying provisional response
12		INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
13		100 Trying	IMS_B responds with a 100 Trying provisional response
14		INVITE	IMS_B forwards INVITE to IBCF_B
15		100 Trying	IBCF_B responds with a 100 Trying provisional response
16		INVITE	IBCF_B forwards INVITE to IBCF_A
17		100 Trying	IBCF_A responds with a 100 Trying provisional response
18		INVITE	IBCF_A forwards INVITE to IMS_A
19		100 Trying	IMS_A responds with a 100 Trying provisional response
20		INVITE	IMS_A forwards INVITE to AS/IM_A
21		100 Trying	AS/IM_A responds with a 100 Trying provisional response
22		INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
23		100 Trying	IMS_A responds with a 100 Trying provisional response
24		INVITE	IMS_A forwards INVITE to UE_A
25		100 Trying	UE_A optionally responds with a 100 Trying provisional response
26			User A is informed of incoming file and rejects the transfer
27		603 Decline	UE_A responds INVITE with 603 Decline to indicate that the session has been rejected
28		603 Decline	IMS_A forwards 603 Decline response to AS/IM_A
29		603 Decline	AS/IM_A returns, possibly modified, 603 Decline response to IMS_A
30		603 Decline	IMS_A forwards 603 Decline response to IBCF_A
31		603 Decline	IBCF_A forwards 603 Decline response to IBCF_B

Step	Direction										Message	Comment
	User A	UE A	AS/IMA	IMS A	IBCF A	IBCF B	IMS B	AS/IMB	UE B	User B		
32						→					603 Decline	IBCF_B forwards 603 Decline response to IMS_B
33							→				603 Decline	IMS_B forwards 603 Decline response to AS/IM_B
34							←				603 Decline	AS/IM_B returns, possibly modified, 603 Decline response to IMS_B
35						←					603 Decline	IMS_B forwards 603 Decline response to IBCF_B
36					←						603 Decline	IBCF_B forwards 603 Decline response to IBCF_A
37				←							603 Decline	IBCF_A forwards 603 Decline response to IMS_A
38				→	→	→	→	→			603 Decline	IMS_A forwards 603 Decline response to UE_B
39									→			User B is informed that file transfer has been rejected by user B
40				←	←	←	←	←			ACK	UE_B acknowledges the receipt of 603 Decline response for INVITE
41				→	→						ACK	IMS_A forwards ACK to IBCF_A
42					→	→					ACK	IBCF_A forwards ACK to IBCF_B
43						→	→				ACK	IBCF_B forwards ACK to IMS_B
44							→	→			ACK	IMS_B forwards ACK to AS/IM_B
45							←	←			ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
46						←					ACK	IMS_B forwards ACK to IBCF_B
47					←						ACK	IBCF_B forwards ACK to IBCF_A
48				←							ACK	IBCF_A forwards ACK to IMS_A
49			←								ACK	IMS_A forwards ACK to AS/IM_A
50			→								ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
51		←									ACK	IMS_A forwards ACK to UE_A

4.5.5.3 Stop file transfer

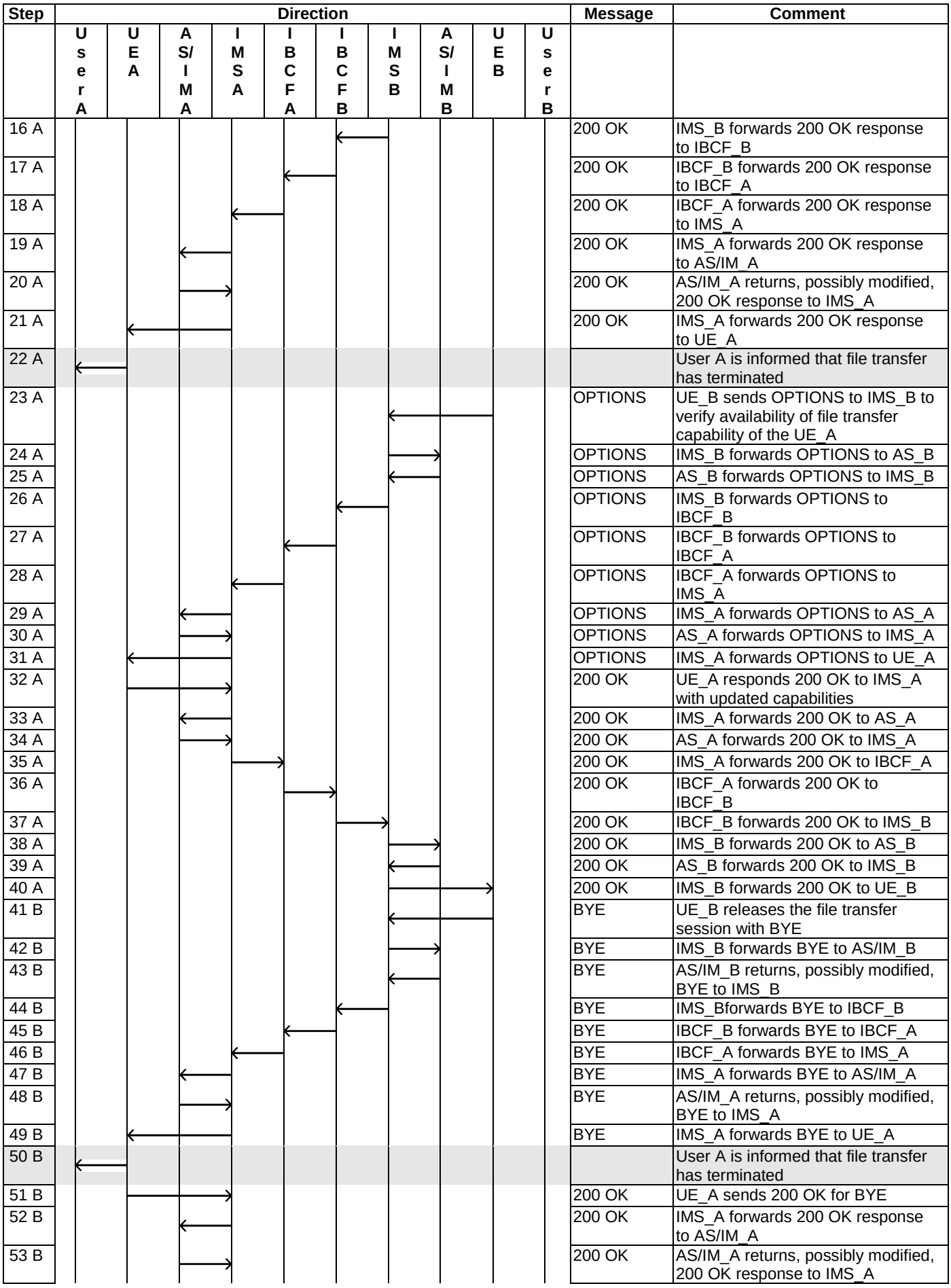
4.5.5.3.1 Stop file transfer - interworking

Interoperability Test Description		
Identifier:	TD_IMS_FILE_0005	
Summary:	IMS network supports instant File transfer service and messages exchange between two users in their home networks can be performed. User A starts file transfer, but User B terminates it in the middle of the process	
Configuration:	CF_INT_AS	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5107_01	TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 6th numbered list)
Use Case ref.:	UC_RCS_9_I	

Interoperability Test Description		
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User A requests a file transfer with user B
	2	User B is requested to accept a file transfer
	3	User B accepts a file transfer
	4	User A is informed that request has been answered
	5	File transfer starts
	6A	User A terminates file transfer
	7A	User B is informed that file transfer has terminated
	8A	User A is informed that file transfer has terminated
	6B	User B terminates file transfer
	7B	User A is informed that file transfer has terminated
	8B	User B is informed that file transfer has terminated
Conformance Criteria:	**Check**	

	1	TP_IMS_5107_01 in CFW step 7A or 45B (BYE):
		ensure that {
		when { UE_B sends BYE to UE_A }
		then { IMS_A receives the BYE
		not containing Route_header
		indicating the S-CSCF_SIP_URI of IMS_A
		}
		}

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
1												Follow UC_RCS_9_I (1-40)
2 A												User A terminates file transfer
3 A		→		→							BYE	UE_A releases the file transfer session with BYE
4 A			←	←							BYE	IMS_A forwards BYE to AS/IM_A
5 A			→								BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
6 A				→	→						BYE	IMS_A forwards BYE to IBCF_A
7 A					→	→					BYE	IBCF_A forwards BYE to IBCF_B
8 A						→	→				BYE	IBCF_B forwards BYE to IMS_B
9 A							→	→			BYE	IMS_B forwards BYE to AS/IM_B
10 A							←	←			BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
11 A							→		→		BYE	IMS_B forwards BYE to UE_B
12 A									→	→		User B is informed that file transfer has terminated
13 A							←		←		200 OK	UE_B sends 200 OK for BYE
14 A							→	→			200 OK	IMS_B forwards 200 OK response to AS/IM_B
15 A							←	←			200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
16 A											200 OK	IMS_B forwards 200 OK response to IBCF_B
17 A											200 OK	IBCF_B forwards 200 OK response to IBCF_A
18 A											200 OK	IBCF_A forwards 200 OK response to IMS_A
19 A											200 OK	IMS_A forwards 200 OK response to AS/IM_A
20 A											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
21 A											200 OK	IMS_A forwards 200 OK response to UE_A
22 A												User A is informed that file transfer has terminated
23 A											OPTIONS	UE_B sends OPTIONS to IMS_B to verify availability of file transfer capability of the UE_A
24 A											OPTIONS	IMS_B forwards OPTIONS to AS_B
25 A											OPTIONS	AS_B forwards OPTIONS to IMS_B
26 A											OPTIONS	IMS_B forwards OPTIONS to IBCF_B
27 A											OPTIONS	IBCF_B forwards OPTIONS to IBCF_A
28 A											OPTIONS	IBCF_A forwards OPTIONS to IMS_A
29 A											OPTIONS	IMS_A forwards OPTIONS to AS_A
30 A											OPTIONS	AS_A forwards OPTIONS to IMS_A
31 A											OPTIONS	IMS_A forwards OPTIONS to UE_A
32 A											200 OK	UE_A responds 200 OK to IMS_A with updated capabilities
33 A											200 OK	IMS_A forwards 200 OK to AS_A
34 A											200 OK	AS_A forwards 200 OK to IMS_A
35 A											200 OK	IMS_A forwards 200 OK to IBCF_A
36 A											200 OK	IBCF_A forwards 200 OK to IBCF_B
37 A											200 OK	IBCF_B forwards 200 OK to IMS_B
38 A											200 OK	IMS_B forwards 200 OK to AS_B
39 A											200 OK	AS_B forwards 200 OK to IMS_B
40 A											200 OK	IMS_B forwards 200 OK to UE_B
41 B											BYE	UE_B releases the file transfer session with BYE
42 B											BYE	IMS_B forwards BYE to AS/IM_B
43 B											BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
44 B											BYE	IMS_Bforwards BYE to IBCF_B
45 B											BYE	IBCF_B forwards BYE to IBCF_A
46 B											BYE	IBCF_A forwards BYE to IMS_A
47 B											BYE	IMS_A forwards BYE to AS/IM_A
48 B											BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
49 B											BYE	IMS_A forwards BYE to UE_A
50 B												User A is informed that file transfer has terminated
51 B											200 OK	UE_A sends 200 OK for BYE
52 B											200 OK	IMS_A forwards 200 OK response to AS/IM_A
53 B											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
54 B				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
55 B					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
56 B						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
57 B							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
58 B							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
59 B							→				200 OK	IMS_B forwards 200 OK response to UE_B
60 B									→			User B is informed that file transfer has terminated
61 B		→									OPTIONS	UE_A sends OPTIONS to IMS_A to verify availability of file transfer capability of the UE_B
62 B			←								OPTIONS	IMS_A forwards OPTIONS to AS_A
63 B			→								OPTIONS	AS_A forwards OPTIONS to IMS_A
64 B				→							OPTIONS	IMS_A forwards OPTIONS to IBCF_A
65 B					→						OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
66 B						→					OPTIONS	IBCF_B forwards OPTIONS to IMS_B
67 B							→				OPTIONS	IMS_B forwards OPTIONS to AS_B
68 B							←				OPTIONS	AS_B forwards OPTIONS to IMS_B
69 B							→				OPTIONS	IMS_B forwards OPTIONS to UE_B
70 B							←				200 OK	UE_B responds 200 OK to IMS_B with updated capabilities
71 B							→				200 OK	IMS_B forwards 200 OK to AS_B
72 B							←				200 OK	AS_B forwards 200 OK to IMS_B
73 B						←					200 OK	IMS_B forwards 200 OK to IBCF_B
74 B					←						200 OK	IBCF_B forwards 200 OK to IBCF_A
75 B				←							200 OK	IBCF_A forwards 200 OK to IMS_A
76 B			←								200 OK	IMS_A forwards 200 OK to AS_A
77 B			→								200 OK	AS_A forwards 200 OK to IMS_A
78 B		←									200 OK	IMS_A forwards 200 OK to UE_A

4.5.5.3.2 Stop file transfer - roaming (optional)

Interoperability Test Description		
Identifier:	TD_IMS_FILE_0006	
Summary:	IMS network supports instant File transfer service and messages exchange between two users, one user in its home network and one user roaming can be performed. User A starts file transfer, but User B terminates it in the middle of the process	
Configuration:	CF_ROAM_AS (OPTIONAL)	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5052_01	TS 124 229 [1], clause 5.2.6.3-9 ¶1 (1st numbered list)
Use Case ref.:	UC_RCS_9_R	

Interoperability Test Description		
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B via IMS_A optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User A requests a file transfer with user B
	2	User B is requested to accept file transfer
	3	User B accepts file transfer
	4	User A is informed that request has been answered
	5	File transfer starts
	6A	User A terminates file transfer
	7A	User B is informed that file transfer has terminated
	8A	User A is informed that file transfer has terminated
	6B	User B terminates file transfer
	7B	User A is informed that file transfer has terminated
	8B	User B is informed that file transfer has terminated
Conformance Criteria:	**Check**	

	1	TP_IMS_5052_01 in CFW step 7A or 56B (BYE):
		ensure that {
		when { IMS_A receives a BYE from UE_B }
		then { IMS_A sends the BYE to IMS_B
		not containing a Route_header
		indicating the P-CSCF_SIP_URI of IMS_A and
		containing the same Record-Route_header
		as in the previous ACK and
		containing a P-Charging-Vector header
		containing an icid-value_parameter
		}
		}

Step	Direction										Message	Comment
	User A	UE A	AS/ IMA	IMS A	IBCF A	IBCF B	IMS B	AS/ IMB	UE B	User B		
1 A												Follow UC_RCS_10_R (1-52)
2 A	→											User A terminates file transfer
3 A		→									BYE	UE_A releases the call with BYE
4 A			←								BYE	IMS_A forwards BYE to AS_A
5 A			→								BYE	AS_A forwards BYE to IMS_A
6 A				→							BYE	IMS_A forwards BYE to IBCF_A
7 A					→						BYE	IBCF_A forwards BYE to IBCF_B
8 A						→					BYE	IBCF_B forwards BYE to IMS_B
9 A							→				BYE	IMS_B forwards BYE to AS_B
10 A							←				BYE	AS_B forwards BYE to IMS_B
11 A						←					BYE	IMS_B forwards BYE to IBCF_B
12 A					←						BYE	IBCF_B forwards BYE to IBCF_A
13 A				←							BYE	IBCF_A forwards BYE to IMS_A
14 A				→				→			BYE	IMS_A forwards BYE to UE_B
15 A									→			User B is informed that file transfer has terminated

Step	Direction										Message	Comment
	User A	UE A	AS/IMA	IMS A	IBCF A	IBCF B	IMS B	AS/IMB	UE B	User B		
16 A				←					←		200 OK	UE_B sends 200 OK for BYE
17 A				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
18 A					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
19 A						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
20 A							→				200 OK	IMS_B forwards the 200 OK response to AS_B
21 A							←				200 OK	AS_B forwards the 200 OK response to IMS_B
22 A						←					200 OK	IMS_B forwards the 200 OK response to IBCF_B
23 A					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
24 A				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
25 A			←								200 OK	IMS_A forwards the 200 OK response to AS_A
26 A			→								200 OK	AS_A forwards the 200 OK response to IMS_A
27 A		←									200 OK	IMS_A forwards the 200 OK response to UE_A
28 A	←											User A is informed that file transfer has terminated
29 A				←					←		OPTIONS	UE_B sends OPTIONS to IMS_A to verify availability of file transfer capability of the UE_A
30 A				→							OPTIONS	IMS_A forwards OPTIONS to IBCF_A
31 A					→						OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
32 A						→					OPTIONS	IBCF_B forwards OPTIONS to IMS_B
33 A							→				OPTIONS	IMS_B forwards OPTIONS to AS_B
34 A							←				OPTIONS	AS_B forwards OPTIONS to IMS_B
35 A						←					OPTIONS	IMS_B forwards OPTIONS to IBCF_B
36 A					←						OPTIONS	IBCF_B forwards OPTIONS to IBCF_A
37 A				←							OPTIONS	IBCF_A forwards OPTIONS to IMS_A
38 A			←								OPTIONS	IMS_A forwards OPTIONS to AS_A
39 A			→								OPTIONS	AS_A forwards OPTIONS to IMS_A
40 A		←									OPTIONS	IMS_A forwards OPTIONS to UE_A
41 A		→									200 OK	UE_A responds 200 OK to IMS_A with updated capabilities
42 A			←								200 OK	IMS_A forwards 200 OK to AS_A
43 A			→								200 OK	AS_A forwards 200 OK to IMS_A
44 A				→							200 OK	IMS_A forwards 200 OK to IBCF_A
45 A					→						200 OK	IBCF_A forwards 200 OK to IBCF_B
46 A						→					200 OK	IBCF_B forwards 200 OK to IMS_B
47 A							→				200 OK	IMS_B forwards 200 OK to AS_B
48 A							←				200 OK	AS_B forwards 200 OK to IMS_B
49 A						←					200 OK	IMS_B forwards 200 OK to IBCF_B
50 A					←						200 OK	IBCF_B forwards 200 OK to IBCF_A
51 A				←							200 OK	IBCF_A forwards 200 OK to IMS_A
52 A				→					→		200 OK	IMS_A forwards 200 OK to UE_B

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
53 B									←			User B terminates file transfer
54 B				←							BYE	UE_B releases the file transfer session with BYE
55 B				→							BYE	IMS_A forwards BYE to IBCF_A
56 B					→						BYE	IBCF_A forwards BYE to IBCF_B
57 B						→					BYE	IBCF_B forwards BYE to IMS_B
58 B							→				BYE	IMS_B forwards BYE to AS/IM_B
59 B							←				BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
60 B						←					BYE	IMS_B forwards BYE to IBCF_B
61 B					←						BYE	IBCF_B forwards BYE to IBCF_A
62 B				←							BYE	IBCF_A forwards BYE to IMS_A
63 B			←								BYE	IMS_A forwards BYE to AS/IM_A
64 B			→								BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
65 B		←									BYE	IMS_A forwards BYE to UE_A
66 B	←											User A is informed that file transfer completed
67 B		→		→							200 OK	UE_A sends 200 OK for BYE
68 B			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
69 B			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
70 B				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
71 B					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
72 B						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
73 B							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
74 B							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
75 B						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
76 B					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
77 B				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
78 B				→					→		200 OK	IMS_A forwards 200 OK response to UE_B
79 B									→			User B is informed that file transfer has terminated
80 B		→		→							OPTIONS	UE_A sends OPTIONS to IMS_A to verify availability of file transfer capability of the UE_B
81 B			←								OPTIONS	IMS_A forwards OPTIONS to AS_A
82 B			→								OPTIONS	AS_A forwards OPTIONS to IMS_A
83 B				→							OPTIONS	IMS_A forwards OPTIONS to IBCF_A
84 B					→						OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
85 B						→					OPTIONS	IBCF_B forwards OPTIONS to IMS_B
86 B							→				OPTIONS	IMS_B forwards OPTIONS to AS_B
87 B							←				OPTIONS	AS_B forwards OPTIONS to IMS_B
88 B						←					OPTIONS	IMS_B forwards OPTIONS to IBCF_B

Step	Direction										Message	Comment
	User A	UE A	AS/IMA	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
89 B					←						OPTIONS	IBCF_B forwards OPTIONS to IBCF_A
90 B				←							OPTIONS	IBCF_A forwards OPTIONS to IMS_A
91 B									→		OPTIONS	IMS_A forwards OPTIONS to UE_B
92 B				←					←		200 OK	UE_B responds with 200 OK to IMS_A with updated capabilities
93 B				→							200 OK	IMS_A forwards 200 OK to IBCF_A
94 B					→						200 OK	IBCF_A forwards 200 OK to IBCF_B
95 B						→					200 OK	IBCF_B forwards 200 OK to IMS_B
96 B							→				200 OK	IMS_B forwards 200 OK to AS_B
97 B							←				200 OK	AS_B forwards 200 OK to IMS_B
98 B						←					200 OK	IMS_B forwards 200 OK to IBCF_B
99 B					←						200 OK	IBCF_B forwards 200 OK to IBCF_A
100B				←							200 OK	IBCF_A forwards 200 OK to IMS_A
101B			←								200 OK	IMS_A forwards 200 OK to AS_A
102B			→								200 OK	AS_A forwards 200 OK to IMS_A
103B		←									200 OK	IMS_A forwards 200 OK to UE_A

4.5.6 Geo-Location Services

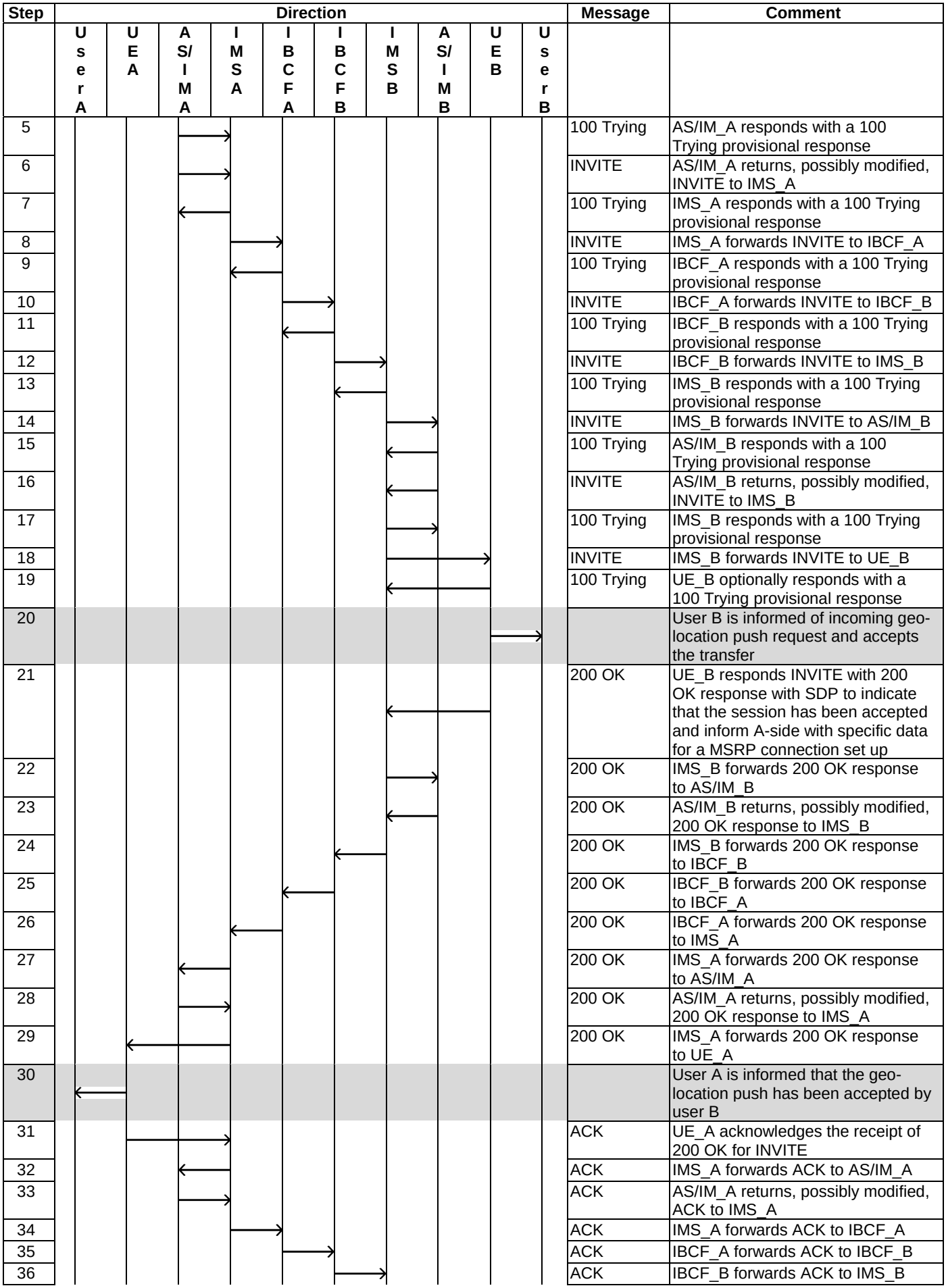
4.5.6.1 Geo-Location Push

4.5.6.1.1 Geo-Location Push - interworking

Interoperability Test Description		
Identifier:	TD_IMS_GEOLOC_0001	
Summary:	IMS network supports instant File transfer service and Geo-Location services and geo-location information exchange between two users in their home network can be performed. User A initiates geo-location push.	
Configuration:	CF_INT_AS	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5097_01	TS 124 229 [1], clause 5.4.3.2 ¶11 (1st numbered list)
	TP_IMS_5108_03	TS 124 229 [1], clause 5.4.3.3 ¶5 (item 4 in 1st numbered list)
	TP_IMS_5115_08	TS 124 229 [1], clause 5.4.3.3 ¶89 (3rd numbered list)
Use Case ref.:	UC_RCS_10_I	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	

Interoperability Test Description		
Test Sequence:	**Step**	
	1	User A initiates a geo-location push to user B
	2	User B is informed of incoming request and accepts the transfer
	3	User A is informed that the geo-location push requests has been accepted by user B
	4	File transfer starts (geo-location info).
	5	File transfer completed (size checked)
	6	User B is informed that file transfer completed
	7	User A is informed that file transfer completed
Conformance Criteria:	**Check**	
	1	TP_IMS_5097_01 in CFW step 10 (INVITE): *ensure that {* *when { UE_A sends an initial INVITE to UE_B }* *then { IMS_B receives the initial INVITE* *not containing a Route_header* *indicating the S-CSCF_SIP_URI of IMS_A* *containing a P-Charging-Vector_header* *(containing an icid-value_parameter and* *containing a orig-ioi_parameter indicating IMS_A and* *not containing an access-network-charging-info_parameter and* *not containing a term-ioi_parameter) and* *containing a Record-Route_header* *indicating the originating S-CSCF_SIP_URI }* *}*
	2	TP_IMS_5108_03 in CFW step 14 (INVITE) *ensure that {* *when { IUT receives an initial INVITE from IMS_A addressed_to UE_B}* *then { IUT sends the INVITE to AS_B* *containing a topmost Route_header* *indicating the SIP_URI of AS_B and* *containing a Route_header* *indicating the S-CSCF_SIP_URI of IUT_* *containing a P-Charging-Vector_header* *(containing an orig-ioi_parameter* *indicating IMS_A and* *not containing a term-ioi_parameter) }* *}*
	3	TP_IMS_5115_08 in CFW step 25 (200 OK) *ensure that {* *when { IMS_B receives 200_response from AS_B addressed to UE_A }* *then { IMS_B sends the 200_response to IMS_A* *containing a P-Charging-Vector_header* *including a orig-ioi_parameter* *indicating operator_identifier of IMS_A and* *including a term-ioi_parameter* *indicating operator_identifier of IMS_B }* *}*

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
1		→										User A initiates a geo-location push to user B
2			→	→							INVITE	UE_A sends INVITE to IMS_A to establish a session with the SDP offer indicating all specific data for a MSRP connection set up
3			←	←							100 Trying	IMS_A responds with a 100 Trying provisional response
4				←							INVITE	IMS_A forwards INVITE to AS/IM_A


Step
Direction
User A
UE A
AS/IM A
IMS A
IBCF A
IBCF B
IMS B
AS/IM B
UE B
User B
Message
Comment
5 100 Trying AS/IM_A responds with a 100 Trying provisional response
6 INVITE AS/IM_A returns, possibly modified, INVITE to IMS_A
7 100 Trying IMS_A responds with a 100 Trying provisional response
8 INVITE IMS_A forwards INVITE to IBCF_A
9 100 Trying IBCF_A responds with a 100 Trying provisional response
10 INVITE IBCF_A forwards INVITE to IBCF_B
11 100 Trying IBCF_B responds with a 100 Trying provisional response
12 INVITE IBCF_B forwards INVITE to IMS_B
13 100 Trying IMS_B responds with a 100 Trying provisional response
14 INVITE IMS_B forwards INVITE to AS/IM_B
15 100 Trying AS/IM_B responds with a 100 Trying provisional response
16 INVITE AS/IM_B returns, possibly modified, INVITE to IMS_B
17 100 Trying IMS_B responds with a 100 Trying provisional response
18 INVITE IMS_B forwards INVITE to UE_B
19 100 Trying UE_B optionally responds with a 100 Trying provisional response
20 User B is informed of incoming geo-location push request and accepts the transfer
21 200 OK UE_B responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform A-side with specific data for a MSRP connection set up
22 200 OK IMS_B forwards 200 OK response to AS/IM_B
23 200 OK AS/IM_B returns, possibly modified, 200 OK response to IMS_B
24 200 OK IMS_B forwards 200 OK response to IBCF_B
25 200 OK IBCF_B forwards 200 OK response to IBCF_A
26 200 OK IBCF_A forwards 200 OK response to IMS_A
27 200 OK IMS_A forwards 200 OK response to AS/IM_A
28 200 OK AS/IM_A returns, possibly modified, 200 OK response to IMS_A
29 200 OK IMS_A forwards 200 OK response to UE_A
30 User A is informed that the geo-location push has been accepted by user B
31 ACK UE_A acknowledges the receipt of 200 OK for INVITE
32 ACK IMS_A forwards ACK to AS/IM_A
33 ACK AS/IM_A returns, possibly modified, ACK to IMS_A
34 ACK IMS_A forwards ACK to IBCF_A
35 ACK IBCF_A forwards ACK to IBCF_B
36 ACK IBCF_B forwards ACK to IMS_B

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
37							→				ACK	IMS_B forwards ACK to AS/IM_B
38							←				ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
39							→		→		ACK	IMS_B forwards ACK to UE_B
40	←									→		File transfer of geo-location info starts (see clause 5.3.3 Image data via MSRP)
41												File transfer completed (size checked)
42		→	→								BYE	UE_A releases the file transfer session with BYE
43			←								BYE	IMS_A forwards BYE to AS/IM_A
44			→								BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
45				→							BYE	IMS_A forwards BYE to IBCF_A
46					→						BYE	IBCF_A forwards BYE to IBCF_B
47						→					BYE	IBCF_B forwards BYE to IMS_B
48							→				BYE	IMS_B forwards BYE to AS/IM_B
49							←				BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
50							→		→		BYE	IMS_B forwards BYE to UE_B
51									→			User B is informed that file transfer of geo-location info completed
52							←		←		200 OK	UE_B sends 200 OK for BYE
53							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
54							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
55						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
56					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
57				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
58			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
59			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
60		←	←								200 OK	IMS_A forwards 200 OK response to UE_A
61	←											User A is informed that file transfer of geo-location info is completed

4.5.6.1.2 Geo-Location Push - roaming (optional)

Interoperability Test Description		
Identifier:	TD_IMS_GEOLOC_0002	
Summary:	IMS network supports instant File transfer service and Geo-location service and geo-location info exchange between two users, one user in its home network and one user roaming can be performed. User B initiates geo-location push.	
Configuration:	CF_ROAM_AS (OPTIONAL)	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5046_01	TS 124 229 [1], clause 5.2.6.3.3 ¶1 (1st numbered list)
	TP_IMS_5067_01	TS 124 229 [1], clause 5.2.7.2 ¶5
	TP_IMS_5097_09	TS 124 229 [1], clause 5.4.3.2 ¶11

Interoperability Test Description		
		(items 5 and 8 in 1st numbered list)
Use Case ref.:	UC_RCS_10_R	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B via IMS_A optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User B initiates a geo-location push to user A
	2	User A is informed of incoming geo-location push request and accepts the transfer
	3	User B is informed that geo-location push has been accepted by user A
	4	File transfer of geo-location info starts
	5	File transfer completed (size checked)
	6	User A is informed that file transfer completed
	7	User B is informed that file transfer completed
Conformance Criteria:	**Check**	
	1	TP_IMS_5046_01 in CFW step 6 (INVITE) *ensure that {* *when { IMS_A receives an initial INVITE from UE_B }* *then { IMS_A sends the INVITE to IMS_B* *containing a Route_header* *not indicating the P-CSCF_SIP_URI of IMS_A and* *containing a Route_header* *indicating the "list of Service Route header URIs* *from the registration" and* *containing an additional Via_header* *containing (the P-CSCF_via_port_number and* *(the P-CSCF-FQDN_address or* *the P-CSCF-IP_address)) of IMS_A and* *containing an additional topmost Record-Route_header* *indicating (the P-CSCF_port_number* *'where it awaits subsequent requests' from UE_A and* *(the P-CSCF-FQDN_address or* *the P-CSCF-IP_address)) of IMS_A and* *not containing P-Preferred-Identity_header and* *containing a P-Asserted-Identity_header* *containing an address of UE_B and* *containing a P-Charging-Vector_header* *containing an icid-value_parameter }* *}*

Interoperability Test Description		
	2	TP_IMS_5067_01 in CFW step 6 (INVITE) *ensure that {* *when { IMS_A receives an initial INVITE from UE_B }* *then { IMS_A sends the INVITE to IMS_B* *containing a P-Charging-Vector_header* *}* *}*
	3	TP_IMS_5097_09 in CFW step 10 (INVITE) *ensure that {* *when { IUT receives an initial INVITE from IMS_A addressed_to UE_A }* *then { IUT sends the initial INVITE to AS_B* *containing a Route_header* *indicating the SIP_URI of AS_B and* *containing a P-Charging-Function-Addresses_header and* *containing a P-Charging-Vector_header* *(containing an orig-ioi_parameter* *indicating IMS_A and* *not containing a term-ioi_parameter and* *containing an access-network-charging-info_parameter) }* *}*

Step	Direction										Message	Comment
	User A	UE A	AS/ IMA	IMS A	IBCF A	IBCF B	IMS B	AS/ IMB	UE B	User B		
1									←			User B initiates a geo-location push to user A
2				←							INVITE	UE_B sends INVITE to IMS_A to establish a new session with the SDP offer indicating all specific data for a new MSRP connection set up
3				→							100 Trying	IMS_A responds with a 100 Trying provisional response
4				→							INVITE	IMS_A forwards INVITE to IBCF_A
5				←							100 Trying	IBCF_A responds with a 100 Trying provisional response
6					→						INVITE	IBCF_A forwards INVITE to IBCF_B
7					←						100 Trying	IBCF_B responds with a 100 Trying provisional response
8						→					INVITE	IBCF_B forwards INVITE to IMS_B
9						←					100 Trying	IMS_B responds with a 100 Trying provisional response
10							→				INVITE	IMS_B forwards INVITE to AS/IM_B
11							←				100 Trying	AS/IM_B responds with a 100 Trying provisional response
12							←				INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
13							→				100 Trying	IMS_B responds with a 100 Trying provisional response
14						←					INVITE	IMS_B forwards INVITE to IBCF_B
15						→					100 Trying	IBCF_B responds with a 100 Trying provisional response
16					←						INVITE	IBCF_B forwards INVITE to IBCF_A
17					→						100 Trying	IBCF_A responds with a 100 Trying provisional response
18				←							INVITE	IBCF_A forwards INVITE to IMS_A
19				→							100 Trying	IMS_A responds with a 100 Trying provisional response
20			←								INVITE	IMS_A forwards INVITE to AS/IM_A
21			→								100 Trying	AS/IM_A responds with a 100 Trying provisional response

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
22			→	→							INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
23			←	←							100 Trying	IMS_A responds with a 100 Trying provisional response
24		←		←							INVITE	IMS_A forwards INVITE to UE_A
25		→		→							100 Trying	UE_A optionally responds with a 100 Trying provisional response
26	←	←										User A is informed of incoming geo-location push and accepts the transfer
27		→		→							200 OK	UE_A responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform B-side with specific data for a new MSRP connection set up
28			←	←							200 OK	IMS_A forwards 200 OK response to AS/IM_A
29			→	→							200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
30				→	→						200 OK	IMS_A forwards 200 OK response to IBCF_A
31					→	→					200 OK	IBCF_A forwards 200 OK response to IBCF_B
32						→	→				200 OK	IBCF_B forwards 200 OK response to IMS_B
33							→	→			200 OK	IMS_B forwards 200 OK response to AS/IM_B
34							←	←			200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
35						←	←				200 OK	IMS_B forwards 200 OK response to IBCF_B
36					←	←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
37				←	←						200 OK	IBCF_A forwards 200 OK response to IMS_A
38				→	→	→	→	→	→		200 OK	IMS_A forwards 200 OK response to UE_B
39									→	→		User B is informed that geo-location push has been accepted by user A
40				←	←	←	←	←	←		ACK	UE_B acknowledges the receipt of 200 OK for INVITE
41				→	→						ACK	IMS_A forwards ACK to IBCF_A
42					→	→					ACK	IBCF_A forwards ACK to IBCF_B
43						→	→				ACK	IBCF_B forwards ACK to IMS_B
44							→	→			ACK	IMS_B forwards ACK to AS/IM_B
45							←	←			ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
46						←	←				ACK	IMS_B forwards ACK to IBCF_B
47					←	←					ACK	IBCF_B forwards ACK to IBCF_A
48				←	←						ACK	IBCF_A forwards ACK to IMS_A
49			←	←							ACK	IMS_A forwards ACK to AS/IM_A
50			→	→							ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
51		←		←							ACK	IMS_A forwards ACK to UE_A
52	←	←	←	←	←	←	←	←	←	→		File transfer of geo-location info starts (see clause 5.3.3 Image data via MSRP)
53												File transfer of geo-location info completed (size checked)

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
54				←					←		BYE	UE_B releases the file transfer session with BYE
55				→							BYE	IMS_A forwards BYE to IBCF_A
56					→						BYE	IBCF_A forwards BYE to IBCF_B
57						→					BYE	IBCF_B forwards BYE to IMS_B
58							→				BYE	IMS_B forwards BYE to AS/IM_B
59							←				BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
60						←					BYE	IMS_B forwards BYE to IBCF_B
61					←						BYE	IBCF_B forwards BYE to IBCF_A
62				←							BYE	IBCF_A forwards BYE to IMS_A
63			←								BYE	IMS_A forwards BYE to AS/IM_A
64			→								BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
65		←									BYE	IMS_A forwards BYE to UE_A
66												User A is informed that file transfer of geo-location info completed
67		→									200 OK	UE_A sends 200 OK for BYE
68			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
69			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
70				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
71					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
72						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
73							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
74							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
75						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
76					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
77				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
78				→					→		200 OK	IMS_A forwards 200 OK response to UE_B
79									→			User B is informed that file transfer of geo-location info completed

4.5.6.2 Geo-Location Pull

4.5.6.2.1 Geo-Location Pull - interworking

Interoperability Test Description	
Identifier:	TD_IMS_GEOLOC_0003
Summary:	IMS network supports instant File transfer service and Geo-Location services and geo-location information exchange between two users in their home network can be performed. User A initiates geo-location pull.
Configuration:	CF_INT_AS
SUT	IMS_A and IMS_B

Interoperability Test Description		
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5097_01	TS 124 229 [1], clause 5.4.3.2 ¶11 (1st numbered list)
	TP_IMS_5108_03	TS 124 229 [1], clause 5.4.3.3 ¶5 (item 4 in 1st numbered list)
	TP_IMS_5115_08	TS 124 229 [1], clause 5.4.3.3 ¶89 (3rd numbered list)
Use Case ref.:	UC_RCS_10_I	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User A initiates a geo-location pull to user B
	2	User B is informed of incoming request and accepts the request and initiates geo-location; push to User A.
	3	User A is informed that the geo-location pull request has been accepted by user B
	4	File transfer starts (geo-location info).
	5	File transfer completed (size checked)
	6	User B is informed that file transfer completed
	7	User A is informed that file transfer completed
Conformance Criteria:	**Check**	
	1	TP_IMS_5097_01 in CFW step 10 (INVITE): *ensure that {* *when { UE_A sends an initial INVITE to UE_B }* *then { IMS_B receives the initial INVITE* *not containing a Route_header* *indicating the S-CSCF_SIP_URI of IMS_A* *containing a P-Charging-Vector_header* *(containing an icid-value_parameter and* *containing a orig-ioi_parameter indicating IMS_A and* *not containing an access-network-charging-info_parameter and* *not containing a term-ioi_parameter) and* *containing a Record-Route_header* *indicating the originating S-CSCF_SIP_URI }* *}*

Interoperability Test Description		
	2	TP_IMS_5108_03 in CFW step 14 (INVITE) *ensure that {* *when { IUT receives an initial INVITE from IMS_A addressed_to UE_B}* *then { IUT sends the INVITE to AS_B* *containing a topmost Route_header* *indicating the SIP_URI of AS_B and* *containing a Route_header* *indicating the S-CSCF_SIP_URI of IUT_* *containing a P-Charging-Vector_header* *(containing an orig-ioi_parameter* *indicating IMS_A and* *not containing a term-ioi_parameter) }* *}*
	3	TP_IMS_5115_08 in CFW step 25 (200 OK) *ensure that {* *when { IMS_B receives 200_response from AS_B addressed to UE_A }* *then { IMS_B sends the 200_response to IMS_A* *containing a P-Charging-Vector_header* *including a orig-ioi_parameter* *indicating operator_identifier of IMS_A and* *including a term-ioi_parameter* *indicating operator_identifier of IMS_B }* *}*

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
1												User A initiates a geo-location pull to user B
2											INVITE	UE_A sends INVITE to IMS_A to establish a session with the SDP offer indicating all specific data for a MSRP connection set up
3											100 Trying	IMS_A responds with a 100 Trying provisional response
4											INVITE	IMS_A forwards INVITE to AS/IM_A
5											100 Trying	AS/IM_A responds with a 100 Trying provisional response
6											INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
7											100 Trying	IMS_A responds with a 100 Trying provisional response
8											INVITE	IMS_A forwards INVITE to IBCF_A
9											100 Trying	IBCF_A responds with a 100 Trying provisional response
10											INVITE	IBCF_A forwards INVITE to IBCF_B
11											100 Trying	IBCF_B responds with a 100 Trying provisional response
12											INVITE	IBCF_B forwards INVITE to IMS_B
13											100 Trying	IMS_B responds with a 100 Trying provisional response
14											INVITE	IMS_B forwards INVITE to AS/IM_B
15											100 Trying	AS/IM_B responds with a 100 Trying provisional response
16											INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
17											100 Trying	IMS_B responds with a 100 Trying provisional response
18											INVITE	IMS_B forwards INVITE to UE_B
19											100 Trying	UE_B optionally responds with a 100 Trying provisional response

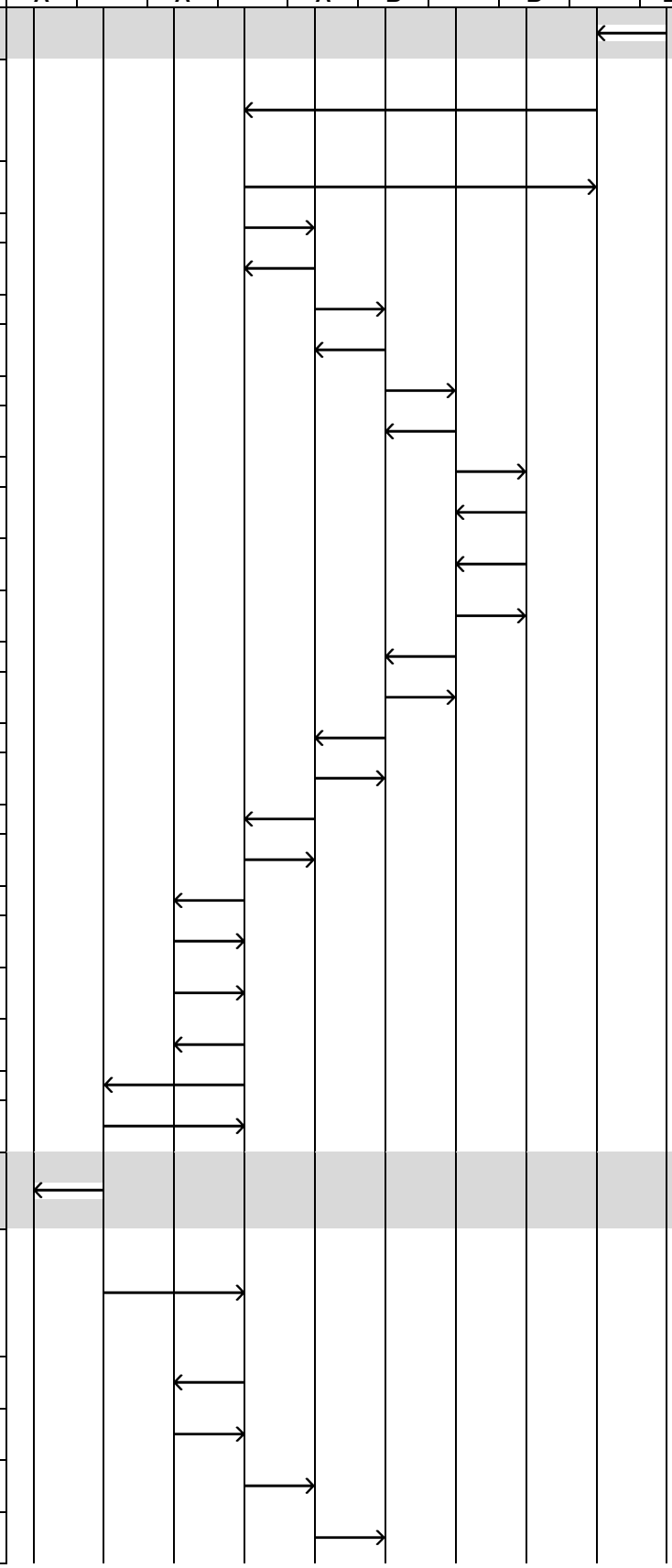
Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
20									→			User B is informed of incoming geo-location pull request and accepts the request to send geo-location info to User A.
21							←				200 OK	UE_B responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform A-side with specific data for a MSRP connection set up
22							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
23							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
24						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
25					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
26				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
27			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
28			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
29		←									200 OK	IMS_A forwards 200 OK response to UE_A
30	←											User A is informed that the geo-location pull request has been accepted by user B
31		→									ACK	UE_A acknowledges the receipt of 200 OK for INVITE
32			←								ACK	IMS_A forwards ACK to AS/IM_A
33			→								ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
34				→							ACK	IMS_A forwards ACK to IBCF_A
35					→						ACK	IBCF_A forwards ACK to IBCF_B
36						→					ACK	IBCF_B forwards ACK to IMS_B
37							→				ACK	IMS_B forwards ACK to AS/IM_B
38							←				ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
39							→				ACK	IMS_B forwards ACK to UE_B
40	←									→		File transfer of geo-location info starts (see clause 5.3.3 Image data via MSRP)
41												File transfer completed (size checked)
42		→									BYE	UE_A releases the file transfer session with BYE
43			←								BYE	IMS_A forwards BYE to AS/IM_A
44			→								BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
45				→							BYE	IMS_A forwards BYE to IBCF_A
46					→						BYE	IBCF_A forwards BYE to IBCF_B
47						→					BYE	IBCF_B forwards BYE to IMS_B
48							→				BYE	IMS_B forwards BYE to AS/IM_B
49							←				BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
50							→				BYE	IMS_B forwards BYE to UE_B
51									→			User B is informed that file transfer of geo-location info completed

Step	Direction										Message	Comment
	User A	UEA	AS/IMA	IMSA	IBCFA	IBCFB	IMSB	AS/IMB	UEB	User B		
52							←				200 OK	UE_B sends 200 OK for BYE
53							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
54							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
55						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
56					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
57				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
58			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
59			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
60		←									200 OK	IMS_A forwards 200 OK response to UE_A
61	←											User A is informed that file transfer of geo-location info is completed

4.5.6.2.2 Geo-Location Pull - roaming (optional)

Interoperability Test Description		
Identifier:	TD_IMS_GEOLOC_0004	
Summary:	IMS network supports instant File transfer service and Geo-location service and geo-location info exchange between two users, one user in its home network and one user roaming can be performed. User B initiates geo-location pull.	
Configuration:	CF_ROAM_AS (OPTIONAL)	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5046_01	TS 124 229 [1], clause 5.2.6.3.3 ¶1 (1st numbered list)
	TP_IMS_5067_01	TS 124 229 [1], clause 5.2.7.2 ¶5
	TP_IMS_5097_09	TS 124 229 [1], clause 5.4.3.2 ¶11 (items 5 and 8 in 1st numbered list)
Use Case ref.:	UC_RCS_10_R	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B via IMS_A optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	

Interoperability Test Description		
Test Sequence:	**Step**	
	1	User B initiates a geo-location pull to user A
	2	User A is informed of incoming geo-location pull request and accepts the request to send geo-location info to User B.
	3	User B is informed that geo-location pull has been accepted by user A
	4	File transfer of geo-location info starts
	5	File transfer completed (size checked)
	6	User A is informed that file transfer completed
	7	User B is informed that file transfer completed
Conformance Criteria:	**Check**	
	1	TP_IMS_5046_01 in CFW step 6 (INVITE) *ensure that {* *when { IMS_A receives an initial INVITE from UE_B }* *then { IMS_A sends the INVITE to IMS_B* *containing a Route_header* *not indicating the P-CSCF_SIP_URI of IMS_A and* *containing a Route_header* *indicating the "list of Service Route header URIs* *from the registration" and* *containing an additional Via_header* *containing (the P-CSCF_via_port_number and* *(the P-CSCF-FQDN_address or* *the P-CSCF-IP_address)) of IMS_A and* *containing an additional topmost Record-Route_header* *indicating (the P-CSCF_port_number* *'where it awaits subsequent requests' from UE_A and* *(the P-CSCF-FQDN_address or* *the P-CSCF-IP_address)) of IMS_A and* *not containing P-Preferred-Identity_header and* *containing a P-Asserted-Identity_header* *containing an address of UE_B and* *containing a P-Charging-Vector_header* *containing an icid-value_parameter }* *}*
	2	TP_IMS_5067_01 in CFW step 6 (INVITE) *ensure that {* *when { IMS_A receives an initial INVITE from UE_B }* *then { IMS_A sends the INVITE to IMS_B* *containing a P-Charging-Vector_header* *}* *}*
	3	TP_IMS_5097_09 in CFW step 10 (INVITE) *ensure that {* *when { IUT receives an initial INVITE from IMS_A addressed_to UE_A }* *then { IUT sends the initial INVITE to AS_B* *containing a Route_header* *indicating the SIP_URI of AS_B and* *containing a P-Charging-Function-Addresses_header and* *containing a P-Charging-Vector_header* *(containing an orig-ioi_parameter* *indicating IMS_A and* *not containing a term-ioi_parameter and* *containing an access-network-charging-info_parameter) }* *}*



Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
1									←			User B initiates a geo-location pull to user A
2				→					←		INVITE	UE_B sends INVITE to IMS_A to establish a new session with the SDP offer indicating all specific data for a new MSRP connection set up
3				→					→		100 Trying	IMS_A responds with a 100 Trying provisional response
4				→	→						INVITE	IMS_A forwards INVITE to IBCF_A
5				←	←						100 Trying	IBCF_A responds with a 100 Trying provisional response
6					→	→					INVITE	IBCF_A forwards INVITE to IBCF_B
7					←	←					100 Trying	IBCF_B responds with a 100 Trying provisional response
8						→	→				INVITE	IBCF_B forwards INVITE to IMS_B
9						←	←				100 Trying	IMS_B responds with a 100 Trying provisional response
10							→	→			INVITE	IMS_B forwards INVITE to AS/IM_B
11							←	←			100 Trying	AS/IM_B responds with a 100 Trying provisional response
12							←	←			INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
13							→	→			100 Trying	IMS_B responds with a 100 Trying provisional response
14						←	←				INVITE	IMS_B forwards INVITE to IBCF_B
15						→	→				100 Trying	IBCF_B responds with a 100 Trying provisional response
16					←	←					INVITE	IBCF_B forwards INVITE to IBCF_A
17					→	→					100 Trying	IBCF_A responds with a 100 Trying provisional response
18				←	←						INVITE	IBCF_A forwards INVITE to IMS_A
19				→	→						100 Trying	IMS_A responds with a 100 Trying provisional response
20			←	←							INVITE	IMS_A forwards INVITE to AS/IM_A
21			→	→							100 Trying	AS/IM_A responds with a 100 Trying provisional response
22			→	→							INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
23			←	←							100 Trying	IMS_A responds with a 100 Trying provisional response
24		←	←	←							INVITE	IMS_A forwards INVITE to UE_A
25		→	→	→							100 Trying	UE_A optionally responds with a 100 Trying provisional response
26	←											User A is informed of incoming geo-location pull and accepts the request to send geo-location info.
27		→	→	→							200 OK	UE_A responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform B-side with specific data for a new MSRP connection set up
28			←	←							200 OK	IMS_A forwards 200 OK response to AS/IM_A
29			→	→							200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
30				→	→						200 OK	IMS_A forwards 200 OK response to IBCF_A
31					→	→					200 OK	IBCF_A forwards 200 OK response to IBCF_B

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
32						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
33							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
34							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
35						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
36					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
37				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
38				→				→			200 OK	IMS_A forwards 200 OK response to UE_B
39									→			User B is informed that geo-location pull has been accepted by user A
40				←				←			ACK	UE_B acknowledges the receipt of 200 OK for INVITE
41				→							ACK	IMS_A forwards ACK to IBCF_A
42					→						ACK	IBCF_A forwards ACK to IBCF_B
43						→					ACK	IBCF_B forwards ACK to IMS_B
44							→				ACK	IMS_B forwards ACK to AS/IM_B
45							←				ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
46						←					ACK	IMS_B forwards ACK to IBCF_B
47					←						ACK	IBCF_B forwards ACK to IBCF_A
48				←							ACK	IBCF_A forwards ACK to IMS_A
49			←								ACK	IMS_A forwards ACK to AS/IM_A
50			→								ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
51		←									ACK	IMS_A forwards ACK to UE_A
52	←									→		File transfer of geo-location info starts (see clause 5.3.3 Image data via MSRP)
53												File transfer of geo-location info completed (size checked)
54				←				←			BYE	UE_B releases the file transfer session with BYE
55				→							BYE	IMS_A forwards BYE to IBCF_A
56					→						BYE	IBCF_A forwards BYE to IBCF_B
57						→					BYE	IBCF_B forwards BYE to IMS_B
58							→				BYE	IMS_B forwards BYE to AS/IM_B
59							←				BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
60						←					BYE	IMS_B forwards BYE to IBCF_B
61					←						BYE	IBCF_B forwards BYE to IBCF_A
62				←							BYE	IBCF_A forwards BYE to IMS_A
63			←								BYE	IMS_A forwards BYE to AS/IM_A
64			→								BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
65		←									BYE	IMS_A forwards BYE to UE_A
66												User A is informed that file transfer of geo-location info completed
67		→									200 OK	UE_A sends 200 OK for BYE
68			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
69			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A

Step	Direction										Message	Comment
	User A	UE A	AS/IMA	IMS A	IBCF A	IBCF B	IMS B	AS/IMB	UE B	User B		
70				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
71					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
72						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
73							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
74							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
75						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
76					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
77				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
78				→	→	→	→	→			200 OK	IMS_A forwards 200 OK response to UE_B
79									→			User B is informed that file transfer of geo-location info completed

4.5.7 Standalone Messaging

4.5.7.1 Standalone Messaging - Interworking

Interoperability Test Description		
Identifier:	TD_IMS_STANDALONEMESS_0001	
Summary:	IMS network supports standalone messaging and such a message exchange between two users in their home network can be performed. User A initiates standalone messaging toward User B .	
Configuration:	CF_INT_AS	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_5097_05	TS 124 229 [1] (V8.10.0), clause 5.4.3.2 ¶1
	TP_IMS_5097_06	TS 124 229 [1] (V8.10.0), clause 5.4.3.2 ¶11 (item 9 in 1st numbered list)
	TP_IMS_5108_04	TS 124 229 [1] (V8.10.0), clause 5.4.3.3 ¶5 (item 4 in1st numbered list)
Use Case ref.:	UC_RCS_11_I	
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	

Interoperability Test Description		
Test Sequence:	**Step**	
	1	User A initiates a standalone message to user B
	2	User B is informed of incoming message.
	3	User A is informed that the SIP MESSAGE has been acknowledged by user B
	4	Optionally User A may be also informed that the message has been delivered and/or read (if requested by User A).
Conformance Criteria:	**Check**	
	1	TP_IMS_5097_05 in CFW step 7 (INVITE): *ensure that {* *when { UE_A sends an initial MESSAGE to UE_B }* *then { IMS_B receives the initial INVITE* *not containing a Route_header* *indicating the S-CSCF_SIP_URI of IMS_A* *containing a P-Charging-Vector_header* *(containing an icid-value_parameter and* *containing a orig-ioi_parameter indicating IMS_A and* *not containing an access-network-charging-info_parameter and* *not containing a term-ioi_parameter) and* *containing a Record-Route_header* *indicating the originating S-CSCF_SIP_URI }* *}*
	2	TP_IMS_5097_06 in CFW step 8 (INVITE) *ensure that {* *when { IUT receives an initial MESSAGE from IMS_A addressed_to UE_B}* *then { IUT sends the INVITE to AS_B* *containing a topmost Route_header* *indicating the SIP_URI of AS_B and* *containing a Route_header* *indicating the S-CSCF_SIP_URI of IUT_* *containing a P-Charging-Vector_header* *(containing an orig-ioi_parameter* *indicating IMS_A and* *not containing a term-ioi_parameter) }* *}*
	3	TP_IMS_5108_04 in CFW step 15 (200 OK) *ensure that {* *when { IMS_B receives 200_response from AS_B addressed to UE_A }* *then { IMS_B sends the 200_response to IMS_A* *containing a P-Charging-Vector_header* *including a orig-ioi_parameter* *indicating operator_identifier of IMS_A and* *including a term-ioi_parameter* *indicating operator_identifier of IMS_B }* *}*

Step	**Direction**										**Message**	**Comment**
	User A	**UE A**	**AS/IM A**	**IMS A**	**IBCF A**	**IBCF B**	**IMS B**	**AS/IM B**	**UE B**	**User B**		
1	→											User A initiates a standalone message to user B
2		→		→							MESSAGE	UE_A sends MESSAGE to IMS_A containing a message body with the standalone message contents.
3			←								MESSAGE	IMS_A forwards MESSAGE to AS/IM_A
4			→								MESSAGE	AS/IM_A returns, possibly modified, MESSAGE to IMS_A
5				→							MESSAGE	IMS_A forwards MESSAGE to IBCF_A

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
6					→						MESSAGE	IBCF_A forwards MESSAGE to IBCF_B
7						→					MESSAGE	IBCF_B forwards MESSAGE to IMS_B
8							→				MESSAGE	IMS_B forwards MESSAGE to AS/IM_B
9							←				MESSAGE	AS/IM_B returns, possibly modified, MESSAGE to IMS_B
10							→				MESSAGE	IMS_B forwards MESSAGE to UE_B
11									→			User B is informed of incoming message.
12							←				200 OK	UE_B responds MESSAGE with 200 OK response
13							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
14							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
15						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
16					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
17				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
18			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
19			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
20		←									200 OK	IMS_A forwards 200 OK response to UE_A
21	←											User A is informed that the SIP MESSAGE was acknowledged.
32												If requested , User A will be informed of the message delivery and/or message being read.

4.5.7.2 Standalone Messaging - Roaming

Interoperability Test Description		
Identifier:	TD_IMS_STANDALONEMESS_0002	
Summary:	IMS network supports standalone messaging and such message exchange between two users, one user in its home network and one user roaming can be performed. User B initiates standalone messaging to User A.	
Configuration:	CF_ROAM_AS (OPTIONAL)	
SUT	IMS_A and IMS_B	
References	**Test Purpose**	**Specification Reference**
	TP_IMS_505001	TS 124 229 [1] (V8.10.0), clause 5.2.6.3.3 ¶(1st numbered list)
	TP_IMS_5097_02	TS 124 229 [1] (V8.10.0), clause 5.4.3.2 ¶11 (item 9 1st numbered list)
	TP_IMS_5108_02	TS 124 229 [1] (V8.10.0), clause 5.4.3.3 ¶5 (1st numbered list)
Use Case ref.:	UC_RCS_11_R	

Interoperability Test Description		
Pre-test conditions:	• HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [7], clause 4.2.1 • UE_A is registered in IMS_A optionally using userPRES according to table 1 • UE_B is registered in IMS_B via IMS_A optionally using userPRES according to table 1 • IMS_A is configured to contact AS_A • IMS_B is configured to contact AS_B • IMS_A is within the trust domain of IMS_B • UE_A and UE_B have already performed capability discovery process • IMS_A not configured for topology hiding	
Test Sequence:	**Step**	
	1	User B initiates a standalone message to user A
	2	User A is informed of incoming standalone message.
	3	User B is informed the SIP message is acknowledged.
	4	Optionally User B may be also informed that the message has been delivered and/or read (if requested by User B).
Conformance Criteria:	**Check**	
	1	TP_IMS_5050_01 in CFW step 3 (MESSAGE) *ensure that {* *when { IMS_A receives a MESSAGE from UE_B }* *then { IMS_A sends the MESSAGE to IMS_B* *containing a Route_header* *not indicating the P-CSCF_SIP_URI of IMS_A and* *containing a Route_header* *indicating the "list of Service Route header URIs* *from the registration" and* *containing an additional Via_header* *containing (the P-CSCF_via_port_number and* *(the P-CSCF-FQDN_address or* *the P-CSCF-IP_address)) of IMS_A and* *containing an additional topmost Record-Route_header* *indicating (the P-CSCF_port_number* *'where it awaits subsequent requests' from UE_A and* *(the P-CSCF-FQDN_address or* *the P-CSCF-IP_address)) of IMS_A and* *not containing P-Preferred-Identity_header and* *containing a P-Asserted-Identity_header* *containing an address of UE_B and* *containing a P-Charging-Vector_header* *containing an icid-value_parameter }* *}*
	2	TP_IMS_5097_02 in CFW step 3 (MESSAGE) *ensure that {* *when { IMS_A receives a MESSAGE from UE_B }* *then { IMS_A sends the MESSAGE to IMS_B* *containing a P-Charging-Vector_header* *}* *}*
	3	TP_IMS_5108_02 in CFW step 6 (MESSAGE) *ensure that {* *when { IUT receives a MESSAGE from IMS_A addressed_to UE_A }* *then { IUT sends the MESSAGE to AS_B* *containing a Route_header* *indicating the SIP_URI of AS_B and* *containing a P-Charging-Function-Addresses_header and* *containing a P-Charging-Vector_header* *(containing an orig-ioi_parameter* *indicating IMS_A and* *not containing a term-ioi_parameter and* *containing an access-network-charging-info_parameter) }* *}*

Step	Direction										Message	Comment
	User A	UE A	AS/IM A	IMS A	IBCF A	IBCF B	IMS B	AS/IM B	UE B	User B		
1									←			User B initiates a standalone message to user A
2				←							MESSAGE	UE_B sends MESSAGE to IMS_A with the standalone message in the message body.
3				→							MESSAGE	IMS_A forwards MESSAGE to IBCF_A
4					→						MESSAGE	IBCF_A forwards MESSAGE to IBCF_B
5						→					MESSAGE	IBCF_B forwards MESSAGE to IMS_B
6							→				MESSAGE	IMS_B forwards MESSAGE to AS/IM_B
7							←				MESSAGE	AS/IM_B returns, possibly modified, MESSAGE to IMS_B
8						←					MESSAGE	IMS_B forwards MESSAGE to IBCF_B
9					←						MESSAGE	IBCF_B forwards MESSAGE to IBCF_A
10				←							MESSAGE	IBCF_A forwards MESSAGE to IMS_A
11			←								MESSAGE	IMS_A forwards MESSAGE to AS/IM_A
12			→								MESSAGE	AS/IM_A returns, possibly modified, MESSAGE to IMS_A
13		←									MESSAGE	IMS_A forwards MESSAGE to UE_A
14	←											User A is informed of incoming standalone message.
15		→									200 OK	UE_A responds MESSAGE with 200 OK response
16			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
17			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
18				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
19					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
20						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
21							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
22							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
23						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
24					←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
25				←							200 OK	IBCF_A forwards 200 OK response to IMS_A
26				→					→		200 OK	IMS_A forwards 200 OK response to UE_B
27									→			User B is informed that the SIP MESSAGE is acknowledged.
28												If requested, ser B will be informed that the message has been delivered and/or that the message has been read.

4.5.8 Multi-Tasking

The Test Descriptions for multi-tasking may be derived for with reference to clauses 4.5.1 through 4.5.7 in conjunction with the test Descriptions documented in TS 186 011-2 [7] and RFC 4976 [9].

5 MSRP Test Specification

5.1 Introduction

MSRP is a text based, connection-oriented protocol specified in RFC 4975 [8], RFC 4976 [9] and RFC 6135 [10]. It is not designed for use as a standalone protocol and therefore it can be part of the SIP protocol. The MSRP URIs are exchanged using SDP in an offer/answer exchange via SIP.

NOTE: The following test descriptions are referenced within the IMS-NNI Interoperability test descriptions.

5.2 Test Prerequisites

5.2.1 Authorization over MSRP

Client that wants to use the services of IM AS they need to authenticate with authorization procedure. Expected authorization procedure is detailed described in RFC 4976 [9] and its MSRP sequence diagram is:

Step	Direction		Message	Comment
	UE	AS IM		
1	→		AUTH	The UE sends AUTH
2	←		401 Unauthorized	The AS IM responds with a valid HTTP Digest authentication challenge
3	→		AUTH	The UE sends another AUTH with authentication
4	←		200 OK	The AS IM responds with 200 OK.

5.3 Use Cases

The test descriptions with call flow diagrams in clauses 4.5.3 to 4.5.5 contain basic MSRP transactions which are only marked symbolically, e.g. "Users perform chatting". Detailed MSRP call flows are described in the present clause. This split of MSRP and SIP signalling has been chosen to keep the test description more readable.

5.3.1 Chat 1 to 1 via MSRP

Use case index UC_MSRP_01 is used.

NOTE: Call flows show only the first chat transmission from one user to another and back. Other transmissions follow depending on who sends the next text message to the other user; this message is transferred with SEND request to the other user.

Step	Direction								Message	Comment
	User A	UE A					UE B	User B		
1	→									User A write a chat message
2		→	→	→	→	→	→		SEND	UE A sends SEND MSRP with content to UE B
3		←	←	←	←	←	←		200 OK	UE B responds with 200 OK to UE A
4							→			User B read a chat message
5							←			User B write a chat message
6		←	←	←	←	←	←		SEND	UE B sends SEND MSRP with content to UE A
7		→	→	→	→	→	→		200 OK	UE A responds with 200 OK to UE B
8	←									User A read a chat message

5.3.2 Chat 1 to many via MSRP

NOTE: Call flows show only the first chat transmission from one user to all other users. Other transmissions follow depending on who sends the next text message to the other user; this message is transferred with SEND request to the other parties.

5.3.2.1 Chat 1 to many via MSRP - Interworking

Use case index UC_MSRP_02_I is used.

Step	Direction								Message	Comment
	User A	UE A	AS/IMA		UE B	User B	UE C	User C		
1	→									User A write a chat message
2		→	→	→	→	→	→	→	SEND	UE A sends SEND MSRP with content to IM SERVER
3		←	←	←	←	←	←	←	200 OK	IM SERVER responds with 200 OK to UE A
4			→	→	→	→	→	→	SEND	IM SERVER sends SEND MSRP with content to UE B
5			←	←	←	←	←	←	200 OK	UE responds with 200 OK to IM SERVER
6					→	→	→	→		User B read a chat message
7			→	→	→	→	→	→	SEND	IM SERVER sends SEND MSRP with content to UE C
8			←	←	←	←	←	←	200 OK	UE C responds with 200 OK to IM SERVER
9							→	→		User C read a chat message

5.3.2.2 Chat 1 to many via MSRP - Roaming

Use case index UC_MSRP_02_R is used.

Step	Direction								Message	Comment
	User A	UE A		AS/IM B	UE B	User B	UE C	User C		
1				←					SEND	UE A sends SEND MSRP with content to IM SERVER
2				→					200 OK	IM SERVER responds with 200 OK to UE A
3					←					User B write a chat message
4		←							SEND	IM SERVER sends SEND MSRP with content to UE B
5			→						200 OK	UE responds with 200 OK to IM SERVER
6	←									User A read a chat message
7					→				SEND	IM SERVER sends SEND MSRP with content to UE C
8				←					200 OK	UE C responds with 200 OK to IM SERVER
9							→			User C read a chat message

5.3.2.3 Chat 1 to many via MSRP to additional user - Interworking

Use case index UC_MSRP_03_I is used.

Step	Direction								Message	Comment
	User A	UE A	AS/IM A				UE D	User D		
1										Follow UC_MSRP_02_I
2				→	→	→	→		SEND	IM SERVER sends SEND MSRP with content to UE D
3			←						200 OK	UE D responds with 200 OK to IM SERVER
4							→			User D read a chat message

5.3.2.4 Chat 1 to many via MSRP to additional user - Roaming

Use case index UC_MSRP_03_R is used.

Step	Direction								Message	Comment
	User A	UE A		AS/IM B	UE B	User B	UE D	User D		
1										Follow UC_MSRP_02_R
2				→	→	→	→		SEND	IM SERVER sends SEND MSRP with content to UE D
3				←					200 OK	UE D responds with 200 OK to IM SERVER
4							→			User D read a chat message

5.3.3 Image data via MSRP

Use case index UC_MSRP_04 is used.

NOTE: Call flows show only the first picture transmission from one user to another and back. Other chunk transmissions in case of bigger files follow with SEND requests.

Step	Direction	Message	Comment
	User A / UE A / UE B / User B		
1	→		User A select a picture
2	→	SEND (image)	UE A sends SEND MSRP with content to UE B
3	←	200 OK	UE B responds with 200 OK to UE A
4	→		User B look a picture

5.4 Test Descriptions

5.4.1 Chat 1 to 1 procedure via MSRP

Interoperability Test Description		
Identifier:	TD_MSRP_CHAT_0001	
Summary:	User A transfers a message with SEND request to User B via MSRP and if endpoint receives a request it shall immediately generate a response and send it back.	
Configuration:	CF_INT_AS	
SUT	UE_A and UE_B	
References	**Test Purpose**	**Specification Reference**
	TP_MSRP_9000_01	RFC 4975 [8], clauses 5.4 and 7.1
	TP_MSRP_9000_02	RFC 4975 [8], clause 7.2
Use Case ref.:	UC_MSRP_01	
Pre-test conditions:	• UE_A has_initiated_a_dialog_with UE_B	
Test Sequence:	**Step**	
	1	User A writes a chat message
	2	User B reads a chat message
Conformance Criteria:	**Check**	
	1	TP_MSRP_9000_01 *ensure that {* *when { User A initiates the call to User B }* *then { UE_A sends the initial INVITE* *containing an offered session-description* *indicating a session of MSRP* *}* *}*
	2	TP_MSRP_9000_02 *ensure that {* *when { UE_A sends SEND_MSRP to UE_B }* *then { UE_A receives the INVITE200 OK response* *containing an offered session-description* *indicating a session of MSRP* *}* *}*

Interoperability Test Description		
	1	TP_MSRP_9000_03 step 2 and 6 (SEND): *ensure that {* *when { UE_A sends SEND_MSRP to UE_B }* *then { UE_B receives the SEND_MSRP* *containing FromPath_header* *indicating the msrp_path from SDP attribute within SIP INVITE* *containing ToPath_header* *indicating the msrp_path from SDP attribute within SIP 200_response* *containing Content-Type_header* *indicating text/plain* *}* *}*
	2	TP_MSRP_9001_04 step 3 and 7 (200 OK SEND): *ensure that {* *when { UE_B receives SEND_MSRP from UE_A }* *then { UE_B sends the 200_response_MSRP* *containing FromPath_header* *indicating the msrp_path from SDP attribute within SIP INVITE* *containing ToPath_header* *indicating the msrp_path from SDP attribute within SIP 200_response* *}* *}*

Step	Direction								Message	Comment
	User A	UE A					UE B	User B		
1	→									User A writes a chat message
2		→			→				SEND	UE A sends SEND MSRP with content to UE B
3		←			←				200 OK	UE B responds with 200 OK to UE A
4							→			User B reads a chat message
5							←			User B writes a chat message
6		←			←				SEND	UE B sends SEND MSRP with content to UE A
7		→			→				200 OK	UE A responds with 200 OK to UE B
8	←									User A reads a chat message

5.4.2 Chat 1 to many procedure via MSRP

Interoperability Test Description		
Identifier:	TD_MSRP_CHAT_0002	
Summary:	User A transfers message with SEND request to AS IM via MSRP. AS IM transfers message to User B and User C like it is predefined in previous SIP dialog. If end users receive a request they shall immediately generate a response and send it back to AS IM which sends the response back to User A.	
Configuration:		
SUT	UE_A, UE_B, UE_C and AS IM	
References	**Test Purpose**	**Specification Reference**
	TP_MSRP_9000_01	RFC 4975 [8], clause 5.4 and 7.1
	TP_MSRP_9000_02	RFC 4975 [8], clause 7.2
Use Case ref.:	UC_MSRP_02_I	
Pre-test conditions:	• UE_A has_initiated_a_dialog_with UE_B and UE_C	

Interoperability Test Description		
Test Sequence:	**Step**	
	1	User A writes a chat message
	2	User B reads a chat message
	3	User C reads a chat message
Conformance Criteria:	**Check**	
	1	TP_MSRP_9000_01 *ensure that {* *when { User A initiates the call to User B }* *then { UE_A sends the initial INVITE* *containing an offered session-description* *indicating a session of MSRP* *}* *}*
	2	TP_MSRP_9000_02 *ensure that {* *when { UE_A sends SEND_MSRP to UE_B }* *then { UE_A receives the INVITE200 OK response* *containing an offered session-description* *indicating a session of MSRP* *}* *}*
	3	TP_MSRP_9000_03 step 2,5 and 7 (SEND): *ensure that {* *when { UE_A sends SEND_MSRP to UE_B }* *then { UE_B receives the SEND_MSRP* *containing FromPath_header* *indicating the msrp_path from SDP attribute within SIP INVITE* *containing ToPath_header* *indicating the msrp_path from SDP attribute within SIP 200_response* *containing Content-Type_header* *indicating text/plain* *}* *}*
	4	TP_MSRP_9001_04 step 3,6 and 8 (200 OK SEND): *ensure that {* *when { UE_B receives SEND_MSRP from UE_A }* *then { UE_B sends the 200_response_MSRP* *containing FromPath_header* *indicating the msrp_path from SDP attribute within SIP INVITE* *containing ToPath_header* *indicating the msrp_path from SDP attribute within SIP 200_response* *}* *}*

Step	Direction								Message	Comment
	User A	UE A	AS/IMA		UE B	User B	UE C	User C		
1	→									User A writes a chat message
2		→							SEND	UE A sends SEND MSRP with content to IM SERVER
3		←							200 OK	IM SERVER responds with 200 OK to UE A
4			→		→				SEND	IM SERVER sends SEND MSRP with content to UE B
5			←		←				200 OK	UE responds with 200 OK to IM SERVER
6						→				User B reads a chat message
7			→		→		→		SEND	IM SERVER sends SEND MSRP with content to UE C
8			←		←		←		200 OK	UE C responds with 200 OK to IM SERVER
9							→			User C reads a chat message

5.4.3 Image transfer procedure via MSRP

Interoperability Test Description		
Identifier:	TD_MSRP_FILE_0001	
Summary:	User A transfers a file with SEND request to User B via MSRP and if endpoint receives a request it shall immediately generate a response and send it back.	
Configuration:		
SUT	UE_A and UE_B	
References	**Test Purpose**	**Specification Reference**
	TP_MSRP_9000_03	RFC 4975 [8], clauses 5.4 and 7.1 and RFC 5547 [11]
	TP_MSRP_9001_01	RFC 4975 [8], clause 7.2
Use Case ref.:	UC_MSRP_04	
Pre-test conditions:	• UE_A has_initiated_a_dialog_with UE_B	
Test Sequence:	**Step**	
	1	User A selects a file for sending
	2	User B opens received file
Conformance Criteria:	**Check**	
	1	TP_MSRP_9000_03 step 2 (SEND): *ensure that {* *when { UE_A sends SEND_MSRP to UE_B }* *then { UE_B receives the SEND_MSRP* *containing FromPath_header* *indicating the msrp_path from SDP attribute within SIP INVITE* *containing ToPath_header* *indicating the msrp_path from SDP attribute within SIP 200_response* *containing Content-Type_header* *indicating image/jpg* *}* *}*

Interoperability Test Description		
	2	TP_MSRP_9001_04 step 3 (200 OK SEND): *when { UE_B receives SEND_MSRP from UE_A }* *then { UE_B sends the 200_response_MSRP* *containing FromPath_header* *indicating the msrp_path from SDP attribute within SIP INVITE* *containing ToPath_header* *indicating the msrp_path from SDP attribute within SIP 200_response* *}* *}*

Step	Direction								Message	Comment
	User A	**UE A**					**UE B**	**User B**		
1		→								User A selects a picture
2			→		→		→		SEND (image)	UE A sends SEND MSRP with content to UE B
3			←		←		←		200 OK	UE B responds with 200 OK to UE A
4							→			User B views a picture

Annex A (normative): Zip file with TPLan code

The test purposes used in the present document have been originally generated in the TPLan text files in the archive file ts_102901V050101p0.zip which accompanies the present document.

Annex B (informative): Bibliography

ETSI TS 124 141 (V10.0.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Presence service using the IP Multimedia (IM) Core Network (CN) subsystem; Stage 3 (3GPP TS 24.141 Release 10)".

History

Document history		
V1.1.1	June 2011	Publication
V2.1.1	November 2011	Publication
V4.1.1	May 2012	Publication
V5.1.1	October 2013	Publication