

**IMS Network Testing (INT);  
IMS NNI Interoperability Test Specifications;  
IMS NNI interoperability test descriptions for RCS**

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Reference

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## Foreword

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

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# 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 Release 2 of the RCS Functional Description [8], the RCS Service Definition [9] and the Technical Realization [10] documents. 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 [7] *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. The latter requirements have been dealt with from a UE and conformance perspective in TS 134 229 [6].

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# 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 (V8.10.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3 (3GPP TS 24.229 version 8.10.0 Release 8)".
- [2] ETSI TS 186 011-1 (V3.1.1): "IMS Network Testing (INT); IMS NNI Interoperability Test Specifications; 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 134 229: "Universal Mobile Telecommunications System (UMTS); LTE; Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Part 1: Protocol conformance specification (3GPP TS 34.229-1 Release 8)".

- [7] ETSI TS 129 165: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS);LTE;Inter-IMS Network to Network Interface (NNI) (3GPP TS 29.165 version 8.4.0 Release 8)".
- [8] Rich Communication Suite Release 2: "Functional Description 1.1".
- [9] Rich Communication Suite Release 2: "Service Definition 1.1".
- [10] Rich Communication Suite Release 2: "Technical Realization 1.1".
- [11] ETSI TS 186 011-2 (V3.1.1): "IMS Network Testing (INT); IMS NNI Interoperability Test Specifications; Part 2: Test Description for IMS NNI Interoperability".
- [12] IETF RFC 5547: "A Session Description Protocol (SDP) Offer/Answer Mechanism to Enable File Transfer".

## 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.

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## 3 Abbreviations

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

3GPP	3 <sup>rd</sup> Generation Partnership Project
AS	(IMS) Application Server
CF	(Test) ConFiguration
CFW	Call FloW
CN	Core Network
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
MRFC	Multimedia Resource Function Controller
MRFP	Multimedia Resource Function Processor
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

## 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 (instant messaging, content sharing and presence) as defined in RCS release 2 [8], [9] and [10].*

### 4.2 Test Prerequisites

The test prerequisites as described in TS 186 011-2 [11], clause 4.2 apply.

### 4.3 Test Infrastructure

The test infrastructure as described in TS 186 011-2 [11], 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 [11], 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 Release 2

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 AS that acts as an intermediate for the user to provide Presence information to other users and other users to subscribe or get 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 and the delivery of history information.

#### 4.3.2.2.3 Node Configuration

The AS should be configured to support the pre-requisites outlined in TS 186 011-2 [11] clause 4.2. The test descriptions in the present document assume that an AS supports the use of the services Enhanced Address Book, Presence, Instant Messaging Content Sharing or Conference (see Rich Communication Suite Release 2 descriptions in [8], [9] and [10]). 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 [11] clause 4.3.4 apply.

## 4.4 Use Cases

In addition to the Use Cases in the present clause the Use Cases as described in TS 186 011-2 [11] clause 4.4 apply.

### 4.4.1 Ad-hoc Conferencing service

#### 4.4.1.1 Description

UE A registered on IMS network A initiates an ad-hoc conf call via CONF AS, connected over ISC interface to IMS core A, and subsequently invites UE B (registered in IMS B) to join the conf. This Use Case requires support for MRFC and MRFP functionalities on IMS\_A.

The test sequence when user A initiates an ad-hoc conference call and invites user B to join it, in an interworking scenario is:

Step	Action	CF_INT_CONF CALL
1	User A initiates an ad-hoc conference call	Step 1
2	User A is informed the Ad Hoc Conference Call is being set up	Step 4
3	User A is informed the Ad Hoc Conference Call is established	Step 9
4	User A invites user B to join the ad-hoc conference call	Step 12
5	User B is informed of incoming invitation from User A to join the Conference Call	Step 27
6	User A is notified that user B is being invited to join the call	Step 33
7	User B joins the conference	Step 41
8	User A is notified that user B has joined the conference	Step 45
9	User B leaves the conference	Step 48
10	User B is informed that the conference has ended	Step 55
11	User A is notified that user B has left the conference	Step 58

NOTE 1: The proposed test configuration shown in CF\_INT\_CONF\_CALL indicates CONF AS A (AS+MRFC+MRFP) resources in IMS A, hence the UC refers to UE\_A as conference initiator in IMS A and UE\_B, although the same UC applies alternatively for UE\_B as conference initiator in IMS B and UE\_A as participant in IMS A, which involves a CONF AS B connected to IMS B, not shown in the test configuration for simplicity purposes.

NOTE 2: For the purpose of IMS NNI conformance testing, the proposed test configuration refers to the ISC interface as an optional Point of Observation (PO), where the SIP signalling passing through it might be observed but not considered part of the conformance testing.

This proposal is consistent with the most common interoperability scenario where one vendor provides the complete solution for the conference service, integrated into a 3<sup>rd</sup> party IMS core via ISC interface.

## 4.4.1.2 UC\_RCS\_1: SIP Call Flow "Ad-hoc Conference call"

The expected call flow sequence is:

Step	Direction									Message	Comment
	U s e r A	U E A	U s e r B	U E B	I M S A	A S A	I M S B	A S B			
1		→									User A initiates an ad-hoc conference call
2					→					INVITE	UE_A sends INVITE to IMS_A with information for all commonly supported presence elements
3										100 Trying	IMS_A responds with a 100 Trying provisional response
4		←									User A is informed the Ad Hoc Conference Call is being set up
5										INVITE	IMS_A forwards INVITE to IMS_A AS
6										100 Trying	IMS_A AS responds with a 100 Trying provisional response
7										200 OK	IMS_A AS responds with a 200 OK to IMS_A, with isfocus parameter.
8										200 OK	IMS_A forwards the 200OK response to UE_A
9		←									User A is informed the Ad Hoc Conference Call is established
10										ACK	UE_A acknowledges the receipt of 200 OK for INVITE
11										ACK	IMS_A forwards the ACK to IMS_A AS
12		→									User A invites user B to join the ad-hoc conference call
13										REFER	UE_A sends REFER message to IMS_A, with Refer-To : <UE_B uri ;method=INVITE>
14										REFER	IMS_A forwards the REFER to IMS_A AS
15										202 Accepted	IMS_A AS responds with a 202 Accepted
16										202 Accepted	IMS_A forwards the 202 Accepted response to UE_A
17										NOTIFY	IMS_A AS sends a NOTIFY to IMS_A to inform the conference initiator the REFER message is being processed
18										NOTIFY	IMS_A forwards the NOTIFY to UE_A
19										200 OK	UE_A responds with 200 OK to IMS_A
20										200 OK	IMS_A forwards the 200 OK response to IMS_A AS
21										INVITE	IMS_A AS sends INVITE to UE_B with conference-factory URI (received in the REFER message from UE A)
22										100 Trying	IMS_A responds with a 100 Trying provisional response
23										INVITE	IMS_A forwards the INVITE to IMS_B
24										100 Trying	IMS_B responds with a 100 Trying provisional response
25										INVITE	IMS_B forwards the INVITE to UE_B
26										100 Trying	UE_B responds with a 100 Trying provisional response
27											User B is informed of incoming invitation from User A to join the Conference Call
28										180 Ringing	UE_B sends a 180 ringing to IMS_B
29										180 Ringing	IMS_B forwards the 180 ringing to IMS_A

Step	Direction									Message	Comment
	U s e r A	U E A	U s e r B	U E B	I M S A	A S A	I M S B	A S B			
30										180 Ringing	IMS_A forwards the 180 ringing to IMS_A AS
31										NOTIFY	Upon reception of 180 Ringing from UE_B, IMS_A AS sends NOTIFY with sipfrag: 180 Ringing to inform conference initiator that UE_B is being invited to join the conference
32										NOTIFY	IMS_A forwards the NOTIFY to UE_A
33											User A is notified that user B is being invited to join the call
34										200 OK	UE_A responds with 200 OK to IMS_A for NOTIFY
35										200 OK	IMS_A forwards the 200 OK response to IMS_A AS
36										200 OK	UE_B responds with 200 OK to IMS_B for INVITE
37										200 OK	IMS B forwards the 200 OK response to IMS A
38										200 OK	IMS A forwards the 200 OK response to IMS_A AS
39											User B joins the conference
40										ACK	UE_B acknowledges the 200 OK for INVITE
41										ACK	IMS B forwards the ACK to IMS A
42										ACK	IMS A forwards the ACK to IMS_A AS
43										NOTIFY	AS_A sends NOTIFY to UE_A to inform it has successfully joined the conference
44										NOTIFY	IMS_A forwards NOTIFY to UE_A
45											User A is alerted that user B has joined the conference
46										200 OK	UE_A sends 200 OK response for NOTIFY
47										200 OK	IMS_A forwards the 200 OK response to IMS_A AS
48											User B leaves the conference
49										BYE	UE_B sends BYE to IMS_B to leave the conference
50										BYE	IMS_B forwards the BYE to IMS_A
51										BYE	IMS_A forwards the BYE to IMS_A AS
52										200 OK	IMS_A AS releases resources for this conference caller and sends a 200 OK response for BYE
53										200 OK	IMS_A forwards the 200 OK response to IMS_B
54										200 OK	IMS_B forwards the 200 OK response to UE_B
55											User B is informed that the conference has ended
56										NOTIFY	AS_A sends NOTIFY to IMS_A to inform UE_A that UE_B has left the conference
57										NOTIFY	IMS_A forwards NOTIFY to UE_A
58											User A is notified that user B has left the conference
59										200 OK	UE_A sends a 200 OK response for NOTIFY
60										200 OK	IMS_A forwards the 200 OK response to IMS_A AS

## 4.4.2 Presence service

### 4.4.2.1 Watcher subscription to presence event notification

#### 4.4.2.1.1 Description

UE\_B is configured to receive notifications with watcher information. UE\_B publishes its presence 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
1	User B publishes presence information	Step 1	Step 1
2	User B is informed of its presence status update	Step 6	Step 12
3	User A subscribes to presence information from User B	Step 7	Step 13
4	User B receives an authorization request from User A to be informed of its own presence information	Step 31	Step 43
5	User B authorizes user A to be informed of its own presence information	Step 32	Step 44
6	User A is informed of user B presence information	Step 41	Step 53

#### 4.4.2.1.2 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	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
1												User B publishes presence 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
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 A subscribes to presence information from User B

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
14											SUBSCRIBE	UE_A sends SUBSCRIBE for "presence" event to IMS_A
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_A
24											NOTIFY	IMS_B AS sends NOTIFY to IBCF_B
25											NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
26											NOTIFY	IBCF_A forwards NOTIFY to IMS_A
27											NOTIFY	IMS_A forwards the NOTIFY to UE_A
28											200 OK	UE_A responds with a 200 OK to IMS_A
29											200 OK	IMS_A forwards the 200 OK to IBCF_A
30											200 OK	IBCF_A forwards the 200 OK to IBCF_B
31											200 OK	IBCF_B forwards the 200 OK response to IMS_B AS
32												SUBSCRIPTION triggers the AS to send a NOTIFY to UE_B indicating the change to the watcher information subscriber
33											NOTIFY	IMS_B AS sends NOTIFY to IMS_B to indicate UE_B the change to the watcher information subscriber
34											NOTIFY	IMS_B forwards the NOTIFY to IBCF_B
35											NOTIFY	IBCF_B forwards the NOTIFY to IBCF_A
36											NOTIFY	IBCF_A forwards the NOTIFY to IMS_A
37											NOTIFY	IMS_A forwards the NOTIFY to UE_B
38											200 OK	UE_B responds with a 200 OK to IMS_A
39											200 OK	IMS_A forwards the 200 OK response to IBCF_A
40											200 OK	IBCF_A forwards the 200 OK response to IBCF_B
41												IBCF_B forwards the 200 OK response to IMS_B

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
42												200 OK	IMS_B forwards the 200 OK response to IMS_B AS
43													User B receives an authorization request from User A to see its own presence information
44													User B authorizes user A to be informed of its own presence information
45												NOTIFY	IMS_B AS sends NOTIFY to IBCF_B
46												NOTIFY	IBCF_B sends NOTIFY to IBCF_A
47												NOTIFY	IBCF_A forwards 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 IBCF_A
51												200 OK	IBCF_A forwards the 200 OK response to IBCF_B
52												200 OK	IBCF_B forwards the 200 OK response to IMS_B AS
53													User A is informed of user B presence information
54												NOTIFY	IMS_B AS sends NOTIFY to IMS_B to indicate UE_B that subscription has been authorized
55												NOTIFY	IMS_B forwards the NOTIFY to IBCF_B
56												NOTIFY	IBCF_B forwards the NOTIFY to IBCF_A
57												NOTIFY	IBCF_A forwards the NOTIFY to IMS_A
58												NOTIFY	IMS_A forwards the NOTIFY to UE_B
59												200 OK	UE_B 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
63												200 OK	IMS_B forwards the 200 OK response to IMS_B AS
64													User A sees user B presence information

### 4.4.2.1.3 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	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
1													User B publishes presence information
2													PUBLISH UE_B sends PUBLISH with information for all commonly supported presence 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 IBCF_B
6													User B is informed of its presence status update
7													User A subscribes to presence information from User B
8													SUBSCRIBE UE_A sends SUBSCRIBE for "presence" event to IMS_A
9													SUBSCRIBE IMS_A forwards the SUBSCRIBE to IBCF_A
10													SUBSCRIBE IBCF_A forwards the SUBSCRIBE to IBCF_B
11													SUBSCRIBE IBCF_B forwards the SUBSCRIBE to IMS_B
12													SUBSCRIBE IMS_B forwards the SUBSCRIBE to IMS_B AS (PS)
13													200 OK IMS_B AS responds with a 200 OK to IMS_B
14													200 OK IMS_B forwards the 200 OK response to IBCF_B
15													200 OK IBCF_B forwards the 200 OK response to IBCF_A
16													200 OK IBCF_A forwards the 200 OK response to IMS_A
17													200 OK IMS_A forwards the 200 OK response to UE_A
18													NOTIFY IMS_B AS sends NOTIFY to IBCF_B
19													NOTIFY IBCF_B forwards NOTIFY to IBCF_A
20													NOTIFY IBCF_A forwards NOTIFY to IMS_A
21													NOTIFY IMS_A forwards the NOTIFY to UE_A
22													200 OK UE_A responds with a 200 OK to IMS_A
23													200 OK IMS_A forwards the 200 OK to IBCF_A
24													200 OK IBCF_A forwards the 200 OK to IBCF_B
25													200 OK IBCF_B forwards the 200 OK response to IMS_B AS
26													SUBSCRIPTION triggers the AS to send a NOTIFY to UE_B indicating the change to the watcher information subscriber



Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
27											←	NOTIFY	IMS_B AS sends NOTIFY to IMS_B to indicate UE_B the change to the watcher information subscriber
28											→	NOTIFY	IMS_B forwards the NOTIFY to UE_B
29											←	200 OK	UE_B responds with a 200 OK to IMS_B
30											→	200 OK	IMS_B forwards the 200 OK response to IMS_B AS
31													User B receives an authorization request from User A to see its own presence information
32													User B authorizes user A to be informed of its own presence information
33											←	NOTIFY	IMS_B AS sends NOTIFY to IBCF_B
34											←	NOTIFY	IBCF_B sends NOTIFY to IBCF_A
35											←	NOTIFY	IBCF_A forwards NOTIFY to IMS_A
36											←	NOTIFY	IMS_A forwards the NOTIFY to UE_A
37											→	200 OK	UE_A responds with a 200 OK to IMS_A
38											→	200 OK	IMS_A forwards the 200 OK response to IBCF_A
39											→	200 OK	IBCF_A forwards the 200 OK response to IBCF_B
40											→	200 OK	IBCF_B forwards the 200 OK response to IMS_B AS
41													User A is informed of user B presence information
42											←	NOTIFY	IMS_B AS sends NOTIFY to IMS_B to indicate UE_B that subscription has been authorized
43											→	NOTIFY	IMS_B forwards the NOTIFY to UE_B
44											←	200 OK	UE_B responds with a 200 OK to IMS_B
45											→	200 OK	IMS_B forwards the 200 OK response to IMS_B AS
46													User A sees user B presence information

#### 4.4.2.2 Watcher subscription to resource list

##### 4.4.2.2.1 Description

UE\_B is configured to receive notifications with watcher information. UE\_B publishes its presence information. User B has authorized User A to see its presence information. User A is authorized to use resource lists. 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 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
1	User B publishes presence 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 containing User B SIP URI	Step 7	Step 13
4	User A is informed of user B presence information	Step 42	Step 48

#### 4.4.2.2.2 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	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
1													User B publishes presence 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
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 A subscribes to resource list
14												SUBSCRIBE	UE_A sends SUBSCRIBE for "presence" event to IMS_A indicating support to "eventlist" to a resource list SIP URI
15												SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IMS_A AS (RLS)
16													RLS performs authorization checks to ensure that User A is authorized to use resource lists
17												200 OK	IMS_A AS responds with a 200 OK to IMS_A
18												200 OK	IMS_A forwards the 200 OK response to UE_A
19												NOTIFY	IMS_A AS sends NOTIFY to IMS_A
20												NOTIFY	IMS_A forwards the NOTIFY to UE_A
21												200 OK	UE_A responds with a 200 OK to IMS_A

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
22			←								200 OK	IMS_A forwards the 200 OK response to IMS_A AS
23												RLS resolves watcher resource's address and subscribes for presence event notification for all the presentities represented by the resource list SIP URI
24			→								SUBSCRIBE	IMS_A AS (RLS) sends SUBSCRIBE for "presence" event to IMS_A
25				→							SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IBCF_A
26					→						SUBSCRIBE	IBCF_A forwards the SUBSCRIBE to IBCF_B
27						→					SUBSCRIBE	IBCF_B forwards the SUBSCRIBE to IMS_B
28							→				SUBSCRIBE	IMS_B forwards the SUBSCRIBE to IMS_B AS (PS)
29												PS performs authorization checks on the originator to ensure it is allowed to watch the presentity
30								←			200 OK	IMS_B AS (PS) responds with a 200 OK to IMS_B
31									←		200 OK	IMS_B forwards the 200 OK response to IBCF_B
32										←	200 OK	IBCF_B forwards the 200 OK response to IBCF_A
33											200 OK	IBCF_A forwards the 200 OK response to IMS_A
34			←								200 OK	IMS_A forwards the 200 OK response to IMS_A AS (RLS)
35										←	NOTIFY	IMS_B AS sends a NOTIFY to IBCF_B with the presence information of UE_B
36											NOTIFY	IBCF_B forwards the NOTIFY to IBCF_A
37												IBCF_A forwards the NOTIFY to IMS_A
38			←								NOTIFY	IMS_A forwards the NOTIFY to IMS_A AS (RLS)
39			→								200 OK	IMS_A AS responds with a 200 OK to IMS_A
40				→							200 OK	IMS_A forwards the 200 OK response to IBCF_A
41					→						200 OK	IBCF_A forwards the 200 OK response to IBCF_B
42											200 OK	IBCF_B forwards the 200 OK response to IMS_B AS
43												RLS notifies with presence information for all the presentities represented by the resource list SIP URI
44			→								NOTIFY	IMS_A AS sends NOTIFY to IMS_A
45			←								NOTIFY	IMS_A forwards the NOTIFY to UE_A
46			→								200 OK	UE_A responds with a 200 OK to IMS_A

Step	Direction										Message	Comment
	User A	UE A	AS/IMS A	IMS A	IBCFA	IBCFB	IMS B	AS/IMB	UE B	User B		
47			←								200 OK	IMS_A forwards the 200 OK response to IMS_A AS
48												User A sees user B presence information

#### 4.4.2.2.3 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	UE A	AS/IMS A	IMS A	IBCFA	IBCFB	IMS B	AS/IMB	UE B	User B		
1												User B publishes presence information
2							←				PUBLISH	UE_B sends PUBLISH with information for all commonly supported presence 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 A subscribes to resource list
8			→								SUBSCRIBE	UE_A sends SUBSCRIBE for "presence" event to IMS_A indicating support to "eventlist" to a resource list SIP URI
9			←								SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IMS_A AS (RLS)
10												RLS performs authorization checks to ensure that User A is authorized to use resource lists
11			→								200 OK	IMS_A AS responds with a 200 OK to IMS_A
12		←									200 OK	IMS_A forwards the 200 OK response to UE_A
13			→								NOTIFY	IMS_A AS sends NOTIFY to IMS_A
14		←									NOTIFY	IMS_A forwards the NOTIFY to UE_A
15			→								200 OK	UE_A responds with a 200 OK to IMS_A
16			←								200 OK	IMS_A forwards the 200 OK response to IMS_A AS
17												RLS resolves watcher resource's address and subscribes for presence event notification for all the presentities represented by the resource list SIP URI
18			→								SUBSCRIBE	IMS_A AS (RLS) sends SUBSCRIBE for "presence" event to IMS_A

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
19				→							SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IBCF_A
20					→						SUBSCRIBE	IBCF_A forwards the SUBSCRIBE to IBCF_B
21						→					SUBSCRIBE	IBCF_B forwards the SUBSCRIBE to IMS_B
22							→				SUBSCRIBE	IMS_B forwards the SUBSCRIBE to IMS_B AS (PS)
23												PS performs authorization checks on the originator to ensure it is allowed to watch the presentity
24								←			200 OK	IMS_B AS (PS) responds with a 200 OK to IMS_B
25									←		200 OK	IMS_B forwards the 200 OK response to IBCF_B
26										←	200 OK	IBCF_B forwards the 200 OK response to IBCF_A
27											200 OK	IBCF_A forwards the 200 OK response to IMS_A
28				←							200 OK	IMS_A forwards the 200 OK response to IMS_A AS (RLS)
29											NOTIFY	IMS_B AS sends a NOTIFY to IBCF_B with the presence information of UE_B
30											NOTIFY	IBCF_B forwards the NOTIFY to IBCF_A
31												IBCF_A forwards the NOTIFY to IMS_A
32				←							NOTIFY	IMS_A forwards the NOTIFY to IMS_A AS (RLS)
33				→							200 OK	IMS_A AS responds with a 200 OK to IMS_A
34				→							200 OK	IMS_A forwards the 200 OK response to IBCF_A
35					→						200 OK	IBCF_A forwards the 200 OK response to IBCF_B
36						→					200 OK	IBCF_B forwards the 200 OK response to IMS_B AS
37												RLS notifies with presence information for all the presentities represented by the resource list SIP URI
38				→							NOTIFY	IMS_A AS sends NOTIFY to IMS_A
39				←							NOTIFY	IMS_A forwards the NOTIFY to UE_A
40				→							200 OK	UE_A responds with a 200 OK to IMS_A
41				←							200 OK	IMS_A forwards the 200 OK response to IMS_A AS
42												User A sees user B presence information

## 4.4.3 Enhanced Messaging

### 4.4.3.1 Description

Enhanced messaging session assumes the possibility for users to receive the following types of services:

- Chat 1-to-1 (including peer-to-peer chat).
- Chat 1-to-many (Ad-hoc only).
- File transfer (only one-to-one and one file per file transfer session).

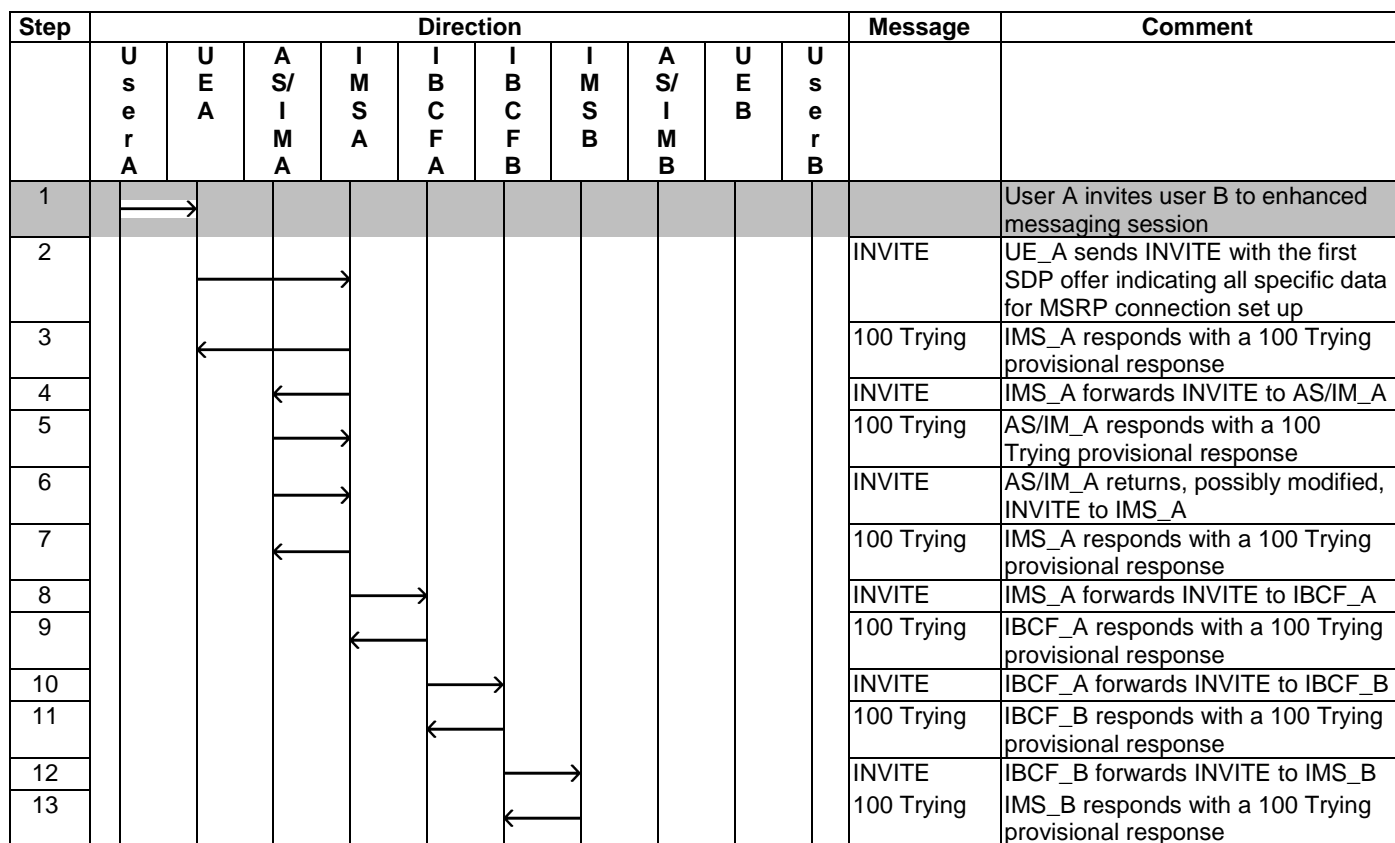
### 4.4.3.2 Enhanced Messaging - immediate handling

Following there are the expected common call flow sequences for enhanced messaging when the incoming one-to-one IM session requests are handled immediately by the RCS client without asking the user's acceptance.

#### 4.4.3.2.1 UC\_RCS\_4\_I: SIP message flow for Enhanced Messaging - immediate handling 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 invites user B to enhanced messaging session	Step 1
2	User B is informed of incoming enhanced messaging session	Step 20
3	Users perform enhanced messaging	Step 39
4A	User A ends the enhanced messaging session	Step 40A
4B	User B ends the enhanced messaging session	Step 40B
5A	User B is informed that enhanced messaging session has ended	Step 50A
5B	User A is informed that enhanced messaging session has ended	Step 50B
6A	User A is informed that enhanced messaging session has ended	Step 60A
6B	User B is informed that enhanced messaging session has ended	Step 60B



Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
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 enhanced messaging session
21											200 OK	UE_B responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and informs A-side with specific data for 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											ACK	UE_A acknowledges the receipt of 200 OK for INVITE
31											ACK	IMS_A forwards ACK to AS/IM_A
32											ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
33											ACK	IMS_A forwards ACK to IBCF_A
34											ACK	IBCF_A forwards ACK to IBCF_B
35											ACK	IBCF_B forwards ACK to IMS_B
36											ACK	IMS_B forwards ACK to AS/IM_B
37											ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
38											ACK	IMS_B forwards ACK to UE_B
39												Users perform enhanced messaging
40A												User A ends the enhanced messaging session
41A											BYE	UE_A releases the enhanced messaging session with BYE
42A											BYE	IMS_A forwards BYE to AS/IM_A
43A											BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
44A											BYE	IMS_A forwards BYE to IBCF_A
45A											BYE	IBCF_A forwards BYE to IBCF_B
46A											BYE	IBCF_B forwards BYE to IMS_B
47A											BYE	IMS_B forwards BYE to AS/IM_B

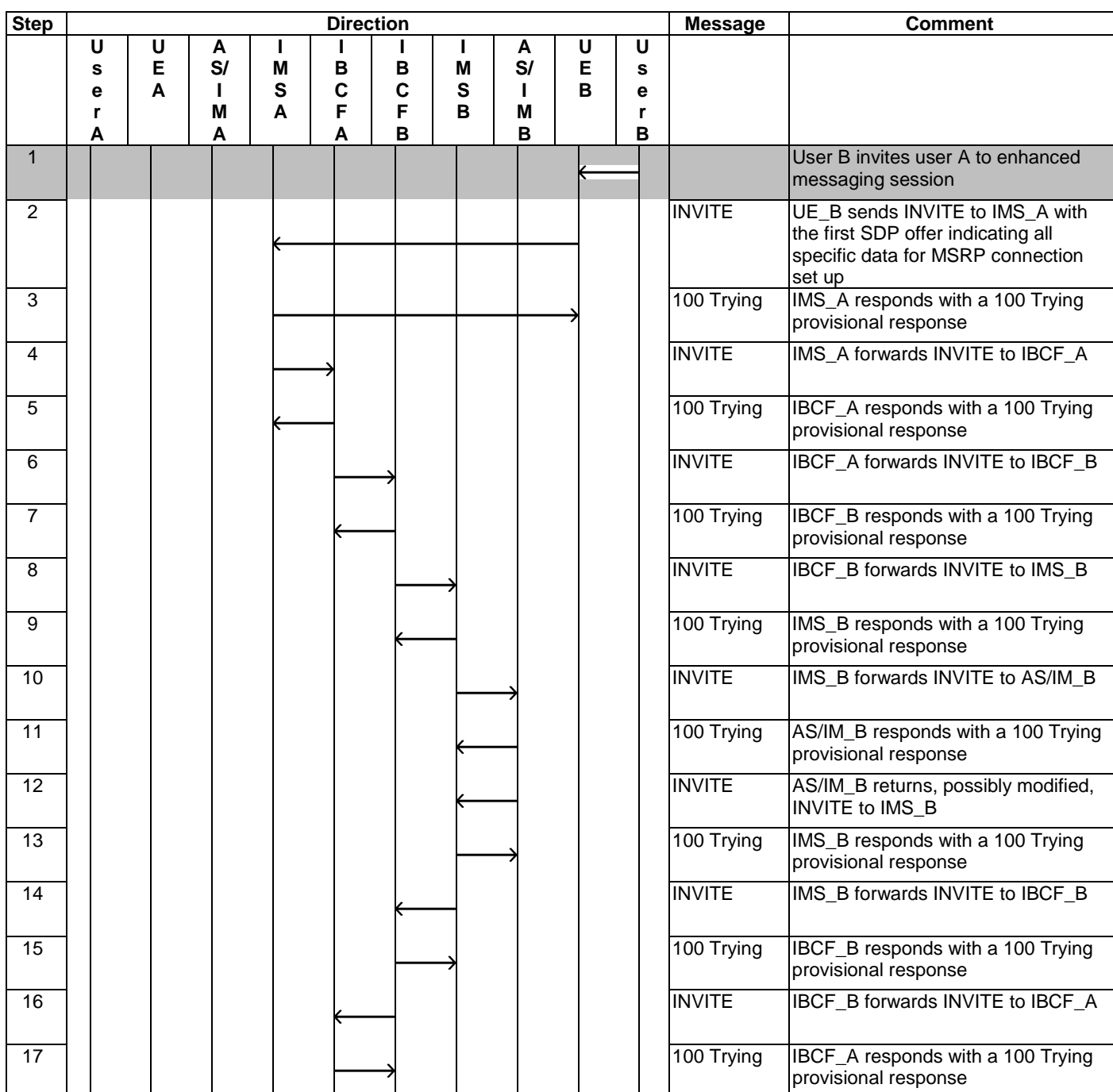
Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
48A												BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
49A												BYE	IMS_B forwards BYE to UE_B
50A													User B is informed that enhanced messaging session has ended
51A												200 OK	UE_B sends 200 OK for BYE
52A												200 OK	IMS_B forwards 200 OK response to AS/IM_B
53A												200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
54A												200 OK	IMS_B forwards 200 OK response to IBCF_B
55A												200 OK	IBCF_B forwards 200 OK response to IBCF_A
56A												200 OK	IBCF_A forwards 200 OK response to IMS_A
57A												200 OK	IMS_A forwards 200 OK response to AS/IM_A
58A												200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
59A												200 OK	IMS_A forwards 200 OK response to UE_A
60A													User A is informed that enhanced messaging session has ended
40B													User B ends the enhanced messaging session
41B												BYE	UE_B releases the enhanced messaging session with BYE
42B												BYE	IMS_B forwards BYE to AS/IM_B
43B												BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
44B												BYE	IMS_B forwards BYE to IBCF_B
45B												BYE	IBCF_B forwards BYE to IBCF_A
46B												BYE	IBCF_A forwards BYE to IMS_A
47B												BYE	IMS_A forwards BYE to AS/IM_A
48B												BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
49B												BYE	IMS_A forwards BYE to UE_A
50B													User A is informed that enhanced messaging session has ended
51B												200 OK	UE_A sends 200 OK for BYE
52B												200 OK	IMS_A forwards 200 OK response to AS/IM_A
53B												200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
54B												200 OK	IMS_A forwards 200 OK response to IBCF_A
55B												200 OK	IBCF_A forwards 200 OK response to IBCF_B
56B												200 OK	IBCF_B forwards 200 OK response to IMS_B
57B												200 OK	IMS_B forwards 200 OK response to AS/IM_B
58B												200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
59B												200 OK	IMS_B forwards 200 OK response to UE_B
60B													User B is informed that enhanced messaging session has ended



4.4.3.2.2 UC\_RCS\_4\_R: SIP message flow for Enhanced Messaging - immediate handling 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 invites user A to session	Step 1
2	User A is informed of incoming enhanced messaging session	Step 26
3	Users perform enhanced messaging	Step 51
4A	User B ends the enhanced messaging session	Step 52A
4B	User A ends the enhanced messaging session	Step 52B
5A	User A is informed that enhanced messaging session has ended	Step 65A
5B	User B is informed that enhanced messaging session has ended	Step 65B
6A	User B is informed that enhanced messaging session has ended	Step 78A
6B	User A is informed that enhanced messaging session has ended	Step 78B



Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
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 enhanced messaging session
27		→									200 OK	UE_A 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
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		←									ACK	UE_B acknowledges the receipt of 200 OK for INVITE
40		→									ACK	IMS_A forwards ACK to IBCF_A
41		→									ACK	IBCF_A forwards ACK to IBCF_B

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
42												ACK	IBCF_B forwards ACK to IMS_B
43												ACK	IMS_B forwards ACK to AS/IM_B
44												ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
45												ACK	IMS_B forwards ACK to IBCF_B
46												ACK	IBCF_B forwards ACK to IBCF_A
47												ACK	IBCF_A forwards ACK to IMS_A
48												ACK	IMS_A forwards ACK to AS/IM_A
49												ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
50												ACK	IMS_A forwards ACK to UE_A
51													Users perform enhanced messaging
52A													User B ends the enhanced messaging session
53A												BYE	UE_B releases the enhanced messaging session with BYE
54A												BYE	IMS_A forwards BYE to IBCF_A
55A												BYE	IBCF_A forwards BYE to IBCF_B
56A												BYE	IBCF_B forwards BYE to IMS_B
57A												BYE	IMS_B forwards BYE to AS/IM_B
58A												BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
59A												BYE	IMS_B forwards BYE to IBCF_B
60A												BYE	IBCF_B forwards BYE to IBCF_A
61A												BYE	IBCF_A forwards BYE to IMS_A
62A												BYE	IMS_A forwards BYE to AS/IM_A
63A												BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
64A												BYE	IMS_A forwards BYE to UE_A
65A													User A is informed that enhanced messaging session has ended
66A												200 OK	UE_A sends 200 OK for BYE

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
67A			←									200 OK	IMS_A forwards 200 OK response to AS/IM_A
68A			→									200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
69A				→								200 OK	IMS_A forwards 200 OK response to IBCF_A
70A					→							200 OK	IBCF_A forwards 200 OK response to IBCF_B
71A						→						200 OK	IBCF_B forwards 200 OK response to IMS_B
72A							→					200 OK	IMS_B forwards 200 OK response to AS/IM_B
73A								←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
74A								←				200 OK	IMS_B forwards 200 OK response to IBCF_B
75A								←				200 OK	IBCF_B forwards 200 OK response to IBCF_A
76A								←				200 OK	IBCF_A forwards 200 OK response to IMS_A
77A									→			200 OK	IMS_A forwards 200 OK response to UE_B
78A										⇒			User B is informed that enhanced messaging session has ended
52B A	⇒												User A ends the enhanced messaging session
53B		→										BYE	UE_A releases the enhanced messaging session with BYE
54B			←									BYE	IMS_A forwards BYE to AS/IM_A
55B			→									BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
56B				→								BYE	IMS_A forwards BYE to IBCF_A
57B					→							BYE	IBCF_A forwards BYE to IBCF_B
58B						→						BYE	IBCF_B forwards BYE to IMS_B
59B							→					BYE	IMS_B forwards BYE to AS/IM_B
60B								←				BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
61B								←				BYE	IMS_B forwards BYE to IBCF_B
62B								←				BYE	IBCF_B forwards BYE to IBCF_A
63B								←				BYE	IBCF_A forwards BYE to IMS_A
64B									→			BYE	IMS_A forwards BYE to UE_B

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
65B												User B is informed that enhanced messaging session has ended
66B											200 OK	UE_B sends 200 OK for BYE
67B											200 OK	IMS_A forwards 200 OK response to IBCF_A
68B											200 OK	IBCF_A forwards 200 OK response to IBCF_B
69B											200 OK	IBCF_B forwards 200 OK response to IMS_B
70B											200 OK	IMS_B forwards 200 OK response to AS/IM_B
71B											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
72B											200 OK	IMS_B forwards 200 OK response to IBCF_B
73B											200 OK	IBCF_B forwards 200 OK response to IBCF_A
74B											200 OK	IBCF_A forwards 200 OK response to IMS_A
75B											200 OK	IMS_A forwards 200 OK response to AS/IM_A
76B											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
77B											200 OK	IMS_A forwards 200 OK response to UE_A
78B												User A is informed that enhanced messaging session has ended

#### 4.4.3.3 Enhanced Messaging - user acceptance

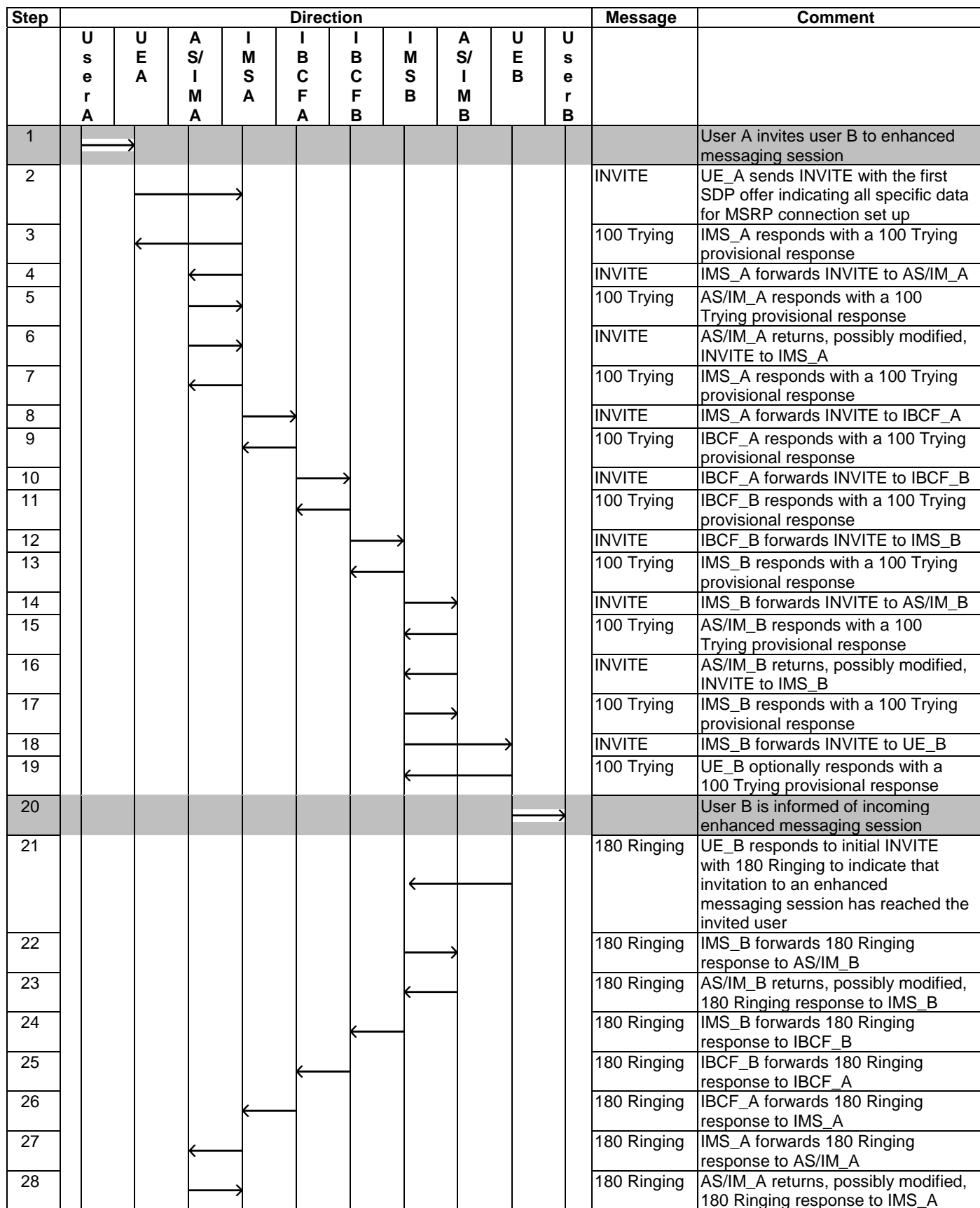
Following there are the expected common call flow sequences for enhanced messaging when the incoming one-to-one IM session requests are not handled immediately by the RCS client. The user has to explicitly accept the incoming request.

##### 4.4.3.3.1 UC\_RCS\_5\_I: SIP message flow for Enhanced Messaging - user acceptance 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 invites user B to enhanced messaging session	Step 1
2	User B is informed of incoming enhanced messaging session	Step 20
3	User A is informed that invitation to an enhanced messaging session has reached user B	Step 30
4	User B accepts the invitation to an enhanced messaging session	Step 31
5	Users perform enhanced messaging	Step 50
6A	User A ends the enhanced messaging session	Step 51A
6B	User B ends the enhanced messaging session	Step 51B
7A	User B is informed that enhanced messaging session has ended	Step 61A
7B	User A is informed that enhanced messaging session has ended	Step 61B

Step	Action	CF_INT_AS
8A	User A is informed that enhanced messaging session has ended	Step 71A
8B	User B is informed that enhanced messaging session has ended	Step 71B



Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
29		←									180 Ringing	IMS_A forwards 180 Ringing response to UE_A
30	←											User A is informed that invitation to an enhanced messaging session has reached user B
31										←		User B accepts the invitation to an enhanced messaging session
32									←		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
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 AS/IM_A
39									→		200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
40									←		200 OK	IMS_A forwards 200 OK response to UE_A
41									→		ACK	UE_A acknowledges the receipt of 200 OK for INVITE
42									←		ACK	IMS_A forwards ACK to AS/IM_A
43									→		ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
44									→		ACK	IMS_A forwards ACK to IBCF_A
45									→		ACK	IBCF_A forwards ACK to IBCF_B
46									→		ACK	IBCF_B forwards ACK to IMS_B
47									→		ACK	IMS_B forwards ACK to AS/IM_B
48									←		ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
49									→		ACK	IMS_B forwards ACK to UE_B
50	←									→		Users perform enhanced messaging
51A	→											User A ends the enhanced messaging session
52A									→		BYE	UE_A releases the enhanced messaging session with BYE
53A									←		BYE	IMS_A forwards BYE to AS/IM_A
54A									→		BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
55A									→		BYE	IMS_A forwards BYE to IBCF_A
56A									→		BYE	IBCF_A forwards BYE to IBCF_B
57A									→		BYE	IBCF_B forwards BYE to IMS_B
58A									→		BYE	IMS_B forwards BYE to AS/IM_B
59A									←		BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
60A									→		BYE	IMS_B forwards BYE to UE_B
61A										→		User B is informed that enhanced messaging session has ended
62A									←		200 OK	UE_B sends 200 OK for BYE

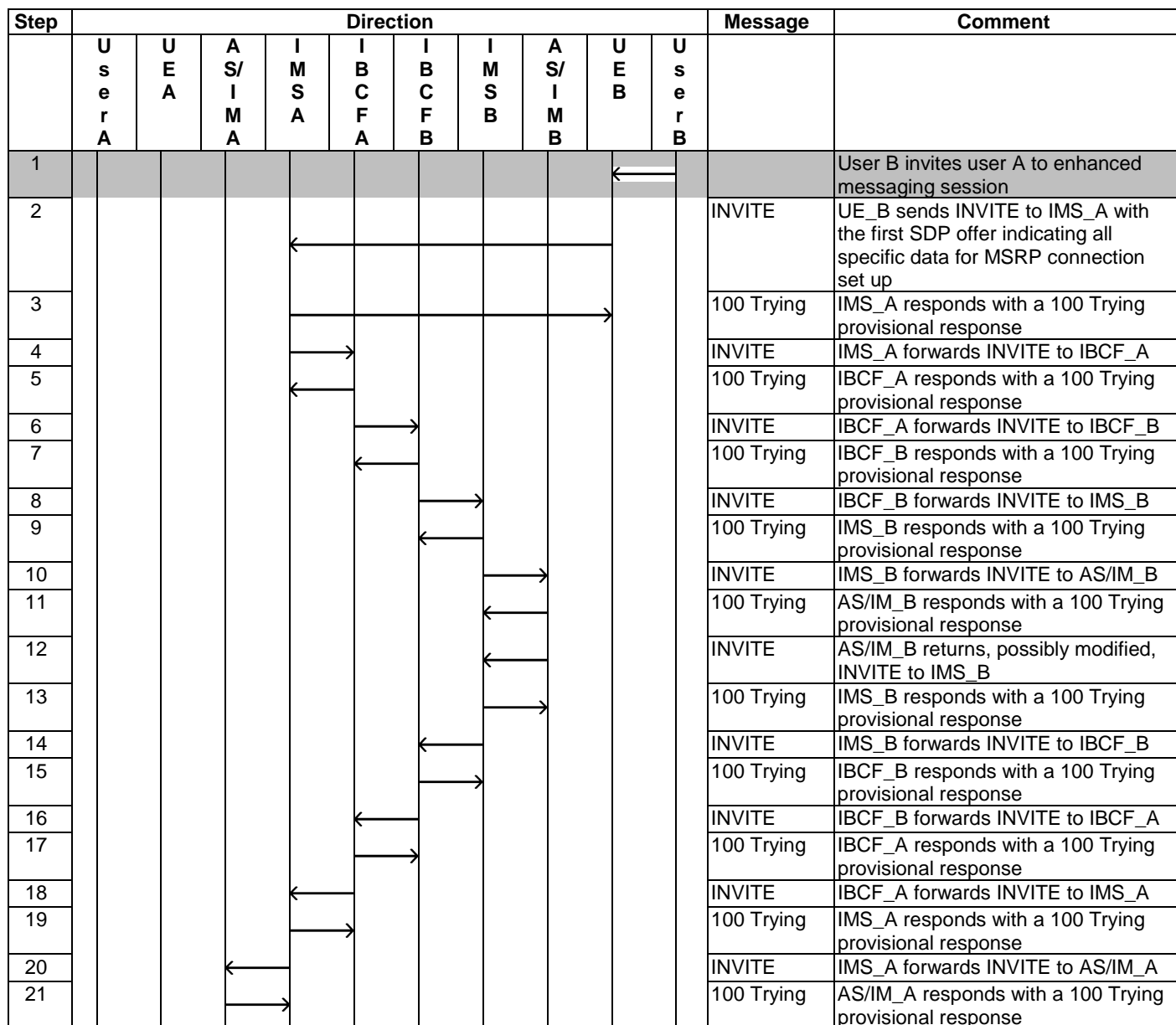
Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
63A												200 OK	IMS_B forwards 200 OK response to AS/IM_B
64A												200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
65A												200 OK	IMS_B forwards 200 OK response to IBCF_B
66A												200 OK	IBCF_B forwards 200 OK response to IBCF_A
67A												200 OK	IBCF_A forwards 200 OK response to IMS_A
68A												200 OK	IMS_A forwards 200 OK response to AS/IM_A
69A												200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
70A												200 OK	IMS_A forwards 200 OK response to UE_A
71A													User A is informed that enhanced messaging session has ended
51B													User B ends the enhanced messaging session
52B												BYE	UE_B releases the enhanced messaging session with BYE
53B												BYE	IMS_B forwards BYE to AS/IM_B
54B												BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
55B												BYE	IMS_B forwards BYE to IBCF_B
56B												BYE	IBCF_B forwards BYE to IBCF_A
57B												BYE	IBCF_A forwards BYE to IMS_A
58B												BYE	IMS_A forwards BYE to AS/IM_A
59B												BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
60B												BYE	IMS_A forwards BYE to UE_A
61B													User A is informed that enhanced messaging session has ended
62B												200 OK	UE_A sends 200 OK for BYE
63B												200 OK	IMS_A forwards 200 OK response to AS/IM_A
64B												200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
65B												200 OK	IMS_A forwards 200 OK response to IBCF_A
66B												200 OK	IBCF_A forwards 200 OK response to IBCF_B
67B												200 OK	IBCF_B forwards 200 OK response to IMS_B
68B												200 OK	IMS_B forwards 200 OK response to AS/IM_B
69B												200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
70B												200 OK	IMS_B forwards 200 OK response to UE_B
71B													User B is informed that enhanced messaging session has ended



#### 4.4.3.3.2 UC\_RCS\_5\_R: SIP message flow for Enhanced Messaging - user acceptance 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 invites user A to enhanced messaging session	Step 1
2	User A is informed of incoming enhanced messaging session	Step 26
3	User B is informed that invitation to an enhanced messaging session has reached user A	Step 39
4	User A accepts the invitation to an enhanced messaging session	Step 40
5	Users perform enhanced messaging	Step 65
6A	User A ends the enhanced messaging session	Step 66A
6B	User B ends the enhanced messaging session	Step 66B
7A	User B is informed that enhanced messaging session has ended	Step 79A
7B	User A is informed that enhanced messaging session has ended	Step 79B
8A	User A is informed that enhanced messaging session has ended	Step 92A
8B	User B is informed that enhanced messaging session has ended	Step 92B



Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r 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 enhanced messaging session
27		→									180 Ringing	UE_A responds to initial INVITE with 180 Ringing to indicate that invitation to an enhanced messaging 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									→			User B is informed that invitation to an enhanced messaging session has reached user A
40	→											User A accepts the invitation to an enhanced messaging session
41		→									200 OK	UE_A 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
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 IBCF_B

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
50											200 OK	IBCF_B forwards 200 OK response to IBCF_A
51											200 OK	IBCF_A forwards 200 OK response to IMS_A
52											200 OK	IMS_A forwards 200 OK response to UE_B
53											ACK	UE_B acknowledges the receipt of 200 OK for INVITE
54											ACK	IMS_A forwards ACK to IBCF_A
55											ACK	IBCF_A forwards ACK to IBCF_B
56											ACK	IBCF_B forwards ACK to IMS_B
57											ACK	IMS_B forwards ACK to AS/IM_B
58											ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
59											ACK	IMS_B forwards ACK to IBCF_B
60											ACK	IBCF_B forwards ACK to IBCF_A
61											ACK	IBCF_A forwards ACK to IMS_A
62											ACK	IMS_A forwards ACK to AS/IM_A
63											ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
64											ACK	IMS_A forwards ACK to UE_A
65												Users perform enhanced messaging
66A												User B ends the enhanced messaging session
67A											BYE	UE_B releases the enhanced messaging session with BYE
68A											BYE	IMS_A forwards BYE to IBCF_A
69A											BYE	IBCF_A forwards BYE to IBCF_B
70A											BYE	IBCF_B forwards BYE to IMS_B
71A											BYE	IMS_B forwards BYE to AS/IM_B
72A											BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
73A											BYE	IMS_B forwards BYE to IBCF_B
74A											BYE	IBCF_B forwards BYE to IBCF_A
75A											BYE	IBCF_A forwards BYE to IMS_A
76A											BYE	IMS_A forwards BYE to AS/IM_A
77A											BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
78A											BYE	IMS_A forwards BYE to UE_A
79A												User A is informed that enhanced messaging session has ended
80A											200 OK	UE_A sends 200 OK for BYE
81A											200 OK	IMS_A forwards 200 OK response to AS/IM_A
82A											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
83A											200 OK	IMS_A forwards 200 OK response to IBCF_A
84A											200 OK	IBCF_A forwards 200 OK response to IBCF_B
85A											200 OK	IBCF_B forwards 200 OK response to IMS_B
86A											200 OK	IMS_B forwards 200 OK response to AS/IM_B
87A											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
88A											200 OK	IMS_B forwards 200 OK response to IBCF_B

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
89A						←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
90A					←							200 OK	IBCF_A forwards 200 OK response to IMS_A
91A										→		200 OK	IMS_A forwards 200 OK response to UE_B
92A											⇒		User B is informed that enhanced messaging session has ended
66B	⇒												User A ends the enhanced messaging session
67B			→									BYE	UE_A releases the enhanced messaging session with BYE
68B			←									BYE	IMS_A forwards BYE to AS/IM_A
69B			→									BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
70B			→									BYE	IMS_A forwards BYE to IBCF_A
71B					→							BYE	IBCF_A forwards BYE to IBCF_B
72B						→						BYE	IBCF_B forwards BYE to IMS_B
73B							→					BYE	IMS_B forwards BYE to AS/IM_B
74B								←				BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
75B						←						BYE	IMS_B forwards BYE to IBCF_B
76B					←							BYE	IBCF_B forwards BYE to IBCF_A
77B					←							BYE	IBCF_A forwards BYE to IMS_A
78B										→		BYE	IMS_A forwards BYE to UE_B
79B											⇒		User B is informed that enhanced messaging session has ended
80B					←							200 OK	UE_B sends 200 OK for BYE
81B					→							200 OK	IMS_A forwards 200 OK response to IBCF_A
82B					→							200 OK	IBCF_A forwards 200 OK response to IBCF_B
83B						→						200 OK	IBCF_B forwards 200 OK response to IMS_B
84B							→					200 OK	IMS_B forwards 200 OK response to AS/IM_B
85B								←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
86B						←						200 OK	IMS_B forwards 200 OK response to IBCF_B
87B					←							200 OK	IBCF_B forwards 200 OK response to IBCF_A
88B					←							200 OK	IBCF_A forwards 200 OK response to IMS_A
89B			←									200 OK	IMS_A forwards 200 OK response to AS/IM_A
90B			→									200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
91B			←									200 OK	IMS_A forwards 200 OK response to UE_A
92B	←												User A is informed that enhanced messaging session has ended

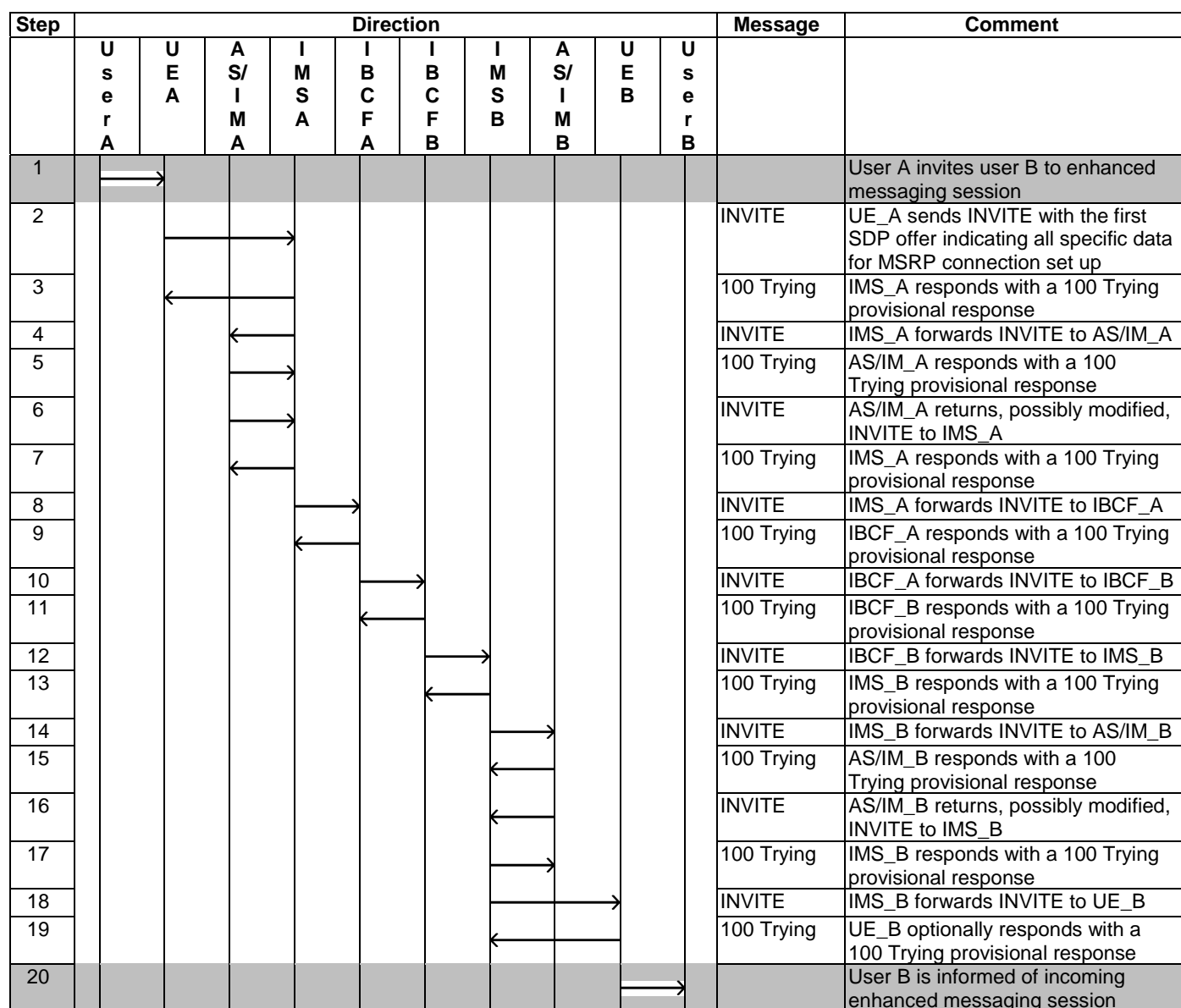
#### 4.4.3.4 Enhanced Messaging - user rejection

Following there are the expected common call flow sequences for enhanced messaging when an incoming one-to-one IM session request is rejected by the RCS client.

##### 4.4.3.4.1 UC\_RCS\_6\_I: SIP message flow for Enhanced Messaging - user rejection 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 invites user B to enhanced messaging session	Step 1
2	User B is informed of incoming enhanced messaging session	Step 20
3	User A is informed that invitation to an enhanced messaging session has reached user B	Step 30
4	User B rejects the invitation to an enhanced messaging session	Step 31
5	User A is informed that enhanced messaging session was rejected by user B	Step 41
6	User B is informed that enhanced messaging session is terminated	Step 51



Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
21											←	180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that invitation to an enhanced messaging 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											←		User A is informed that invitation to an enhanced messaging session has reached user B
31											←		User B rejects the invitation to an enhanced messaging session
32											←	480 Temporarily Unavailable	UE_B responds to the INVITE with 480 Temporarily Unavailable
33											→	480 Temporarily Unavailable	IMS_B forwards 480 Temporarily Unavailable response to AS/IM_B
34											←	480 Temporarily Unavailable	AS/IM_B returns, possibly modified, 480 Temporarily Unavailable response to IMS_B
35											←	480 Temporarily Unavailable	IMS_B forwards 480 Temporarily Unavailable response to IBCF_B
36											←	480 Temporarily Unavailable	IBCF_B forwards 480 Temporarily Unavailable response to IBCF_A
37											←	480 Temporarily Unavailable	IBCF_A forwards 480 Temporarily Unavailable response to IMS_A
38											←	480 Temporarily Unavailable	IMS_A forwards 480 Temporarily Unavailable response to AS/IM_A
39											→	480 Temporarily Unavailable	AS/IM_A returns, possibly modified, 480 Temporarily Unavailable response to IMS_A
40											←	480 Temporarily Unavailable	IMS_A forwards 480 Temporarily Unavailable response to UE_A
41											←		User A is informed that enhanced messaging session was rejected by user B
42											→	ACK	UE_A acknowledges the receipt of 480 Temporarily Unavailable response for INVITE
43											←	ACK	IMS_A forwards ACK to AS/IM_A

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
44												ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
45												ACK	IMS_A forwards ACK to IBCF_A
46												ACK	IBCF_A forwards ACK to IBCF_B
47												ACK	IBCF_B forwards ACK to IMS_B
48												ACK	IMS_B forwards ACK to AS/IM_B
49												ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
50												ACK	IMS_B forwards ACK to UE_B
51													User B is informed that enhanced messaging session is terminated

#### 4.4.3.4.2 UC\_RCS\_6\_R: SIP message flow for Enhanced Messaging - user rejection 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 invites user A to enhanced messaging session	Step 1
2	User A is informed of incoming enhanced messaging session	Step 26
3	User B is informed that invitation to an enhanced messaging session has reached user A	Step 39
4	User A rejects the invitation to an enhanced messaging session	Step 40
5	User B is informed that enhanced messaging session was rejected by user A	Step 53
6	User A is informed that enhanced messaging session is terminated	Step 66

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
1													User B invites user A to enhanced messaging session
2												INVITE	UE_B sends INVITE to IMS_A with 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

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r 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 enhanced messaging session
27											180 Ringing	UE_A responds to initial INVITE with 180 Ringing to indicate that invitation to an enhanced messaging 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												User B is informed that invitation to an enhanced messaging session has reached user A
40												User A rejects the invitation to an enhanced messaging session
41											480 Temporarily Unavailable	UE_A responds to the INVITE with 480 Temporarily Unavailable
42											480 Temporarily Unavailable	IMS_A forwards 480 Temporarily Unavailable response to AS/IM_A



Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
43			→								480 Temporarily Unavailable	AS/IM_A returns, possibly modified, 480 Temporarily Unavailable response to IMS_A
44				→							480 Temporarily Unavailable	IMS_A forwards 480 Temporarily Unavailable response to IBCF_A
45					→						480 Temporarily Unavailable	IBCF_A forwards 480 Temporarily Unavailable response to IBCF_B
46						→					480 Temporarily Unavailable	IBCF_B forwards 480 Temporarily Unavailable response to IMS_B
47							→				480 Temporarily Unavailable	IMS_B forwards 480 Temporarily Unavailable response to AS/IM_B
48								←			480 Temporarily Unavailable	AS/IM_B returns, possibly modified, 480 Temporarily Unavailable response to IMS_B
49								←			480 Temporarily Unavailable	IMS_B forwards 480 Temporarily Unavailable response to IBCF_B
50								←			480 Temporarily Unavailable	IBCF_B forwards 480 Temporarily Unavailable response to IBCF_A
51				←							480 Temporarily Unavailable	IBCF_A forwards 480 Temporarily Unavailable response to IMS_A
52									→		480 Temporarily Unavailable	IMS_A forwards 480 Temporarily Unavailable response to UE_B
53										⇒		User B is informed that enhanced messaging session was rejected by user A
54										←	ACK	UE_B acknowledges the receipt of 480 Temporarily Unavailable response for INVITE
55				→							ACK	IMS_A forwards ACK to IBCF_A
56					→						ACK	IBCF_A forwards ACK to IBCF_B
57						→					ACK	IBCF_B forwards ACK to IMS_B
58							→				ACK	IMS_B forwards ACK to AS/IM_B
59								←			ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
60								←			ACK	IMS_B forwards ACK to IBCF_B
61								←			ACK	IBCF_B forwards ACK to IBCF_A
62								←			ACK	IBCF_A forwards ACK to IMS_A
63			←								ACK	IMS_A forwards ACK to AS/IM_A
64			→								ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
65		←									ACK	IMS_A forwards ACK to UE_A
66	←											User A is informed that enhanced messaging session is terminated

### 4.4.3.5 Enhanced Messaging - no response

Following there are the expected common call flow sequences for enhanced messaging when the incoming one-to-one IM session requests is not answered by the RCS client.

#### 4.4.3.5.1 UC\_RCS\_7\_I: SIP message flow for Enhanced Messaging - no response 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 invites user B to enhanced messaging session	Step 1
2	User B is informed of incoming enhanced messaging session	Step 20
3	User A is informed that invitation to an enhanced messaging session has reached user B	Step 30
4	There is no answer from user B for a certain period of time	Step 31
5	User A is informed that there is no answer from user B	Step 32
6	User B is informed that enhanced messaging session has been cancelled	Step 51
7	User A is informed that enhanced messaging session is terminated	Step 70

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
1	→											User A invites user B to enhanced messaging session	
2			→									INVITE	UE_A sends INVITE with 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
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 enhanced messaging session

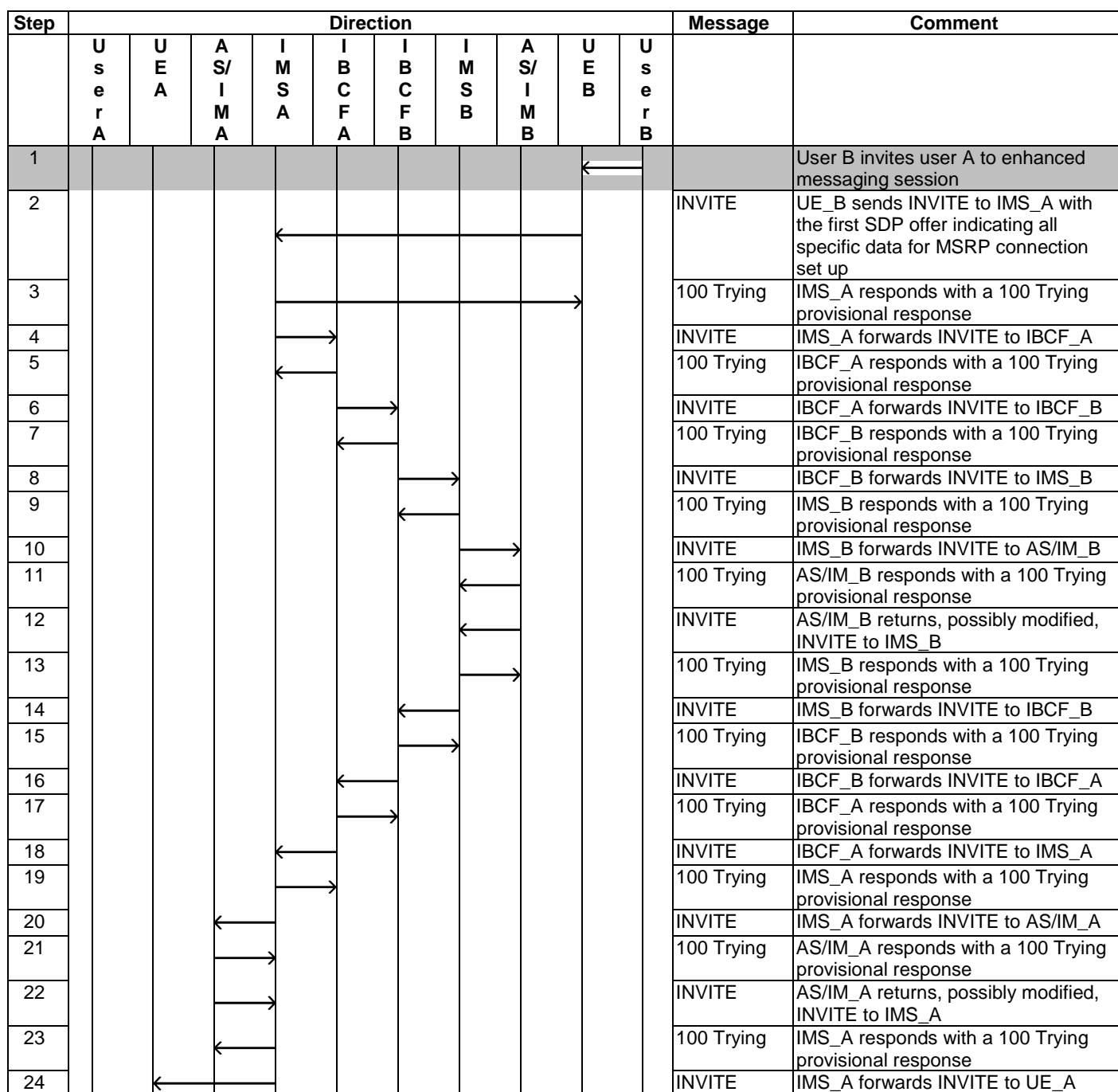
Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
21											←	180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that invitation to an enhanced messaging session has reached the invited user
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											←		User A is informed that invitation to an enhanced messaging session has reached user B
31													There is no answer from user B for a certain period of time
32											←		User A is informed that there is no answer from user B
33											→	CANCEL	UE_A sends CANCEL to IMS_A
34											←	200 OK	IMS_A responds with a 200 OK to UE_A
35											←	CANCEL	IMS_A forwards the CANCEL to AS/IM_A
36											→	200 OK	AS/IM_A responds with a 200 OK to IMS_A
37											→	CANCEL	AS/IM_A returns, possibly modified, CANCEL to IMS_A
38											←	200 OK	IMS_A responds with a 200 OK to AS/IM_A
39											→	CANCEL	IMS_A forwards CANCEL to IBCF_A
40											←	200 OK	IBCF_A responds with a 200 OK to IMS_A
41											→	CANCEL	IBCF_A forwards CANCEL to IBCF_B
42											←	200 OK	IBCF_B responds with a 200 OK to IBCF_A
43											→	CANCEL	IBCF_B forwards CANCEL to IMS_B
44											←	200 OK	IMS_B responds with a 200 OK to IBCF_B
45											→	CANCEL	IMS_B forwards CANCEL to AS/IM_B
46											←	200 OK	AS/IM_B responds with a 200 OK to IMS_B
47											←	CANCEL	AS/IM_B returns, possibly modified, CANCEL to IMS_B
48											→	200 OK	IMS_B responds with a 200 OK to AS/IM_B
49											→	CANCEL	IMS_B forwards CANCE to UE_B

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
50											←	200 OK	UE_B responds with a 200 OK to IMS_B
51											→		User B is informed that enhanced messaging session has been cancelled
52											←	487 Request Terminated	UE_B responds to the INVITE with 487 Request Terminated
53											→	ACK	IMS_B responds with ACK to UE_B
54											→	487 Request Terminated	IMS_B forwards 487 Request Terminated response to AS/IM_B
55											←	ACK	IMS_B responds with ACK to AS/IM_B
56											←	487 Request Terminated	AS/IM_B returns, possibly modified, 487 Request Terminated response to IMS_B
57											→	ACK	AS/IM_B responds with ACK to IMS_B
58											←	487 Request Terminated	IMS_B forwards 487 Request Terminated response to IBCF_B
59											→	ACK	IMS_B responds with ACK to IBCF_B
60											←	487 Request Terminated	IBCF_B forwards 487 Request Terminated response to IBCF_A
61											→	ACK	IBCF_B responds with ACK to IBCF_A
62											←	487 Request Terminated	IBCF_A forwards 487 Request Terminated response to IMS_A
63											→	ACK	IBCF_A responds with ACK to IMS_A
64											←	487 Request Terminated	IMS_A forwards 487 Request Terminated response to AS/IM_A
65											→	ACK	IMS_A responds with ACK to AS/IM_A
66											→	487 Request Terminated	AS/IM_A returns, possibly modified, 487 Request Terminated response to IMS_A
67											←	ACK	AS/IM_A responds with ACK to IMS_A
68											←	487 Request Terminated	IMS_A forwards 487 Request Terminated response to UE_A
69											→	ACK	IMS_A responds with ACK to UE_A
70											←		User A is informed that enhanced messaging session is terminated

#### 4.4.3.5.2 UC\_RCS\_7\_R: SIP message flow for Enhanced Messaging - no response 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 invites user A to enhanced messaging session	Step 1
2	User A is informed of incoming enhanced messaging session	Step 26
3	User B is informed that invitation to an enhanced messaging session has reached user A	Step 39
4	There is no answer from user A for a certain period of time	Step 40
5	User B is informed that there is no answer from user A	Step 41
6	User A is informed that enhanced messaging session has been cancelled	Step 66
7	User B is informed that enhanced messaging session is terminated	Step 91



Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
25												100 Trying	UE_A optionally responds with a 100 Trying provisional response
26													User A is informed of incoming enhanced messaging session
27												180 Ringing	UE_A responds to initial INVITE with 180 Ringing to indicate that invitation to an enhanced messaging 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													User B is informed that invitation to an enhanced messaging session has reached user A
40													There is no answer from user A for a certain period of time
41													User B is informed that there is no answer from user A
42												CANCEL	UE_B sends CANCEL to IMS_A
43												200 OK	IMS_A responds with a 200 OK to UE_B
44												CANCEL	IMS_A forwards CANCEL to IBCF_A
45												200 OK	IBCF_A responds with a 200 OK to IMS_A
46												CANCEL	IBCF_A forwards CANCEL to IBCF_B
47												200 OK	IBCF_B responds with a 200 OK to IBCF_A
48												CANCEL	IBCF_B forwards CANCEL to IMS_B
49												200 OK	IMS_B responds with a 200 OK to IBCF_B
50												CANCEL	IMS_B forwards CANCEL to AS/IM_B
51												200 OK	AS/IM_B responds with a 200 OK to IMS_B
52												CANCEL	AS/IM_B returns, possibly modified, CANCEL to IMS_B
53												200 OK	IMS_B responds with a 200 OK to AS/IM_B
54												CANCEL	IMS_B forwards CANCEL to IBCF_B

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
55												200 OK	IBCF_B responds with a 200 OK to IMS_B
56												CANCEL	IBCF_B forwards CANCEL to IBCF_A
57												200 OK	IBCF_A responds with a 200 OK to IBCF_B
58												CANCEL	IBCF_A forwards CANCEL to IMS_A
59												200 OK	IMS_A responds with a 200 OK to IBCF_A
60												CANCEL	IMS_A forwards CANCEL to AS/IM_A
61												200 OK	AS/IM_A responds with a 200 OK to IMS_A
62												CANCEL	AS/IM_A returns, possibly modified, CANCEL to IMS_A
63												200 OK	IMS_A responds with a 200 OK to AS/IM_A
64												CANCEL	IMS_A forwards CANCEL to UE_A
65												200 OK	UE_A responds with a 200 OK to IMS_A
66													User A is informed that enhanced messaging session has been cancelled
67												487 Request Terminated	UE_A responds to the INVITE with 487 Request Terminated
68												ACK	IMS_A responds with ACK to UE_A
69												487 Request Terminated	IMS_A forwards 487 Request Terminated response to AS/IM_A
70												ACK	AS/IM_A responds with ACK to IMS_A
71												487 Request Terminated	AS/IM_A returns, possibly modified, 487 Request Terminated response to IMS_A
72												ACK	IMS_A responds with ACK to AS/IM_A
73												487 Request Terminated	IMS_A forwards 487 Request Terminated response to IBCF_A
74												ACK	IBCF_A responds with ACK to IMS_A
75												487 Request Terminated	IBCF_A forwards 487 Request Terminated response to IBCF_B
76												ACK	IBCF_B responds with ACK to IBCF_A
77												487 Request Terminated	IBCF_B forwards 487 Request Terminated response to IMS_B
78												ACK	IMS_B responds with ACK to IBCF_B
79												487 Request Terminated	IMS_B forwards 487 Request Terminated response to AS/IM_B
80												ACK	AS/IM_B responds with ACK to IMS_B
81												487 Request Terminated	AS/IM_B returns, possibly modified, 487 Request Terminated response to IMS_B

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
82											→	ACK	IMS_B responds with ACK to AS/IM_B
83											←	487 Request Terminated	IMS_B forwards 180 Ringing response to IBCF_B
84											→	ACK	IBCF_B responds with ACK to IMS_B
85											←	487 Request Terminated	IBCF_B forwards 487 Request Terminated response to IBCF_A
86											→	ACK	IBCF_A responds with ACK to IBCF_B
87											←	487 Request Terminated	IBCF_A forwards 487 Request Terminated response to IMS_A
88											→	ACK	IMS_A responds with ACK to IBCF_A
89											→	487 Request Terminated	IMS_A forwards 487 Request Terminated response to UE_B
90											←	ACK	UE_B responds with ACK to IMS_A
91											→		User B is informed that enhanced messaging session is terminated

#### 4.4.3.6 Enhanced Messaging - Ad-hoc IM Conference

##### 4.4.3.6.1 UC\_RCS\_8\_I: SIP message flow for Enhanced Messaging - Ad-hoc IM Conference with CF\_INT\_AS

NOTE: In this use case AS/IM\_A server assumes to be a Controlling IM server for Ad-hoc IM Conference sessions.

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 an Ad-hoc IM conference with user B	Step 1
2	User A is informed that the Ad Hoc IM Conference is established	Step 8
3	User B is informed of incoming invitation from User A to join the Ad-hoc IM Conference	Step 25
4	User B joins the Ad-hoc IM Conference (automatically)	Step 26
5	User A is notified that User B has joined the Ad-hoc IM Conference	Step 43
6	Users perform enhanced messaging in the Ad-hoc IM Conference	Step 46
7A	User B leaves the Ad-hoc IM Conference	Step 47A
7B	User A leaves the Ad-hoc IM Conference	Step 47B
8A	User B is informed that the Ad-hoc IM Conference has ended	Step 62A
8B	User A is informed that the Ad-hoc IM Conference has ended	Step 52B
9A	User A is notified that user B has left the Ad-hoc IM Conference	Step 65A
10A	User A leaves the Ad-hoc IM Conference	Step 68A
11A	User A is informed that the Ad-hoc IM Conference has ended	Step 73A
11B	User B is informed that the Ad-hoc IM Conference has ended	Step 60B



Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
1	⇒											User A initiates an Ad-hoc IM conference with user B
2		⇒									INVITE	UE_A sends INVITE to IMS_A with a 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 Ad-hoc IM Conference 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 Ad Hoc IM Conference 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 AD-hoc IM Conference) 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 Ad-hoc IM Conference
26										⇒		User B joins the Ad-hoc IM Conference (automatically)

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
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											→	NOTIFY	AS/IM_A sends NOTIFY to UE_A to inform it that User B has successfully joined the Ad-hoc IM Conference
42											←	NOTIFY	IMS_A forwards the NOTIFY to UE_A
43											←		User A is notified that User B has joined the Ad-hoc IM Conference
44											→	200 OK	UE_A responds with 200 OK to IMS_A
45											←	200 OK	IMS_A forwards the 200 OK response to AS/IM_A
46											←		Users perform enhanced messaging in the Ad-hoc IM Conference
47A											←		User B leaves the Ad-hoc IM Conference
48A											←	BYE	UE_B sends BYE to IMS_B to leave the Ad-hoc IM Conference
49A											→	BYE	IMS_B forwards BYE to AS/IM_B
50A											←	BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
51A											←	BYE	IMS_B forwards BYE to IBCF_B
52A											←	BYE	IBCF_B forwards BYE to IBCF_A
53A											←	BYE	IBCF_A forwards BYE to IMS_A
54A											←	BYE	IMS_A forwards BYE to AS/IM_A
55A											→	200 OK	AS/IM_A sends 200 OK for BYE
56A											→	200 OK	IMS_A forwards 200 OK response to IBCF_A
57A											→	200 OK	IBCF_A forwards 200 OK response to IBCF_B
58A											→	200 OK	IBCF_B forwards 200 OK response to IMS_B

Step	Direction										Message	Comment		
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B				
59A												200 OK	IMS_B forwards 200 OK response to AS/IM_B	
60A												200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B	
61A												200 OK	IMS_B forwards 200 OK response to UE_B	
62A													⇒	User B is informed that the Ad-hoc IM Conference has ended
63A												NOTIFY	AS/IM_A sends NOTIFY to IMS_A to inform UE_A that User B has left the Ad-hoc IM Conference	
64A												NOTIFY	IMS_A forwards the NOTIFY to UE_A	
65A													←	User A is notified that user B has left the Ad-hoc IM Conference
66A												200 OK	UE_A responds with 200 OK to IMS_A	
67A												200 OK	IMS_A forwards the 200 OK response to AS/IM_A	
68A													⇒	User A leaves the Ad-hoc IM Conference
69A												BYE	UE_A sends BYE to IMS_A to leave the Ad-hoc IM Conference	
70A												BYE	IMS_A forwards BYE to AS/IM_A	
71A												200 OK	AS/IM_A sends 200 OK for BYE	
72A												200 OK	IMS_A forwards 200 OK response to UE_A	
73A													←	User A is informed that the Ad-hoc IM Conference has ended
47B													⇒	User A leaves the Ad-hoc IM Conference
48B												BYE	UE_A sends BYE to IMS_A to leave the Ad-hoc IM Conference	
49B												BYE	IMS_A forwards BYE to AS/IM_A	
50B												200 OK	AS/IM_A sends 200 OK for BYE	
51B												200 OK	IMS_A forwards 200 OK response to UE_A	
52B													←	User A is informed that the Ad-hoc IM Conference has ended
53B												BYE	AS/IM_A releases the Ad-hoc IM Conference	
54B												BYE	IMS_A forwards BYE to IBCF_A	
55B												BYE	IBCF_A forwards BYE to IBCF_B	
56B												BYE	IBCF_B forwards BYE to IMS_B	
57B												BYE	IMS_B forwards BYE to AS/IM_B	
58B												BYE	AS/IM_B returns, possibly modified, BYE to IMS_B	
59B												BYE	IMS_B forwards BYE to UE_B	
60B													⇒	User B is informed that the Ad-hoc IM Conference has ended
61B												200 OK	UE_B sends 200 OK for BYE	
62B												200 OK	IMS_B forwards 200 OK response to AS/IM_B	
63B												200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B	
64B												200 OK	IMS_B forwards 200 OK response to IBCF_B	
65B												200 OK	IBCF_B forwards 200 OK response to IBCF_A	

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
66B					←							200 OK	IBCF_A forwards 200 OK response to IMS_A
67B			←									200 OK	IMS_A forwards 200 OK response to AS/IM_A

#### 4.4.3.6.2 UC\_RCS\_8\_R: SIP message flow for Enhanced Messaging - Ad-hoc IM Conference with CF\_ROAM\_AS

NOTE: In this use case AS/IM\_B server assumes to be a Controlling IM server for Ad-hoc IM Conference sessions.

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 an Ad-hoc IM conference with user A	Step 1
2	User B is informed that the Ad Hoc IM Conference is established	Step 17
3	User A is informed of incoming invitation from User B to join the Ad-hoc IM Conference	Step 37
4	User A joins the Ad-hoc IM Conference (automatically)	Step 38
5	User B is notified that User A has joined the Ad-hoc IM Conference	Step 58
6	Users perform enhanced messaging in the Ad-hoc IM Conference	Step 64
7A	User A leaves the Ad-hoc IM Conference	Step 65A
7B	User B leaves the Ad-hoc IM Conference	Step 65B
8A	User A is informed that the Ad-hoc IM Conference has ended	Step 80A
8B	User B is informed that the Ad-hoc IM Conference has ended	Step 76B
9A	User B is notified that user A has left the Ad-hoc IM Conference	Step 86A
10A	User B leaves the Ad-hoc IM Conference	Step 92A
11A	User B is informed that the Ad-hoc IM Conference has ended	Step 103A
11B	User A is informed that the Ad-hoc IM Conference has ended	Step 84B

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
1										←		User B initiates an Ad-hoc IM conference with user A	
2					←							INVITE	UE_B sends INVITE to IMS_A with a 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

Step	Direction											Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r 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 Ad-hoc IM Conference 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 Ad Hoc IM Conference 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 AD-hoc IM Conference) 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 Ad-hoc IM Conference
38												→		User A joins the Ad-hoc IM Conference (automatically)

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
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											NOTIFY	AS/IM_B sends NOTIFY to UE_B to inform it that User A has successfully joined the Ad-hoc IM Conference
54											NOTIFY	IMS_B forwards NOTIFY to IBCF_B
55											NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
56											NOTIFY	IBCF_A forwards NOTIFY to IMS_A
57											NOTIFY	IMS_A forwards NOTIFY to UE_B
58												User B is notified that User A has joined the Ad-hoc IM Conference
59											200 OK	UE_B responds with 200 OK to IMS_A
60											200 OK	IMS_A forwards 200 OK response to IBCF_A
61											200 OK	IBCF_A forwards 200 OK response to IBCF_B
62											200 OK	IBCF_B forwards 200 OK response to IMS_B
63											200 OK	IMS_B forwards 200 OK response to AS/IM_B
64												Users perform enhanced messaging in the Ad-hoc IM Conference
65A												User A leaves the Ad-hoc IM Conference
66A											BYE	UE_A sends BYE to IMS_A to leave the Ad-hoc IM Conference
67A											BYE	IMS_A forwards BYE to AS/IM_A
68A											BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
69A											BYE	IMS_A forwards BYE to IBCF_A
70A											BYE	IBCF_A forwards BYE to IBCF_B
71A											BYE	IBCF_B forwards BYE to IMS_B
72A											BYE	IMS_B forwards BYE to AS/IM_B
73A											200 OK	AS/IM_B sends 200 OK for BYE

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
74A											200 OK	IMS_B forwards 200 OK response to IBCF_B
75A											200 OK	IBCF_B forwards 200 OK response to IBCF_A
76A											200 OK	IBCF_A forwards 200 OK response to IMS_A
77A											200 OK	IMS_A forwards 200 OK response to AS/IM_A
78A											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
79A											200 OK	IMS_A forwards 200 OK response to UE_A
80A												User A is informed that the Ad-hoc IM Conference has ended
81A											NOTIFY	AS/IM_B sends NOTIFY to IMS_B to inform UE_B that User A has left the Ad-hoc IM Conference
82A											NOTIFY	IMS_B forwards NOTIFY to IBCF_B
83A											NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
84A											NOTIFY	IBCF_A forwards NOTIFY to IMS_A
85A											NOTIFY	IMS_A forwards NOTIFY to UE_B
86A												User B is notified that user A has left the Ad-hoc IM Conference
87A											200 OK	UE_B responds with 200 OK to IMS_A
88A											200 OK	IMS_A forwards 200 OK response to IBCF_A
89A											200 OK	IBCF_A forwards 200 OK response to IBCF_B
90A											200 OK	IBCF_B forwards 200 OK response to IMS_B
91A											200 OK	IMS_B forwards 200 OK response to AS/IM_B
92A												User B leaves the Ad-hoc IM Conference
93A											BYE	UE_B sends BYE to IMS_A to leave the Ad-hoc IM Conference
94A											BYE	IMS_A forwards BYE to IBCF_A
95A											BYE	IBCF_A forwards BYE to IBCF_B
96A											BYE	IBCF_B forwards BYE to IMS_B
97A											BYE	IMS_B forwards BYE to AS/IM_B
98A											200 OK	AS/IM_B sends 200 OK for BYE
99A											200 OK	IMS_B forwards 200 OK response to IBCF_B
100A											200 OK	IBCF_B forwards 200 OK response to IBCF_A
101A											200 OK	IBCF_A forwards 200 OK response to IMS_A
102A											200 OK	IMS_A forwards 200 OK response to UE_B
103A												User B is informed that the Ad-hoc IM Conference has ended
65B												User B leaves the Ad-hoc IM Conference
66B											BYE	UE_B sends BYE to IMS_A to leave the Ad-hoc IM Conference
67B											BYE	IMS_A forwards BYE to IBCF_A
68B											BYE	IBCF_A forwards BYE to IBCF_B
69B											BYE	IBCF_B forwards BYE to IMS_B

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
70B												BYE	IMS_B forwards BYE to AS/IM_B
71B												200 OK	AS/IM_B sends 200 OK for BYE
72B												200 OK	IMS_B forwards 200 OK response to IBCF_B
73B												200 OK	IBCF_B forwards 200 OK response to IBCF_A
74B												200 OK	IBCF_A forwards 200 OK response to IMS_A
75B												200 OK	IMS_A forwards 200 OK response to UE_B
76B													User B is informed that the Ad-hoc IM Conference has ended
77B												BYE	AS/IM_B releases the Ad-hoc IM Conference
78B												BYE	IMS_B forwards BYE to IBCF_B
79B												BYE	IBCF_B forwards BYE to IBCF_A
80B												BYE	IBCF_A forwards BYE to IMS_A
81B												BYE	IMS_A forwards BYE to AS/IM_A
82B												BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
83B												BYE	IMS_A forwards BYE to UE_A
84B													User A is informed that the Ad-hoc IM Conference has ended
85B												200 OK	UE_A sends 200 OK for BYE
86B												200 OK	IMS_A forwards 200 OK response to AS/IM_A
87B												200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
88B												200 OK	IMS_A forwards 200 OK response to IBCF_A
89B												200 OK	IBCF_A forwards 200 OK response to IBCF_B
90B												200 OK	IBCF_B forwards 200 OK response to IMS_B
91B												200 OK	IMS_B forwards 200 OK response to AS/IM_B

#### 4.4.3.7 Enhanced Messaging - Extending 1-to-1 IM session to an Ad-hoc IM conference

##### 4.4.3.7.1 UC\_RCS\_9\_I: SIP message flow for Enhanced Messaging - Extending 1-to-1 IM session to an Ad-hoc IM conference with CF\_INT\_AS

NOTE: In this use case AS/IM\_A server assumes to be a Controlling IM server for Ad-hoc IM Conference sessions.

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 invites user B to enhanced messaging session	UC_RCS_4_I Step 1
2	User B is informed of incoming enhanced messaging session	UC_RCS_4_I Step 20
3	Users perform enhanced messaging	UC_RCS_4_I Step 39
4	User A initiates an Ad-hoc IM conference with user B	Step 40
5	User A is informed that the Ad Hoc IM Conference is established	Step 47
6	User B is informed of incoming invitation from User A to join the Ad-hoc IM Conference	Step 64



Step	Action	CF_INT_AS
7	User B joins the Ad-hoc IM Conference (automatically)	Step 65
8	User A is notified that User B has joined the Ad-hoc IM Conference	Step 82
9	User A informed that 1-to-1 IM session with user B has ended	Step 94
10	User B informed that 1-to-1 IM session with user A has ended	Step 104
11	Users perform enhanced messaging in the Ad-hoc IM Conference	Step 105
12A	User B leaves the Ad-hoc IM Conference	UC_RCS_8_I Step 47A
12B	User A leaves the Ad-hoc IM Conference	UC_RCS_8_I Step 47B
13A	User B is informed that the Ad-hoc IM Conference has ended	UC_RCS_8_I Step 62A
13B	User A is informed that the Ad-hoc IM Conference has ended	UC_RCS_8_I Step 52B
14A	User A is notified that user B has left the Ad-hoc IM Conference	UC_RCS_8_I Step 65A
15A	User A leaves the Ad-hoc IM Conference	UC_RCS_8_I Step 68A
16A	User A is informed that the Ad-hoc IM Conference has ended	UC_RCS_8_I Step 73A
16B	User B is informed that the Ad-hoc IM Conference has ended	UC_RCS_8_I Step 60B

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
												Follow UC_RCS_4_I (1-39)
40		→										User A initiates an Ad-hoc IM conference with user B
41			→									INVITE UE_A sends INVITE to IMS_A with a MIME resource-list body including invited IM Users and the first SDP offer indicating all specific data for MSRP connection set up
42			←									100 Trying IMS_A responds with a 100 Trying provisional response
43			←									INVITE IMS_A forwards INVITE to AS/IM_A
44			→									100 Trying AS/IM_A responds with a 100 Trying provisional response
45			→									200 OK AS/IM_A responds INVITE with 200 OK response with IM session Identity allocated for the current Ad-hoc IM Conference to indicate that the session has been accepted and SDP to inform A-side with specific data for MSRP connection set up
46			←									200 OK IMS_A forwards 200 OK response to AS/IM_A
47	←											User A is informed that the Ad Hoc IM Conference is established
48			→									ACK UE_A acknowledges the receipt of 200 OK for INVITE
49			←									ACK IMS_A forwards ACK to AS/IM_A
50			→									INVITE AS/IM_A sends INVITE to UE_B with IM session identity (allocated for the current AD-hoc IM Conference), IM address of the Inviting IM UE (UE_A) and Replaces header with the original 1-to-1 session identity
51			←									100 Trying IMS_A responds with a 100 Trying provisional response
52			→									INVITE IMS_A forwards INVITE to IBCF_A
53			←									100 Trying IBCF_A responds with a 100 Trying provisional response
54			→									INVITE IBCF_A forwards INVITE to IBCF_B
55			←									100 Trying IBCF_B responds with a 100 Trying provisional response
56			→									INVITE IBCF_B forwards INVITE to IMS_B

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
57											100 Trying	IMS_B responds with a 100 Trying provisional response
58											INVITE	IMS_B forwards INVITE to AS/IM_B
59											100 Trying	AS/IM_B responds with a 100 Trying provisional response
60											INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
61											100 Trying	IMS_B responds with a 100 Trying provisional response
62											INVITE	IMS_B forwards INVITE to UE_B
63											100 Trying	UE_B optionally responds with a 100 Trying provisional response
64												User B is informed of incoming invitation from User A to join the Ad-hoc IM Conference
65												User B joins the Ad-hoc IM Conference (automatically)
66											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
67											200 OK	IMS_B forwards 200 OK response to AS/IM_B
68											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
69											200 OK	IMS_B forwards 200 OK response to IBCF_B
70											200 OK	IBCF_B forwards 200 OK response to IBCF_A
71											200 OK	IBCF_A forwards 200 OK response to IMS_A
72											200 OK	IMS_A forwards 200 OK response to AS/IM_A
73											ACK	AS/IM_A acknowledges the receipt of 200 OK for INVITE
74											ACK	IMS_A forwards ACK to IBCF_A
75											ACK	IBCF_A forwards ACK to IBCF_B
76											ACK	IBCF_B forwards ACK to IMS_B
77											ACK	IMS_B forwards ACK to AS/IM_B
78											ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
79											ACK	IMS_B forwards ACK to UE_B
80											NOTIFY	AS/IM_A sends NOTIFY to UE_A to inform it that User B has successfully joined the Ad-hoc IM Conference
81											NOTIFY	IMS_A forwards the NOTIFY to UE_A
82												User A is notified that User B has joined the Ad-hoc IM Conference
83											200 OK	UE_A responds with 200 OK to IMS_A
84											200 OK	IMS_A forwards the 200 OK response to AS/IM_A
85											BYE	UE_B releases the 1-to-1 IM session with BYE
86											BYE	IMS_B forwards BYE to AS/IM_B
87											BYE	AS/IM_B returns, possibly modified, BYE to IMS_B

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
88												BYE	IMS_B forwards BYE to IBCF_B
89												BYE	IBCF_B forwards BYE to IBCF_A
90												BYE	IBCF_A forwards BYE to IMS_A
91												BYE	IMS_A forwards BYE to AS/IM_A
92												BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
93												BYE	IMS_A forwards BYE to UE_A
94													User A informed that 1-to-1 IM session with user B has ended
95												200 OK	UE_A sends 200 OK for BYE
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 IBCF_A
99												200 OK	IBCF_A forwards 200 OK response to IBCF_B
100												200 OK	IBCF_B forwards 200 OK response to IMS_B
101												200 OK	IMS_B forwards 200 OK response to AS/IM_B
102												200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
103												200 OK	IMS_B forwards 200 OK response to UE_B
104													User B informed that 1-to-1 IM session with user A has ended
105													Users perform enhanced messaging in the Ad-hoc IM Conference
													Continue UC_RCS_8_I (47A-67B)

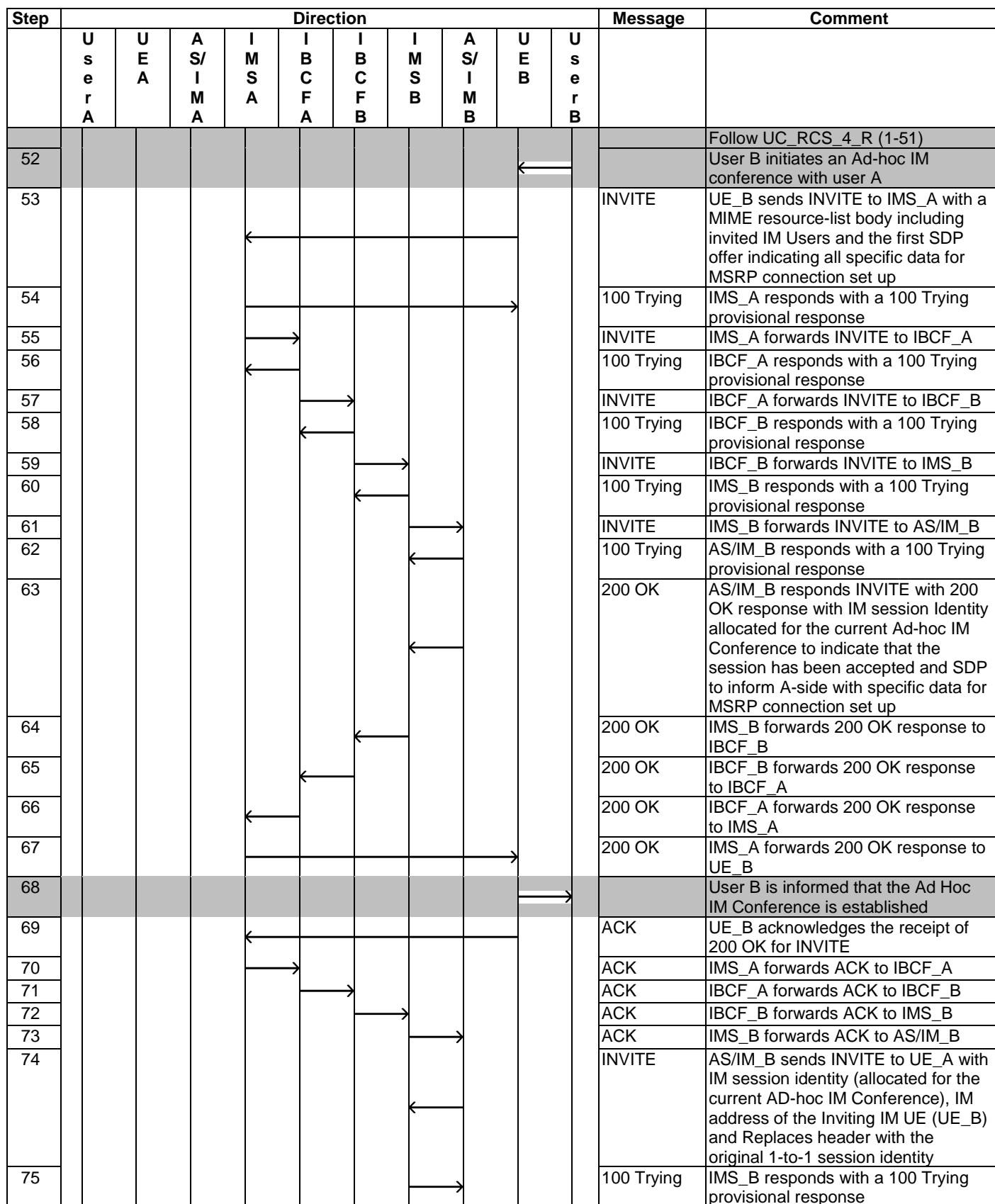
#### 4.4.3.7.2 UC\_RCS\_9\_R: SIP message flow for Enhanced Messaging - Extending 1-to-1 IM session to an Ad-hoc IM conference with CF\_ROAM\_AS

NOTE: In this use case AS/IM\_B server assumes to be a Controlling IM server for Ad-hoc IM Conference sessions.

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 invites user A to enhanced messaging session	UC_RCS_4_R Step 1
2	User A is informed of incoming enhanced messaging session	UC_RCS_4_R Step 26
3	Users perform enhanced messaging	UC_RCS_4_R Step 51
4	User B initiates an Ad-hoc IM conference with user A	Step 52
5	User B is informed that the Ad Hoc IM Conference is established	Step 68
6	User A is informed of incoming invitation from user B to join the Ad-hoc IM Conference	Step 88
7	User A joins the Ad-hoc IM Conference (automatically)	Step 89
8	User B is notified that User A has joined the Ad-hoc IM Conference	Step 109
9	User B informed that 1-to-1 IM session with user A has ended	Step 127
10	User A informed that 1-to-1 IM session with user B has ended	Step 140
11	Users perform enhanced messaging in the Ad-hoc IM Conference	Step 141
12A	User A leaves the Ad-hoc IM Conference	UC_RCS_8_R Step 65A
12B	User B leaves the Ad-hoc IM Conference	UC_RCS_8_R Step 65B
13A	User A is informed that the Ad-hoc IM Conference has ended	UC_RCS_8_R Step 80A
13B	User B is informed that the Ad-hoc IM Conference has ended	UC_RCS_8_R Step 76B

Step	Action	CF_ROAM_AS
14A	User B is notified that user A has left the Ad-hoc IM Conference	UC_RCS_8_R Step 86A
15A	User B leaves the Ad-hoc IM Conference	UC_RCS_8_R Step 92A
16A	User B is informed that the Ad-hoc IM Conference has ended	UC_RCS_8_R Step 103A
16B	User A is informed that the Ad-hoc IM Conference has ended	UC_RCS_8_R Step 84B



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		
76											INVITE	IMS_B forwards INVITE to IBCF_B
77											100 Trying	IBCF_B responds with a 100 Trying provisional response
78											INVITE	IBCF_B forwards INVITE to IBCF_A
79											100 Trying	IBCF_A responds with a 100 Trying provisional response
80											INVITE	IBCF_A forwards INVITE to IMS_A
81											100 Trying	IMS_A responds with a 100 Trying provisional response
82											INVITE	IMS_A forwards INVITE to AS/IM_A
83											100 Trying	AS/IM_A responds with a 100 Trying provisional response
84											INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
85											100 Trying	IMS_A responds with a 100 Trying provisional response
86											INVITE	IMS_A forwards INVITE to UE_A
87											100 Trying	UE_A optionally responds with a 100 Trying provisional response
88												User A is informed of incoming invitation from user B to join the Ad-hoc IM Conference
89												User A joins the Ad-hoc IM Conference (automatically)
90											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
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											ACK	AS/IM_B acknowledges the receipt of 200 OK for INVITE
98											ACK	IMS_B forwards ACK to IBCF_B
99											ACK	IBCF_B forwards ACK to IBCF_A
100											ACK	IBCF_A forwards ACK to IMS_A
101											ACK	IMS_A forwards ACK to AS/IM_A
102											ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
103											ACK	IMS_A forwards ACK to UE_A
104											NOTIFY	AS/IM_B sends NOTIFY to UE_B to inform it that User A has successfully joined the Ad-hoc IM Conference
105											NOTIFY	IMS_B forwards NOTIFY to IBCF_B
106											NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
107											NOTIFY	IBCF_A forwards NOTIFY to IMS_A
108											NOTIFY	IMS_A forwards NOTIFY to UE_B
109												User B is notified that User A has joined the Ad-hoc IM Conference

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
110				←							200 OK	UE_B responds with 200 OK to IMS_A
111					→						200 OK	IMS_A forwards 200 OK response to IBCF_A
112						→					200 OK	IBCF_A forwards 200 OK response to IBCF_B
113							→				200 OK	IBCF_B forwards 200 OK response to IMS_B
114								→			200 OK	IMS_B forwards 200 OK response to AS/IM_B
115		→									BYE	UE_A releases the 1-to-1 IM session with BYE
116			←								BYE	IMS_A forwards BYE to AS/IM_A
117				→							BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
118					→						BYE	IMS_A forwards BYE to IBCF_A
119						→					BYE	IBCF_A forwards BYE to IBCF_B
120							→				BYE	IBCF_B forwards BYE to IMS_B
121								→			BYE	IMS_B forwards BYE to AS/IM_B
122									←		BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
123									←		BYE	IMS_B forwards BYE to IBCF_B
124					←						BYE	IBCF_B forwards BYE to IBCF_A
125				←							BYE	IBCF_A forwards BYE to IMS_A
126										→	BYE	IMS_A forwards BYE to UE_B
127										→		User B informed that 1-to-1 IM session with user A has ended
128				←							200 OK	UE_B sends 200 OK for BYE
129					→						200 OK	IMS_A forwards 200 OK response to IBCF_A
130						→					200 OK	IBCF_A forwards 200 OK response to IBCF_B
131							→				200 OK	IBCF_B forwards 200 OK response to IMS_B
132								→			200 OK	IMS_B forwards 200 OK response to AS/IM_B
133									←		200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
134							←				200 OK	IMS_B forwards 200 OK response to IBCF_B
135								←			200 OK	IBCF_B forwards 200 OK response to IBCF_A
136									←		200 OK	IBCF_A forwards 200 OK response to IMS_A
137				←							200 OK	IMS_A forwards 200 OK response to AS/IM_A
138					→						200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
139		←									200 OK	IMS_A forwards 200 OK response to UE_A
140	←											User A informed that 1-to-1 IM session with user B has ended
141	←											Users perform enhanced messaging in the Ad-hoc IM Conference
												Continue UC_RCS_4_R (65A-91B)

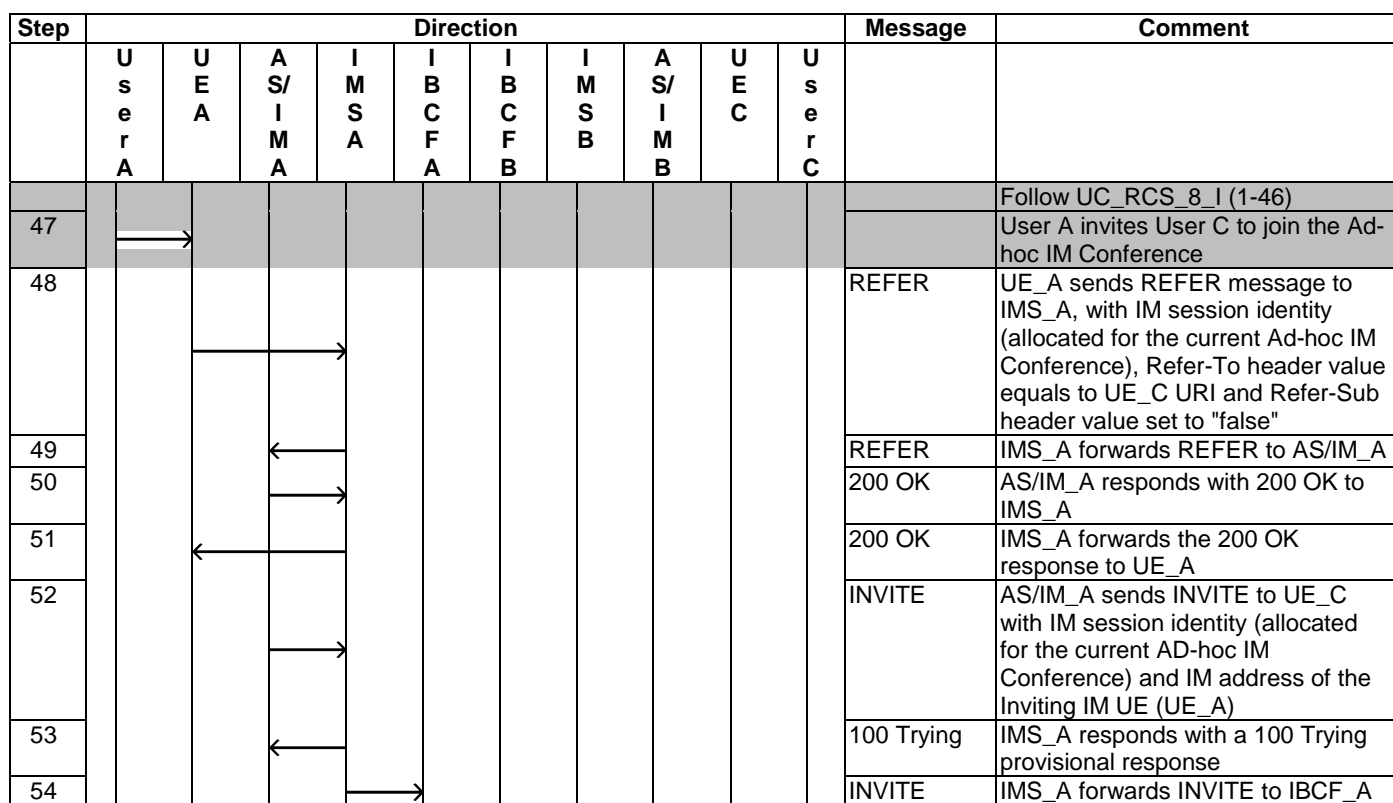
## 4.4.3.8 Enhanced Messaging - Adding users to an Ad-hoc IM

## 4.4.3.8.1 UC\_RCS\_10\_I: SIP message flow for Enhanced Messaging - Adding users to an Ad-hoc IM Conference with CF\_INT\_AS

NOTE: In this use case AS/IM\_A server assumes to be a Controlling IM server for Ad-hoc IM Conference sessions.

In the following use case, User C is connected to the IMS\_B network via its UE\_C:

Step	Action	CF_INT_AS
1	User A initiates an Ad-hoc IM conference with user B	UC_RCS_8_I Step 1
2	User A is informed that the Ad hoc IM Conference is established	UC_RCS_8_I Step 8
3	User B is informed of incoming invitation from User A to join the Ad-hoc IM Conference	UC_RCS_8_I Step 25
4	User B joins the Ad-hoc IM Conference (automatically)	UC_RCS_8_I Step 26
5	User A is notified that User B has joined the Ad-hoc IM Conference	UC_RCS_8_I Step 43
6	Users perform enhanced messaging in the Ad-hoc IM Conference	UC_RCS_8_I Step 46
7	User A invites User C to join the Ad-hoc IM Conference	Step 47
8	User C is informed of incoming invitation from User A to join the Ad-hoc IM Conference	Step 66
9	User C joins the Ad-hoc IM Conference (automatically)	Step 67
10	User A is notified that User C has joined the Ad-hoc IM Conference	Step 84
11	Users perform enhanced messaging in the Ad-hoc IM Conference	Step 87
12	User C leaves the Ad-hoc IM Conference	Step 88
13	User C is informed that the Ad-hoc IM Conference has ended	Step 103
14	User A is notified that User C has left the Ad-hoc IM Conference	Step 106
15A	User B leaves the Ad-hoc IM Conference	UC_RCS_8_I Step 47A
15B	User A leaves the Ad-hoc IM Conference	UC_RCS_8_I Step 47B
16A	User B is informed that the Ad-hoc IM Conference has ended	UC_RCS_8_I Step 62A
16B	User A is informed that the Ad-hoc IM Conference has ended	UC_RCS_8_I Step 62B
17A	User A is notified that user B has left the Ad-hoc IM Conference	UC_RCS_8_I Step 65A
18A	User A leaves the Ad-hoc IM Conference	UC_RCS_8_I Step 68A
19A	User A is informed that the Ad-hoc IM Conference has ended	UC_RCS_8_I Step 73A
19B	User B is informed that the Ad-hoc IM Conference has ended	UC_RCS_8_I Step 60B



Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E C	U s e r C		
55				←							100 Trying	IBCF_A responds with a 100 Trying provisional response
56					→						INVITE	IBCF_A forwards INVITE to IBCF_B
57						←					100 Trying	IBCF_B responds with a 100 Trying provisional response
58							→				INVITE	IBCF_B forwards INVITE to IMS_B
59						←					100 Trying	IMS_B responds with a 100 Trying provisional response
60							→				INVITE	IMS_B forwards INVITE to AS/IM_B
61								←			100 Trying	AS/IM_B responds with a 100 Trying provisional response
62								←			INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
63							→				100 Trying	IMS_B responds with a 100 Trying provisional response
64								→			INVITE	IMS_B forwards INVITE to UE_C
65								←			100 Trying	UE_C optionally responds with a 100 Trying provisional response
66									→			User C is informed of incoming invitation from User A to join the Ad-hoc IM Conference
67									←			User C joins the Ad-hoc IM Conference (automatically)
68								←			200 OK	UE_C 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
69								→			200 OK	IMS_B forwards 200 OK response to AS/IM_B
70								←			200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
71								←			200 OK	IMS_B forwards 200 OK response to IBCF_B
72								←			200 OK	IBCF_B forwards 200 OK response to IBCF_A
73								←			200 OK	IBCF_A forwards 200 OK response to IMS_A
74				←							200 OK	IMS_A forwards 200 OK response to AS/IM_A
75			→								ACK	AS/IM_A acknowledges the receipt of 200 OK for INVITE
76				→							ACK	IMS_A forwards ACK to IBCF_A
77					→						ACK	IBCF_A forwards ACK to IBCF_B
78						→					ACK	IBCF_B forwards ACK to IMS_B
79							→				ACK	IMS_B forwards ACK to AS/IM_B
80								←			ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
81								→			ACK	IMS_B forwards ACK to UE_C
82											NOTIFY	AS/IM_A sends NOTIFY to UE_A to inform it that User C has successfully joined the Ad-hoc IM Conference
83											NOTIFY	IMS_A forwards the NOTIFY to UE_A
84	←											User A is notified that User C has joined the Ad-hoc IM Conference
85				→							200 OK	UE_A responds with 200 OK to IMS_A



Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E C	U s e r C			
86			←									200 OK	IMS_A forwards the 200 OK response to AS/IM_A
87	←												Users perform enhanced messaging in the Ad-hoc IM Conference
88											←		User C leaves the Ad-hoc IM Conference
89									←			BYE	UE_C sends BYE to IMS_B to leave the Ad-hoc IM Conference
90									→			BYE	IMS_B forwards BYE to AS/IM_B
91									←			BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
92									←			BYE	IMS_B forwards BYE to IBCF_B
93									←			BYE	IBCF_B forwards BYE to IBCF_A
94									←			BYE	IBCF_A forwards BYE to IMS_A
95			←									BYE	IMS_A forwards BYE to AS/IM_A
96			→									200 OK	AS/IM_A sends 200 OK for BYE
97				→								200 OK	IMS_A forwards 200 OK response to IBCF_A
98					→							200 OK	IBCF_A forwards 200 OK response to IBCF_B
99						→						200 OK	IBCF_B forwards 200 OK response to IMS_B
100									→			200 OK	IMS_B forwards 200 OK response to AS/IM_B
101									←			200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
102									→			200 OK	IMS_B forwards 200 OK response to UE_C
103									→				User C is informed that the Ad-hoc IM Conference has ended
104				→								NOTIFY	AS/IM_A sends NOTIFY to IMS_A to inform UE_A that User C has left the Ad-hoc IM Conference
105			←									NOTIFY	IMS_A forwards the NOTIFY to UE_A
106	←												User A is notified that User C has left the Ad-hoc IM Conference
107				→								200 OK	UE_A responds with 200 OK to IMS_A
108			←									200 OK	IMS_A forwards the 200 OK response to AS/IM_A
													Continue UC_RCS_8_I (47A-67B)

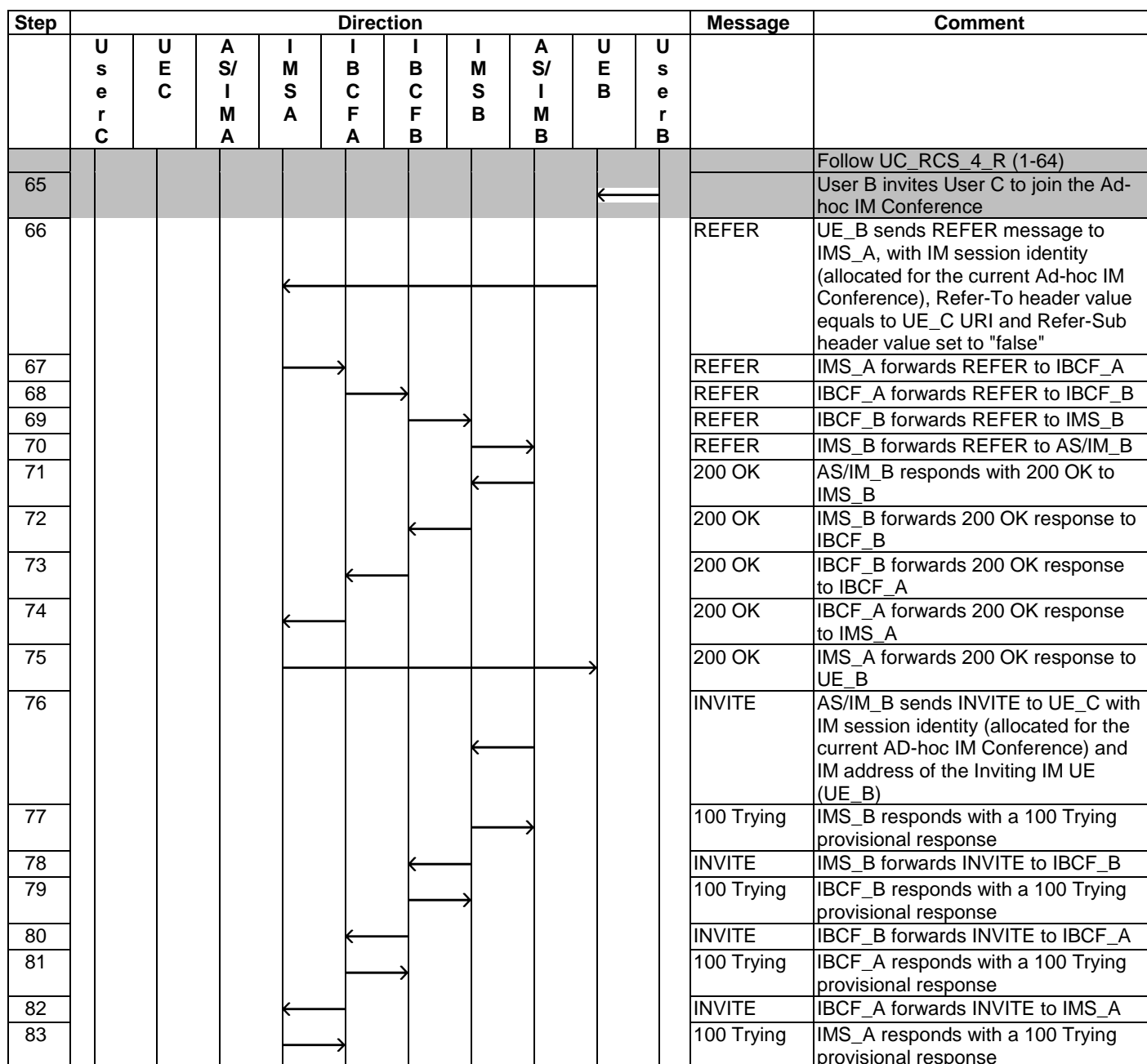
#### 4.4.3.8.2 UC\_RCS\_10\_R: SIP message flow for Enhanced Messaging - Adding users to an Ad-hoc IM Conference with CF\_ROAM\_AS

NOTE: In this use case AS/IM\_B server assumes to be a Controlling IM server for Ad-hoc IM Conference sessions.

In the following use case, User C is connected to the IMS\_A network via its UE\_C:

Step	Action	CF_ROAM_AS
1	User B initiates an Ad-hoc IM conference with user A	UC_RCS_8_R Step 1
2	User B is informed that the Ad Hoc IM Conference is established	UC_RCS_8_R Step 17
3	User A is informed of incoming invitation from User B to join the Ad-hoc IM Conference	UC_RCS_8_R Step 37
4	User A joins the Ad-hoc IM Conference (automatically)	UC_RCS_8_R Step 38
5	User B is notified that User A has joined the Ad-hoc IM Conference	UC_RCS_8_R Step 58

Step	Action	CF_ROAM_AS
6	Users perform enhanced messaging in the Ad-hoc IM Conference	UC_RCS_8_R Step 64
7	User B invites User C to join the Ad-hoc IM Conference	Step 65
8	User C is informed of incoming invitation from User B to join the Ad-hoc IM Conference	Step 90
9	User C joins the Ad-hoc IM Conference (automatically)	Step 91
10	User B is notified that User C has joined the Ad-hoc IM Conference	Step 111
11	Users perform enhanced messaging in the Ad-hoc IM Conference	Step 117
12	User C leaves the Ad-hoc IM Conference	Step 118
13	User C is informed that the Ad-hoc IM Conference has ended	Step 133
14	User B is notified that User C has left the Ad-hoc IM Conference	Step 139
15A	User A leaves the Ad-hoc IM Conference	UC_RCS_8_R Step 65A
15B	User B leaves the Ad-hoc IM Conference	UC_RCS_8_R Step 65B
16A	User A is informed that the Ad-hoc IM Conference has ended	UC_RCS_8_R Step 80A
16B	User B is informed that the Ad-hoc IM Conference has ended	UC_RCS_8_R Step 76B
17A	User B is notified that user A has left the Ad-hoc IM Conference	UC_RCS_8_R Step 86A
18A	User B leaves the Ad-hoc IM Conference	UC_RCS_8_R Step 92A
19A	User B is informed that the Ad-hoc IM Conference has ended	UC_RCS_8_R Step 103A
19B	User A is informed that the Ad-hoc IM Conference has ended	UC_RCS_8_R Step 84B



Step	Direction										Message	Comment
	U s e r C	U E C	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
84			←								INVITE	IMS_A forwards INVITE to AS/IM_A
85			→								100 Trying	AS/IM_A responds with a 100 Trying provisional response
86			→								INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
87			←								100 Trying	IMS_A responds with a 100 Trying provisional response
88		←	→								INVITE	IMS_A forwards INVITE to UE_C
89		→	→								100 Trying	UE_C optionally responds with a 100 Trying provisional response
90	←											User C is informed of incoming invitation from User B to join the Ad-hoc IM Conference
91	→											User C joins the Ad-hoc IM Conference (automatically)
92			→								200 OK	UE_C 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
93			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
94			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response 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								←			ACK	AS/IM_B acknowledges the receipt of 200 OK for INVITE
100									←		ACK	IMS_B forwards ACK to IBCF_B
101										←	ACK	IBCF_B forwards ACK to IBCF_A
102										←	ACK	IBCF_A forwards ACK to IMS_A
103			←								ACK	IMS_A forwards ACK to AS/IM_A
104			→								ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
105		←	→								ACK	IMS_A forwards ACK to UE_C
106											NOTIFY	AS/IM_B sends NOTIFY to UE_B to inform it that User C has successfully joined the Ad-hoc IM Conference
107											NOTIFY	IMS_B forwards NOTIFY to IBCF_B
108											NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
109											NOTIFY	IBCF_A forwards NOTIFY to IMS_A
110											NOTIFY	IMS_A forwards NOTIFY to UE_B
111												User B is notified that User C has joined the Ad-hoc IM Conference
112			←								200 OK	UE_B responds with 200 OK to IMS_A
113			→								200 OK	IMS_A forwards 200 OK response to IBCF_A
114					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
115						→					200 OK	IBCF_B forwards 200 OK response to IMS_B

Step	Direction										Message	Comment	
	U s e r C	U E C	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
116												200 OK	IMS_B forwards 200 OK response to AS/IM_B
117													Users perform enhanced messaging in the Ad-hoc IM Conference
118													User C leaves the Ad-hoc IM Conference
119												BYE	UE_C sends BYE to IMS_A to leave the Ad-hoc IM Conference
120												BYE	IMS_A forwards BYE to AS/IM_A
121												BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
122												BYE	IMS_A forwards BYE to IBCF_A
123												BYE	IBCF_A forwards BYE to IBCF_B
124												BYE	IBCF_B forwards BYE to IMS_B
125												BYE	IMS_B forwards BYE to AS/IM_B
126												200 OK	AS/IM_B sends 200 OK for BYE
127												200 OK	IMS_B forwards 200 OK response to IBCF_B
128												200 OK	IBCF_B forwards 200 OK response to IBCF_A
129												200 OK	IBCF_A forwards 200 OK response to IMS_A
130												200 OK	IMS_A forwards 200 OK response to AS/IM_A
131												200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
132												200 OK	IMS_A forwards 200 OK response to UE_C
133													User C is informed that the Ad-hoc IM Conference has ended
134												NOTIFY	AS/IM_B sends NOTIFY to IMS_B to inform UE_B that User C has left the Ad-hoc IM Conference
135												NOTIFY	IMS_B forwards NOTIFY to IBCF_B
136												NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
137												NOTIFY	IBCF_A forwards NOTIFY to IMS_A
138												NOTIFY	IMS_A forwards NOTIFY to UE_B
139													User B is notified that User C has left the Ad-hoc IM Conference
140												200 OK	UE_B responds with 200 OK to IMS_A
141												200 OK	IMS_A forwards 200 OK response to IBCF_A
142												200 OK	IBCF_A forwards 200 OK response to IBCF_B
143												200 OK	IBCF_B forwards 200 OK response to IMS_B
144												200 OK	IMS_B forwards 200 OK response to AS/IM_B
													Continue UC_RCS_4_R (65A-91B)

## 4.4.4 Content Sharing

Following there are the expected common call flow sequences for content sharing.

### 4.4.4.1 UC\_RCS\_11\_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	CFW
1A	User A establishes voice call with user B	Step 1A
1B	User A establishes voice call with user B	Step 1B
2	User B is informed of content sharing capabilities of user A	Step 12
3	User A is informed on content sharing capabilities of user B	Step 23
4	User A requests to share content with user B	Step 24
5	User B is requested to accept to share content	Step 35
6	User B accepts to share content with user A	Step 41
7	User A is informed that request has been answered	Step 47
8	Content sharing starts	Step 53
9A	User A ends content sharing	Step 54A
10A	User B is informed that content sharing has terminated	Step 60A
11A	User A is informed that content sharing has terminated	Step 66A
12A	User A initiates voice call termination	Step 67A
9B	User A ends content sharing	Step 54B
10B	User B is informed that content sharing has terminated	Step 60B
11B	User A is informed that content sharing has terminated	Step 66B
12B	User A initiates voice call termination	Step 67B
NOTE: The content sharing information can be exchanged in any order (first user A then user B or vice versa) or can take place in parallel at the same time.		

Step	Direction									Message	Comment
	U s e r A	U E A	I M S A	I B C F A	I B C F B	I M S B	U E B	U s e r B			
1A											User A establishes a voice call to user B
1B											User B establishes a voice call to user A
2										OPTIONS	UE_A sends OPTIONS to IMS_A
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										200 OK	UE_B responds with 200 OK to IMS_B
8										200 OK	IMS_B forwards 200 OK to IBCF_B
9										200 OK	IBCF_B forwards 200 OK to IBCF_A
10										200 OK	IBCF_A forwards 200 OK to IMS_A
11										200 OK	IMS_A forwards 200 OK to UE_A
12											User A is informed on content sharing capabilities of user B
13										OPTIONS	UE_B sends OPTIONS to IMS_B
14										OPTIONS	IMS_B forwards OPTIONS to IBCF_B
15										OPTIONS	IBCF_B forwards OPTIONS to IBCF_A
16										OPTIONS	IBCF_A forwards OPTIONS to IMS_A
17										OPTIONS	IMS_A forwards OPTIONS to UE_A
18										200 OK	UE_A responds 200 OK to IMS_A
19										200 OK	IMS_A forwards 200 OK to IBCF_A
20										200 OK	IBCF_A forwards 200 OK to IBCF_B
21										200 OK	IBCF_B forwards 200 OK to IMS_B
22										200 OK	IMS_B forwards 200 OK to UE_B

Step	Direction									Message	Comment
	U s e r A	U E A	I M S A	I B C F A	I B C F B	I M S B	U E B	U s e r B			
23											User B is informed of content sharing capabilities of user A
24											User A requests to share content with user B
25										INVITE	UE_A sends INVITE to share content with user B
26										100 Trying	IMS_A responds with a 100 Trying provisional response
27										INVITE	IMS_A forwards INVITE to IBCF_A
28										100 Trying	IBCF_A responds with a 100 Trying provisional response
29										INVITE	IBCF_A forwards INVITE to IBCF_B
30										100 Trying	IBCF_B responds with a 100 Trying provisional response
31										INVITE	IBCF_B forwards INVITE to IMS_B
32										100 Trying	IMS_B responds with a 100 Trying provisional response
33										INVITE	IMS_B forwards INVITE to UE_B
34										100 Trying	UE_B responds with a 100 Trying provisional response
35											User B is requested to accept to share content
36										180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting
37										180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
38										180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
39										180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
40										180 Ringing	IMS_A forwards the 180 Ringing response to UE_A
41											User B accepts to share content
42										200 OK	UE_B responds INVITE with 200 OK to indicate that the request has been accepted
43										200 OK	IMS_B forwards 200 OK response to IBCF_B
44										200 OK	IBCF_B forwards 200 OK response to IBCF_A
45										200 OK	IBCF_A forwards 200 OK response to IMS_A
46										200 OK	IMS_A forwards 200 OK response to UE_A
47											User A is informed that request has been answered
48										ACK	UE_A acknowledges the receipt of 200 OK for INVITE
49										ACK	IMS_A forwards ACK to IBCF_A
50										ACK	IBCF_A forwards ACK to IBCF_B
51										ACK	IBCF_B forwards ACK to IMS_B
52										ACK	IMS_B forwards ACK to UE_B
53											Content sharing starts
54A											User A ends content sharing
55A										BYE	UE_A releases the call with BYE
56A										BYE	IMS_A forwards BYE to IBCF_A
57A										BYE	IBCF_A forwards BYE to IBCF_B
58A										BYE	IBCF_B forwards BYE to IMS_B
59A										BYE	IMS_B forwards BYE to UE_B
60A											User B is informed that content sharing has ended
61A										200 OK	UE_B sends 200 OK for BYE
62A										200 OK	IMS_B forwards 200 OK response to IBCF_B
63A										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		
64A			←						200 OK	IBCF_A forwards 200 OK response to IMS_A
65A		←							200 OK	IMS_A forwards the 200 OK response to UE_A
66A										User A is informed that content sharing has ended
67A	←									Voice call termination initiated by user A
54B								←		User B ends content sharing
55B								←	BYE	UE_B releases the call with BYE
56B								←	BYE	IMS_B forwards BYE to IBCF_B
57B								←	BYE	IBCF_B forwards BYE to IBCF_A
58B								←	BYE	IBCF_A forwards BYE to IMS_A
59B		←							BYE	IMS_A forwards BYE to UE_A
60B	←									User A is informed that content sharing has ended
61B		→							200 OK	UE_A sends 200 OK for BYE
62B			→						200 OK	IMS_A forwards 200 OK response to IBCF_A
63B				→					200 OK	IBCF_A forwards 200 OK response to IBCF_B
64B					→				200 OK	IBCF_B forwards 200 OK response to IMS_B
65B						→			200 OK	IMS_B forwards the 200 OK response to UE_B
66B								→		User B is informed that content sharing has ended
67B										Voice call termination initiated by user B

#### 4.4.4.2 UC\_RCS\_11\_R: SIP message flow for Content Sharing with CF\_ROAMT\_CALL

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

Step	Action	CFW
1A	User A establishes voice call with user B	Step 1A
1B	User A establishes voice call with user B	Step 1B
2	User B is informed of content sharing capabilities of user A	Step 12
3	User A is informed on content sharing capabilities of user B	Step 23
4	User A requests to share content with user B	Step 24
5	User B is requested to accept to share content	Step 35
6	User B accepts to share content with user A	Step 41
7	User A is informed that request has been answered	Step 47
8	Content sharing starts	Step 53
9A	User A ends content sharing	Step 54A
10A	User B is informed that content sharing has terminated	Step 60A
11A	User A is informed that content sharing has terminated	Step 66A
12A	User A initiates voice call termination	Step 67A
9B	User A ends content sharing	Step 54B
10B	User B is informed that content sharing has terminated	Step 60B
11B	User A is informed that content sharing has terminated	Step 66B
12B	User A initiates voice call termination	Step 67B

Step	Direction								Message	Comment
	U s e r A	U E A	I M S A	I B C F A	I B C F B	I M S B	U E B	U s e r B		
1A										User A sets up a voice call to user B
1B										User B sets up a voice call to user A
2									OPTIONS	UE_A sends OPTIONS to IMS_A
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									200 OK	UE_B responds with 200 OK to IMS_A
11									200 OK	IMS_A forwards 200 OK to IBCF_A
12									200 OK	IBCF_A forwards 200 OK to IBCF_B
13									200 OK	IBCF_B forwards 200 OK to IMS_B
14									200 OK	IMS_B forwards 200 OK to IBCF_B
15									200 OK	IBCF_B forwards 200 OK to IBCF_A
16									200 OK	IBCF_A forwards 200 OK to IMS_A
17									200 OK	IMS_A forwards 200 OK to UE_A
18										User A is informed on content sharing capabilities of user B
19									OPTIONS	UE_B sends OPTIONS to IMS_A
20									OPTIONS	IMS_A forwards OPTIONS to IBCF_A
21									OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
22									OPTIONS	IBCF_B forwards OPTIONS to IMS_B
23									OPTIONS	IMS_B forwards OPTIONS to IBCF_B
24									OPTIONS	IBCF_B forwards OPTIONS to IBCF_A
25									OPTIONS	IBCF_A forwards OPTIONS to IMS_A
26									OPTIONS	IMS_A forwards OPTIONS to UE_A
27									200 OK	UE_A responds 200 OK to IMS_A
28									200 OK	IMS_A forwards 200 OK to IBCF_A
29									200 OK	IBCF_A forwards 200 OK to IBCF_B
30									200 OK	IBCF_B forwards 200 OK to IMS_B
31									200 OK	IMS_B forwards 200 OK to IBCF_B
32									200 OK	IBCF_B forwards 200 OK to IBCF_A
33									200 OK	IBCF_A forwards 200 OK to IMS_A
34									200 OK	IMS_A forwards 200 OK to UE_B
35										User B is informed of content sharing capabilities of user A
36										User A requests to share content with user B
37									INVITE	UE_A sends INVITE to share content with user B
38									100 Trying	IMS_A responds with a 100 Trying provisional response
39									INVITE	IMS_A forwards INVITE to IBCF_A
40									100 Trying	IBCF_A responds with a 100 Trying provisional response
41									INVITE	IBCF_A forwards INVITE to IBCF_B
42									100 Trying	IBCF_B responds with a 100 Trying provisional response
43									INVITE	IBCF_B forwards INVITE to IMS_B
44									100 Trying	IMS_B responds with a 100 Trying provisional response
45									INVITE	IMS_B forwards INVITE to IBCF_B
46									100 Trying	IBCF_B responds with a 100 Trying provisional response



Step	Direction									Message	Comment
	U s e r A	U E A	I M S A	I B C F A	I B C F B	I M S B	U E B	U s e r B			
47					←					INVITE	IBCF_B forwards INVITE to IBCF_A
48					→					100 Trying	IBCF_A responds with a 100 Trying provisional response
49				←						INVITE	IBCF_A forwards INVITE to IMS_A
50				→						100 Trying	IMS_A responds with a 100 Trying provisional response
51				→						INVITE	IMS_A forwards INVITE to UE_B
52				←						100 Trying	UE_B responds with a 100 Trying provisional response
53									→		User B is requested to accept to share content
54				←						180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting
55				→						180 Ringing	IMS_A forwards 180 Ringing response to IBCF_A
56				→						180 Ringing	IBCF_A forwards 180 Ringing response to IBCF_B
57				→						180 Ringing	IBCF_B forwards 180 Ringing response to IMS_B
58				←						180 Ringing	IMS_B forwards the 180 Ringing response to IBCF_B
59				←						180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
60				←						180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
61		←								180 Ringing	IMS_A forwards 180 Ringing response to UE_A
62									←		User B accepts to share content
63				←						200 OK	UE_B responds INVITE with 200 OK to indicate that the request has been accepted
64				→						200 OK	IMS_A forwards 200 OK response to IBCF_A
65				→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
66				→						200 OK	IBCF_B forwards 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		←									IMS_A forwards 200 OK response to UE_A
71	←										User A is informed that request has been answered
72		→								ACK	UE_A acknowledges the receipt of 200 OK for INVITE
73		→								ACK	IMS_A forwards ACK to IBCF_A
74		→								ACK	IBCF_A forwards ACK to IBCF_B
75		→								ACK	IBCF_B forwards ACK to IMS_B
76		←								ACK	IMS_B forwards ACK to IBCF_B
77		←								ACK	IBCF_B forwards ACK to IBCF_A
78		←								ACK	IBCF_A forwards ACK to IMS_A
79		→								ACK	IMS_A forwards ACK to UE_B
80											Content sharing starts
81A	←										User A ends content sharing
82A		→								BYE	UE_A releases the call with BYE
83A		→								BYE	IMS_A forwards BYE to IBCF_A
84A		→								BYE	IBCF_A forwards BYE to IBCF_B
85A		→								BYE	IBCF_B forwards BYE to IMS_B
86A		←								BYE	IMS_B forwards BYE to IBCF_B
87A		←								BYE	IBCF_B forwards BYE to IBCF_A
88A		←								BYE	IBCF_A forwards BYE to IMS_A
89A		→								BYE	IMS_A forwards BYE to UE_B

Step	Direction									Message	Comment
	U s e r A	U E A	I M S A	I B C F A	I B C F B	I M S B	U E B	U s e r B			
90A											User B is informed that content sharing has ended
91A										200 OK	UE_B sends 200 OK for BYE
92A										200 OK	IMS_A forwards 200 OK response to IBCF_A
93A										200 OK	IBCF_A forwards 200 OK response to IBCF_B
94A										200 OK	IBCF_B forwards 200 OK response to IMS_B
95A										200 OK	IMS_B forwards the 200 OK response to IBCF_B
96A										200 OK	IBCF_B forwards 200 OK response to IBCF_A
97A										200 OK	IBCF_A forwards 200 OK response to IMS_A
98A										200 OK	IMS_A forwards the 200 OK response to UE_A
99A											Content sharing terminates
100A											User A terminates voice call
81B											User B ends content sharing
82B										BYE	UE_B releases the call with BYE
83B										BYE	IMS_A forwards BYE to IBCF_A
84B										BYE	IBCF_A forwards BYE to IBCF_B
85B										BYE	IBCF_B forwards BYE to IMS_B
86B										BYE	IMS_B forwards BYE to IBCF_B
87B										BYE	IBCF_B forwards BYE to IBCF_A
88B										BYE	IBCF_A forwards BYE to IMS_A
89B										BYE	IMS_A forwards BYE to UE_A
90B											User A is informed that content sharing has ended
91B										200 OK	UE_A sends 200 OK for BYE
92B										200 OK	IMS_A forwards 200 OK response to IBCF_A
93B										200 OK	IBCF_A forwards 200 OK response to IBCF_B
94B										200 OK	IBCF_B forwards 200 OK response to IMS_B
95B										200 OK	IMS_B forwards 200 OK response to IBCF_B
96B										200 OK	IBCF_B forwards 200 OK response to IBCF_A
97B										200 OK	IBCF_A forwards 200 OK response to IMS_A
98B										200 OK	IMS_A forwards the 200 OK response to UE_B
99B											Content sharing terminates
100B											User B terminates voice call

## 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 [11] 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 associated with 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].

## 4.5.1 Social Presence

## 4.5.1.1 Watcher subscription for presence event notification in visited network

Interoperability Test Description		
<b>Identifier:</b>	TD_IMS_PRES_0001	
<b>Summary:</b>	IMS network supports properly presence service when a watcher subscribes to presence information for a presentity that it's located in a different network.	
<b>Configuration:</b>	CF_ROAM_AS	
<b>SUT</b>	IMS_B	
<b>References</b>	<b>Test Purpose</b>	<b>Specification Reference</b>
	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
<b>Use Case ref.:</b>	UC_RCS_2_R	
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>• HSS of IMS_A and of IMS B is configured according to table 1</li> <li>• UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>• UE_A is registered in IMS_A using userPRES according to table 1</li> <li>• UE_B is registered in IMS_B via IMS A using userPRES according to table 1</li> <li>• UE_A is configured to receive notifications with watcher information</li> <li>• IMS_A is configured to contact AS_A</li> <li>• IMS_B is configured to contact AS_B</li> <li>• AS_Bis configured for reactive authorization</li> <li>• IMS_A is within the trust domain of IMS_B</li> <li>• IMS_A not configured for topology hiding</li> </ul>	
<b>Test Sequence:</b>	<b>Step</b>	
	1	User B publishes presence information
	2	Verify that user B is informed of its presence status update
	3	User A subscribes to presence information from User B
	4	Verify that user B receives an authorization request from user A to see its own presence information
	5	User B authorizes user A to be informed of its own presence information
	6	Verify that user A is informed of user A presence information
<b>Conformance Criteria:</b>	<b>Check</b>	
	1	TP_IMS_5097_13 in CFW step 6 (PUBLISH): ensure that { when {IMS_B receives a PUBLISH from IMS_A } then { IMS_B 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 access-network-charging-info } }
	2	TP_IMS_5108_07 in CFW step 18 (SUBSCRIBE): ensure that { when { IMS_A receives a SUBSCRIBE addressed to UE_B } then { IMS_B sends the SUBSCRIBE to AS_B containing a topmost Route header indicating the SIP URI of AS_B containing a Route header indicating the S-CSCF_SIP URI of IMS_B 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 19 (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
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
1												User B publishes presence 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
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 A subscribes to presence information from User B
14												SUBSCRIBE UE_A sends SUBSCRIBE for "presence" event to IMS_A
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_A
24												NOTIFY IMS_B AS sends NOTIFY to IBCF_B

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
25					←							NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
26				←								NOTIFY	IBCF_A forwards NOTIFY to IMS_A
27		←										NOTIFY	IMS_A forwards the NOTIFY to UE_A
28			→									200 OK	UE_A responds with a 200 OK to IMS_A
29				→								200 OK	IMS_A forwards the 200 OK to IBCF_A
30					→							200 OK	IBCF_A forwards the 200 OK to IBCF_B
31						→						200 OK	IBCF_B forwards the 200 OK response to IMS_B AS
32													SUBSCRIPTION triggers the AS to send a NOTIFY to UE_B indicating the change to the watcher information subscriber
33								←				NOTIFY	IMS_B AS sends NOTIFY to IMS_B to indicate UE_B the change to the watcher information subscriber
34						←						NOTIFY	IMS_B forwards the NOTIFY to IBCF_B
35						←						NOTIFY	IBCF_B forwards the NOTIFY to IBCF_A
36				←								NOTIFY	IBCF_A forwards the NOTIFY to IMS_A
37									→			NOTIFY	IMS_A forwards the NOTIFY to UE_B
38				←								200 OK	UE_B responds with a 200 OK to IMS_A
39				→								200 OK	IMS_A forwards the 200 OK response to IBCF_A
40					→							200 OK	IBCF_A forwards the 200 OK response to IBCF_B
41						→							IBCF_B forwards the 200 OK response to IMS_B
42								→				200 OK	IMS_B forwards the 200 OK response to IMS_B AS
43													User B receives an authorization request from User A to see its own presence information

#### 4.5.1.2 Watcher subscription to presence event notification in home network

Interoperability Test Description							
<b>Identifier:</b>	TD_IMS_PRESEN_0002						
<b>Summary:</b>	IMS network supports properly presence service when a watcher subscribes to presence information for a presentity that it's located in a different network.						
<b>Configuration:</b>	CF_INT_AS						
<b>SUT</b>	IMS_A						
<b>References</b>	<table border="1"> <thead> <tr> <th>Test Purpose</th> <th>Specification Reference</th> </tr> </thead> <tbody> <tr> <td>TP_IMS_5108_07</td> <td>TS 124 229 [1], clause 5.4.3.3 ¶1</td> </tr> <tr> <td>TP_IMS_5115_08</td> <td>TS 124 229 [1], clause 5.4.3.3 ¶65</td> </tr> </tbody> </table>	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
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						
<b>Use Case ref.:</b>	UC_RCS_2_I						

Interoperability Test Description															
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userPRES according to table 1</li> <li>UE_B is registered in IMS_B using userPRES according to table 1</li> <li>UE_B is configured to receive notifications with watcher information</li> <li>AS_B is configured for reactive authorization</li> <li>IMS_A is configured to contact AS_A (PS)</li> <li>IMS_A is within the trust domain of IMS_B</li> <li>IMS_A not configured for topology hiding</li> </ul>														
<b>Test Sequence:</b>	<table border="1"> <thead> <tr> <th>Step</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>User B publishes presence information</td> </tr> <tr> <td>2</td> <td>Verify that user B is informed of its presence status update</td> </tr> <tr> <td>3</td> <td>User A subscribes to presence information from User B</td> </tr> <tr> <td>4</td> <td>Verify that user B receives an authorization request from User A to see its own presence information</td> </tr> <tr> <td>5</td> <td>User B authorizes user A to be informed of its own presence information</td> </tr> <tr> <td>6</td> <td>Verify that user A is informed of user B presence information</td> </tr> </tbody> </table>	Step		1	User B publishes presence information	2	Verify that user B is informed of its presence status update	3	User A subscribes to presence information from User B	4	Verify that user B receives an authorization request from User A to see its own presence information	5	User B authorizes user A to be informed of its own presence information	6	Verify that user A is informed of user B presence information
Step															
1	User B publishes presence information														
2	Verify that user B is informed of its presence status update														
3	User A subscribes to presence information from User B														
4	Verify that user B receives an authorization request from User A to see its own presence information														
5	User B authorizes user A to be informed of its own presence information														
6	Verify that user A is informed of user B presence information														
<b>Conformance Criteria:</b>	<table border="1"> <thead> <tr> <th>Check</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>TP_IMS_5108_07 in CFW step 12 (SUBSCRIBE): ensure that { when { IMS_A receives a SUBSCRIBE addressed to UE_B } then { IMS_B sends the SUBSCRIBE to AS_B containing a topmost Route header indicating the SIP URI of AS_B containing a Route header indicating the S-CSCF_SIP URI of IMS_B containing a P-Charging-Vector_header containing an orig-voi parameter indicating IMS_A and not containing a term-voi parameter } } }</td> </tr> <tr> <td>2</td> <td>TP_IMS_5115_08 in CFW step 13 (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 an orig-voi_parameter indicating IMS_A and containing a term-voi_parameter indicating IMS_B } } }</td> </tr> </tbody> </table>	Check		1	TP_IMS_5108_07 in CFW step 12 (SUBSCRIBE): ensure that { when { IMS_A receives a SUBSCRIBE addressed to UE_B } then { IMS_B sends the SUBSCRIBE to AS_B containing a topmost Route header indicating the SIP URI of AS_B containing a Route header indicating the S-CSCF_SIP URI of IMS_B containing a P-Charging-Vector_header containing an orig-voi parameter indicating IMS_A and not containing a term-voi parameter } } }	2	TP_IMS_5115_08 in CFW step 13 (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 an orig-voi_parameter indicating IMS_A and containing a term-voi_parameter indicating IMS_B } } }								
Check															
1	TP_IMS_5108_07 in CFW step 12 (SUBSCRIBE): ensure that { when { IMS_A receives a SUBSCRIBE addressed to UE_B } then { IMS_B sends the SUBSCRIBE to AS_B containing a topmost Route header indicating the SIP URI of AS_B containing a Route header indicating the S-CSCF_SIP URI of IMS_B containing a P-Charging-Vector_header containing an orig-voi parameter indicating IMS_A and not containing a term-voi parameter } } }														
2	TP_IMS_5115_08 in CFW step 13 (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 an orig-voi_parameter indicating IMS_A and containing a term-voi_parameter indicating IMS_B } } }														

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
1												User B publishes presence information	
2												PUBLISH	UE_B sends PUBLISH with information for all commonly supported presence 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 IBCF_B
6													User B is informed of its presence status update
7													User A subscribes to presence information from User B

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
8											SUBSCRIBE	UE_A sends SUBSCRIBE for "presence" event to IMS_A
9											SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IBCF_A
10											SUBSCRIBE	IBCF_A forwards the SUBSCRIBE to IBCF_B
11											SUBSCRIBE	IBCF_B forwards the SUBSCRIBE to IMS_B
12											SUBSCRIBE	IMS_B forwards the SUBSCRIBE to IMS_B AS (PS)
13											200 OK	IMS_B AS responds with a 200 OK to IMS_B
14											200 OK	IMS_B forwards the 200 OK response to IBCF_B
15											200 OK	IBCF_B forwards the 200 OK response to IBCF_A
16											200 OK	IBCF_A forwards the 200 OK response to IMS_A
17											200 OK	IMS_A forwards the 200 OK response to UE_A
18											NOTIFY	IMS_B AS sends NOTIFY to IBCF_B
19											NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
20											NOTIFY	IBCF_A forwards NOTIFY to IMS_A
21											NOTIFY	IMS_A forwards the NOTIFY to UE_A
22											200 OK	UE_A responds with a 200 OK to IMS_A
23											200 OK	IMS_A forwards the 200 OK to IBCF_A
24											200 OK	IBCF_A forwards the 200 OK to IBCF_B
25											200 OK	IBCF_B forwards the 200 OK response to IMS_B AS
26												SUBSCRIPTION triggers the AS to send a NOTIFY to UE_B indicating the change to the watcher information subscriber
27											NOTIFY	IMS_B AS sends NOTIFY to IMS_B to indicate UE_B the change to the watcher information subscriber
28											NOTIFY	IMS_B forwards the NOTIFY to UE_B
29											200 OK	UE_B responds with a 200 OK to IMS_B
30											200 OK	IMS_B forwards the 200 OK response to IMS_B AS
31												User B receives an authorization request from User A to see its own presence information

### 4.5.1.3 Unsuccessful watcher subscription to presence event notification in home network

Interoperability Test Description							
<b>Identifier:</b>	TD_IMS_PRES_0003						
<b>Summary:</b>	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.						
<b>Configuration:</b>	CF_INT_AS						
<b>SUT</b>	IMS_B						
<b>References</b>	<table border="1"> <thead> <tr> <th>Test Purpose</th> <th>Specification Reference</th> </tr> </thead> <tbody> <tr> <td>TP_IMS_5108_07</td> <td>TS 124 229 [1], clause 5.4.3.3 ¶1</td> </tr> </tbody> </table>	Test Purpose	Specification Reference	TP_IMS_5108_07	TS 124 229 [1], clause 5.4.3.3 ¶1		
Test Purpose	Specification Reference						
TP_IMS_5108_07	TS 124 229 [1], clause 5.4.3.3 ¶1						
<b>Use Case ref.:</b>	UC_RCS_2_I						
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userPRES according to table 1</li> <li>UE_B is registered in IMS_B using userPRES according to table 1</li> <li>UE_A is not authorized to see the presence of UE_B</li> <li>IMS_B is configured to contact AS_B (PS)</li> <li>IMS_A is within the trust domain of IMS_B</li> <li>IMS_A not configured for topology hiding</li> </ul>						
<b>Test Sequence:</b>	<table border="1"> <thead> <tr> <th>Step</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>User A subscribes to presence information from User B</td> </tr> <tr> <td>2</td> <td>Verify that user A is not informed of user B presence information</td> </tr> </tbody> </table>	Step		1	User A subscribes to presence information from User B	2	Verify that user A is not informed of user B presence information
Step							
1	User A subscribes to presence information from User B						
2	Verify that user A is not informed of user B presence information						
<b>Conformance Criteria:</b>	<table border="1"> <thead> <tr> <th>Check</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>TP_IMS_5108_07 in CFW step 6 (SUBSCRIBE):  <i>ensure that {  when { IMS_A receives a SUBSCRIBE addressed to UE_B }  then { IMS_B sends the SUBSCRIBE to AS_B  containing a topmost Route header  indicating the SIP URI of AS_B  containing a Route header  indicating the S-CSCF_SIP URI of IMS_B  containing a P-Charging-Vector_header  containing an orig-ioi parameter indicating IMS_A and  not containing a term-ioi parameter }  }</i> </td> </tr> </tbody> </table>	Check		1	TP_IMS_5108_07 in CFW step 6 (SUBSCRIBE): <i>ensure that {  when { IMS_A receives a SUBSCRIBE addressed to UE_B }  then { IMS_B sends the SUBSCRIBE to AS_B  containing a topmost Route header  indicating the SIP URI of AS_B  containing a Route header  indicating the S-CSCF_SIP URI of IMS_B  containing a P-Charging-Vector_header  containing an orig-ioi parameter indicating IMS_A and  not containing a term-ioi parameter }  }</i>		
Check							
1	TP_IMS_5108_07 in CFW step 6 (SUBSCRIBE): <i>ensure that {  when { IMS_A receives a SUBSCRIBE addressed to UE_B }  then { IMS_B sends the SUBSCRIBE to AS_B  containing a topmost Route header  indicating the SIP URI of AS_B  containing a Route header  indicating the S-CSCF_SIP URI of IMS_B  containing a P-Charging-Vector_header  containing an orig-ioi parameter indicating IMS_A and  not containing a term-ioi parameter }  }</i>						

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
1													User A subscribes to presence information from User B
2												SUBSCRIBE	UE_A sends SUBSCRIBE for "presence" event to IMS_A
3												SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IBCF_A
4												SUBSCRIBE	IBCF_A forwards the SUBSCRIBE to IBCF_B
5												SUBSCRIBE	IBCF_B forwards the SUBSCRIBE to IMS_B
6												SUBSCRIBE	IMS_B forwards the SUBSCRIBE to IMS_B AS (PS)
7												2xx or 4xx response	IMS_B AS responds with a 2xx or 4xx to IMS_B
8												2xx or 4xx response	IMS_B forwards the 2xx or 4xx response to IBCF_B



Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
9						←						2xx or 4xx response	IBCF_B forwards the 2xx or 4xx response to IBCF_A
10					←							2xx or 4xx response	IBCF_A forwards the 2xx or 4xx response to IMS_A
11		←										2xx or 4xx response	IMS_A forwards the 2xx or 4xx response to UE_A
12													User A is not informed of user B presence information

#### 4.5.1.4 Watcher subscription to resource list in visited network

Interoperability Test Description											
<b>Identifier:</b>	TD_IMS_PRES_0004										
<b>Summary:</b>	IMS network supports properly presence service when a watcher subscribes to a resource list containing one or more presentities located in different networks.										
<b>Configuration:</b>	CF_ROAM_AS										
<b>SUT</b>	IMS_B										
<b>References</b>	<table border="1"> <thead> <tr> <th>Test Purpose</th> <th>Specification Reference</th> </tr> </thead> <tbody> <tr> <td>TP_IMS_5097_13</td> <td>TS 124 229 [1], clause 5.4.3.2 ¶1</td> </tr> <tr> <td>TP_IMS_5108_07</td> <td>TS 124 229 [1], clause 5.4.3.3 ¶1</td> </tr> <tr> <td>TP_IMS_5313_01</td> <td>TS 124 229 [1], clause 5.4.6.1.3 ¶2</td> </tr> </tbody> </table>	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		
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										
<b>Use Case ref.:</b>	UC_RCS_3_R										
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userPRES according to table 1</li> <li>UE_B is registered in IMS_B via IMS A using userPRES according to table 1</li> <li>UE_A is authorized to see UE_B presence information</li> <li>UE_A is authorized to use the resource list userPRES_list:</li> <li>IMS_A is within the trust domain of IMS_B</li> <li>IMS_B is configured to contact AS_B (PS)</li> <li>IMS_A, IMS_B not configured for topology hiding</li> </ul>										
<b>Test Sequence:</b>	<table border="1"> <thead> <tr> <th>Step</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>User B publishes presence information</td> </tr> <tr> <td>2</td> <td>Verify that user B is informed of its presence status update</td> </tr> <tr> <td>3</td> <td>User A subscribes to resource list userPRES_list containing User B SIP URI</td> </tr> <tr> <td>4</td> <td>Verify that user A sees user B presence information</td> </tr> </tbody> </table>	Step		1	User B publishes presence information	2	Verify that user B is informed of its presence status update	3	User A subscribes to resource list userPRES_list containing User B SIP URI	4	Verify that user A sees user B presence information
Step											
1	User B publishes presence information										
2	Verify that user B is informed of its presence status update										
3	User A subscribes to resource list userPRES_list containing User B SIP URI										
4	Verify that user A sees user B presence information										
<b>Conformance Criteria:</b>	<table border="1"> <thead> <tr> <th>Check</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>TP_IMS_5097_13 in CFW step 6 (PUBLISH): ensure that { when {IMS_B receives a PUBLISH from IMS_A } then { IMS_B 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-voi parameter indicating IMS_A and not containing a term-voi parameter and containing [(a-z)] [(a-z)]ccess-network-charging-info} }</td> </tr> </tbody> </table>	Check		1	TP_IMS_5097_13 in CFW step 6 (PUBLISH): ensure that { when {IMS_B receives a PUBLISH from IMS_A } then { IMS_B 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-voi parameter indicating IMS_A and not containing a term-voi parameter and containing [(a-z)] [(a-z)]ccess-network-charging-info} }						
Check											
1	TP_IMS_5097_13 in CFW step 6 (PUBLISH): ensure that { when {IMS_B receives a PUBLISH from IMS_A } then { IMS_B 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-voi parameter indicating IMS_A and not containing a term-voi parameter and containing [(a-z)] [(a-z)]ccess-network-charging-info} }										

Interoperability Test Description	
<b>2</b>	<p>TP_IMS_5108_07 in CFW step 28 (SUBSCRIBE):</p> <p>ensure that {</p> <p>when { IMS_A receives a SUBSCRIBE addressed to UE_B }</p> <p>then { IMS_B sends the SUBSCRIBE to AS_B</p> <p style="padding-left: 20px;">containing a topmost Route header</p> <p style="padding-left: 20px;">indicating the SIP URI of AS_B</p> <p style="padding-left: 20px;">containing a Route header</p> <p style="padding-left: 20px;">indicating the S-CSCF_SIP URI of IMS_B</p> <p style="padding-left: 20px;">containing a P-Charging-Vector_header</p> <p style="padding-left: 20px;">containing an orig-voi parameter indicating IMS_A and</p> <p style="padding-left: 20px;">not containing a term-voi parameter }</p> <p>}</p>
<b>3</b>	<p>TP_IMS_5313_01 in CFW step 34 (200 OK)</p> <p>ensure that {</p> <p>when { IMS_A receives a response from IMS_B</p> <p style="padding-left: 20px;">containing a P-Charging-Vector_header</p> <p style="padding-left: 20px;">including an access-network-charging-info_parameter</p> <p>}</p> <p>then { IMS_A sends the response to AS_A</p> <p style="padding-left: 20px;">containing a P-Charging-Vector_header</p> <p style="padding-left: 20px;">including an access-network-charging-info_parameter</p> <p>}</p> <p>}}</p>

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
1												User B publishes presence 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
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 A subscribes to resource list
14											SUBSCRIBE	UE_A sends SUBSCRIBE for "presence" event to IMS_A indicating support to "eventlist" to a resource list SIP URI
15											SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IMS_A AS (RLS)

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
16												RLS performs authorization checks to ensure that User A is authorized to use resource lists
17												200 OK IMS_A AS responds with a 200 OK to IMS_A
18												200 OK IMS_A forwards the 200 OK response to UE_A
19												NOTIFY IMS_A AS sends NOTIFY to IMS_A
20												NOTIFY IMS_A forwards the NOTIFY to UE_A
21												200 OK UE_A responds with a 200 OK to IMS_A
22												200 OK IMS_A forwards the 200 OK response to IMS_A AS
23												RLS resolves watcher resource's address and subscribes for presence event notification for all the presentities represented by the resource list SIP URI
24												SUBSCRIBE IMS_A AS (RLS) sends SUBSCRIBE for "presence" event to IMS_A
25												SUBSCRIBE IMS_A forwards the SUBSCRIBE to IBCF_A
26												SUBSCRIBE IBCF_A forwards the SUBSCRIBE to IBCF_B
27												SUBSCRIBE IBCF_B forwards the SUBSCRIBE to IMS_B
28												SUBSCRIBE IMS_B forwards the SUBSCRIBE to IMS_B AS (PS)
29												PS performs authorization checks on the originator to ensure it is allowed to watch the presentity
30												200 OK IMS_B AS (PS) responds with a 200 OK to IMS_B
31												200 OK IMS_B forwards the 200 OK response to IBCF_B
32												200 OK IBCF_B forwards the 200 OK response to IBCF_A
33												200 OK IBCF_A forwards the 200 OK response to IMS_A
34												200 OK IMS_A forwards the 200 OK response to IMS_A AS (RLS)
35												NOTIFY IMS_B AS sends a NOTIFY to IBCF_B with the presence information of UE_B
36												NOTIFY IBCF_B forwards the NOTIFY to IBCF_A
37												IBCF_A forwards the NOTIFY to IMS_A
38												NOTIFY IMS_A forwards the NOTIFY to IMS_A AS (RLS)
39												200 OK IMS_A AS responds with a 200 OK to IMS_A
40												200 OK IMS_A forwards the 200 OK response to IBCF_A
41												200 OK IBCF_A forwards the 200 OK response to IBCF_B
42												200 OK IBCF_B forwards the 200 OK response to IMS_B AS

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
43												RLS notifies with presence information for all the presentities represented by the resource list SIP URI	
44				→								NOTIFY	IMS_A AS sends NOTIFY to IMS_A
45			←									NOTIFY	IMS_A forwards the NOTIFY to UE_A
46				→								200 OK	UE_A responds with a 200 OK to IMS_A
47				←								200 OK	IMS_A forwards the 200 OK response to IMS_A AS
48													User A sees user B presence information

#### 4.5.1.5 Watcher subscription to resource list in home network

Interoperability Test Description		
<b>Identifier:</b>	TD_IMS_PRES_0005	
<b>Summary:</b>	IMS network supports properly presence service when a watcher subscribes to a resource list containing one or more presentities located in different networks.	
<b>Configuration:</b>	CF_INT_AS	
<b>SUT</b>	IMS_A	
<b>References</b>	<b>Test Purpose</b>	<b>Specification Reference</b>
	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
<b>Use Case ref.:</b>	UC_RCS_3_I	
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS_B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userPRES according to table 1</li> <li>UE_B is registered in IMS_B using userPRES according to table 1</li> <li>UE_A is authorized to see UE_B presence information</li> <li>UE_A is authorized to use the resource list userPRES_list:</li> <li>IMS_A is within the trust domain of IMS_B</li> <li>IMS_A is configured to contact AS_A (RLS)</li> <li>IMS_B is configured to contact AS_B (PS)</li> <li>IMS_A, IMS_B not configured for topology hiding</li> </ul>	
<b>Test Sequence:</b>	<b>Step</b>	
	1	User B publishes presence information
	2	Verify that user B is informed of its presence status update
	3	User A subscribes to resource list containing User B SIP URI
	4	Verify that user A sees user B presence information

Interoperability Test Description		
Conformance Criteria:	Check 1	TP_IMS_5108_07 in CFW step 22 (SUBSCRIBE): ensure that { when { IMS_A receives a SUBSCRIBE addressed to UE_B } then { IMS_B sends the SUBSCRIBE to AS_B containing a topmost Route header indicating the SIP URI of AS_B containing a Route header indicating the S-CSCF_SIP URI of IMS_B containing a P-Charging-Vector_header containing an orig-voi parameter indicating IMS_A and not containing a term-voi parameter } } }
	Check 2	TP_IMS_5313_01 in CFW step 28 (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		
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B				
1													User B publishes presence information	
2													PUBLISH	UE_B sends PUBLISH with information for all commonly supported presence 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 A subscribes to resource list
8													SUBSCRIBE	UE_A sends SUBSCRIBE for "presence" event to IMS_A indicating support to "eventlist" to a resource list SIP URI
9													SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IMS_A AS (RLS)
10														RLS performs authorization checks to ensure that User A is authorized to use resource lists
11													200 OK	IMS_A AS responds with a 200 OK to IMS_A
12													200 OK	IMS_A forwards the 200 OK response to UE_A
13													NOTIFY	IMS_A AS sends NOTIFY to IMS_A
14													NOTIFY	IMS_A forwards the NOTIFY to UE_A
15													200 OK	UE_A responds with a 200 OK to IMS_A

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
16			←								200 OK	IMS_A forwards the 200 OK response to IMS_A AS
17												RLS resolves watcher resource's address and subscribes for presence event notification for all the presentities represented by the resource list SIP URI
18			→								SUBSCRIBE	IMS_A AS (RLS) sends SUBSCRIBE for "presence" event to IMS_A
19				→							SUBSCRIBE	IMS_A forwards the SUBSCRIBE to IBCF_A
20					→						SUBSCRIBE	IBCF_A forwards the SUBSCRIBE to IBCF_B
21						→					SUBSCRIBE	IBCF_B forwards the SUBSCRIBE to IMS_B
22							→				SUBSCRIBE	IMS_B forwards the SUBSCRIBE to IMS_B AS (PS)
23												PS performs authorization checks on the originator to ensure it is allowed to watch the presentity
24								←			200 OK	IMS_B AS (PS) responds with a 200 OK to IMS_B
25									←		200 OK	IMS_B forwards the 200 OK response to IBCF_B
26										←	200 OK	IBCF_B forwards the 200 OK response to IBCF_A
27											200 OK	IBCF_A forwards the 200 OK response to IMS_A
28			←								200 OK	IMS_A forwards the 200 OK response to IMS_A AS (RLS)
29											NOTIFY	IMS_B AS sends a NOTIFY to IBCF_B with the presence information of UE_B
30											NOTIFY	IBCF_B forwards the NOTIFY to IBCF_A
31												IBCF_A forwards the NOTIFY to IMS_A
32			←								NOTIFY	IMS_A forwards the NOTIFY to IMS_A AS (RLS)
33			→								200 OK	IMS_A AS responds with a 200 OK to IMS_A
34				→							200 OK	IMS_A forwards the 200 OK response to IBCF_A
35					→						200 OK	IBCF_A forwards the 200 OK response to IBCF_B
36											200 OK	IBCF_B forwards the 200 OK response to IMS_B AS
37												RLS notifies with presence information for all the presentities represented by the resource list SIP URI
38			→								NOTIFY	IMS_A AS sends NOTIFY to IMS_A
39			←								NOTIFY	IMS_A forwards the NOTIFY to UE_A
40			→								200 OK	UE_A responds with a 200 OK to IMS_A
41			←								200 OK	IMS_A forwards the 200 OK response to IMS_A AS

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
42												User A sees user B presence information

## 4.5.2 Chat (1-to-1)

### 4.5.2.1 Instant messaging with explicit user acceptance

#### 4.5.2.1.1 Instant messaging with explicit user acceptance - interworking

Interoperability Test Description		
<b>Identifier:</b>	TD_IMS_CHAT_0001	
<b>Summary:</b>	IMS network supports instant messaging (IM) service and messages exchange between two users in their home network can be performed. User B must explicitly accept the chat invitation.	
<b>Configuration:</b>	CF_INT_AS	
<b>SUT</b>	IMS_A and IMS_B	
<b>References</b>	<b>Test Purpose</b>	<b>Specification Reference</b>
	TP_IMS_5097_01	TS 124 229 [1], clause 5.4.3.2 ¶11 (1 <sup>st</sup> numbered list)
	TP_IMS_5108_03	TS 124 229 [1], clause 5.4.3.3 ¶5 (item 4 in 1 <sup>st</sup> numbered list)
	TP_IMS_5115_08	TS 124 229 [1], clause 5.4.3.3 ¶89 (4 <sup>th</sup> numbered list)
<b>Use Case ref.:</b>	UC_RCS_5_I	
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userIM according to table 1</li> <li>IMS_A is configured to contact AS/IM_A</li> <li>UE_B is registered in IMS_B using userIM according to table 1</li> <li>IMS_B is configured to contact AS/IM_B</li> <li>User A and B are subscribed to IM services</li> <li>UE_B supports interaction on chat invitation</li> <li>IMS_A within the trust domain of IMS_B</li> <li>IMS_A not configured for topology hiding</li> </ul>	
<b>Test Sequence:</b>	<b>Step</b>	
	1	User A invites user B to 1-to-1 chat session
	2	Verify that User B is informed of incoming 1-to-1 chat invitation
	3	Verify that User A is informed that invitation to 1-to-1 chat session has reached User B
	4	User B accepts the 1-to-1 chat invitation
	5	Verify that Users perform chatting
	6	User A ends the 1-to-1 chat session
	7	Verify that User B is informed that 1-to-1 chat session has ended
	8	Verify that User A is informed that 1-to-1 chat session is terminated

Interoperability Test Description		
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 { IMS_B receives an initial INVITE from IMS_A addressed_to UE_B } then { IMS_B 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 IMS_B and containing a P-Charging-Vector_header including a orig-ioi_parameter indicating operator_identifier of IMS_A and not including a term-ioi_parameter } }
	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
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
1	→											User A invites user B to 1-to-1 chat session
2		→									INVITE	UE_A sends INVITE with 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
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



Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
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 1-to-1 chat session
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												User A is informed that invitation to a 1-to-1 chat session has reached user B
31												User B accepts the invitation to an 1-to-1 chat session
32											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
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 AS/IM_A
39											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
40											200 OK	IMS_A forwards 200 OK response to UE_A

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
41												ACK	UE_A acknowledges the receipt of 200 OK for INVITE
42												ACK	IMS_A forwards ACK to AS/IM_A
43												ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
44												ACK	IMS_A forwards ACK to IBCF_A
45												ACK	IBCF_A forwards ACK to IBCF_B
46												ACK	IBCF_B forwards ACK to IMS_B
47												ACK	IMS_B forwards ACK to AS/IM_B
48												ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
49												ACK	IMS_B forwards ACK to UE_B
50													Users perform chatting
51A													User A ends the 1-to-1 chat session
52A												BYE	UE_A releases the 1-to-1 chat session with BYE
53A												BYE	IMS_A forwards BYE to AS/IM_A
54A												BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
55A												BYE	IMS_A forwards BYE to IBCF_A
56A												BYE	IBCF_A forwards BYE to IBCF_B
57A												BYE	IBCF_B forwards BYE to IMS_B
58A												BYE	IMS_B forwards BYE to AS/IM_B
59A												BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
60A												BYE	IMS_B forwards BYE to UE_B
61A													User B is informed that 1-to-1 chat session has ended
62A												200 OK	UE_B sends 200 OK for BYE
63A												200 OK	IMS_B forwards 200 OK response to AS/IM_B
64A												200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
65A												200 OK	IMS_B forwards 200 OK response to IBCF_B
66A												200 OK	IBCF_B forwards 200 OK response to IBCF_A
67A												200 OK	IBCF_A forwards 200 OK response to IMS_A
68A												200 OK	IMS_A forwards 200 OK response to AS/IM_A
69A												200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
70A												200 OK	IMS_A forwards 200 OK response to UE_A
71A													User A is informed that 1-to-1 chat session has ended

## 4.5.2.1.2 Instant messaging with explicit user acceptance - roaming

Interoperability Test Description		
<b>Identifier:</b>	TD_IMS_CHAT_0002	
<b>Summary:</b>	IMS network supports instant messaging (IM) service and messages exchange between two users, one user in its home network and one user roaming can be performed. User B must explicitly accept the chat invitation.	
<b>Configuration:</b>	CF_ROAM_AS	
<b>SUT</b>	IMS_A and IMS_B	
<b>References</b>	<b>Test Purpose</b>	<b>Specification Reference</b>
	TP_IMS_5046_01	TS 124 229 [1], clause 5.2.6.3.3 ¶1 (1 <sup>st</sup> 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 1 <sup>st</sup> numbered list)
<b>Use Case ref.:</b>	UC_RCS_5_R	
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>• HSS of IMS_A and of IMS B is configured according to table 1</li> <li>• UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>• UE_A is registered in IMS_A using userIM according to table 1</li> <li>• IMS_A is configured to contact AS/IM_A</li> <li>• UE_B is registered in IMS_B via IMS_A using userIM according to table 1</li> <li>• IMS_B is configured to contact AS/IM_B</li> <li>• User A and B are subscribed to IM services</li> <li>• UE_A supports interaction on chat invitation</li> <li>• IMS_A within the trust domain of IMS_B</li> <li>• IMS_A not configured for topology hiding</li> </ul>	
<b>Test Sequence:</b>	<b>Step</b>	
	1	User B invites user A to 1-to-1 chat session
	2	Verify that User A is informed of incoming 1-to-1 chat invitation
	3	Verify that User B is informed that invitation to 1-to-1 chat session has reached User A
	4	User A accepts the 1-to-1 chat invitation
	5	Verify that Users perform chatting
	6	User B ends the 1-to-1 chat session
	7	Verify that User A is informed that 1-to-1 chat session has ended
	8	Verify that User B is informed that 1-to-1 chat session is terminated
<b>Conformance Criteria:</b>	<b>Check</b>	
	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	
<b>2</b>	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 } }
<b>3</b>	TP_IMS_5097_09 in CFW step 10 (INVITE) ensure that { when { IMS_B receives an initial INVITE from IMS_A addressed to UE_A } then { IMS_B 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 (including a orig-ioi_parameter indicating operator_identifier of IMS_A and not including a term-ioi_parameter and including access-network-charging-info) } }

Step	Direction											Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
1													User B invites user A to 1-to-1 chat session
2												INVITE	UE_B sends INVITE to IMS_A with 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
21												100 Trying	AS/IM_A responds with a 100 Trying provisional response

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r 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 1-to-1 chat session
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									→			User B is informed that invitation to an 1-to-1 chat session has reached user A
40	→											User A accepts the invitation to an 1-to-1 chat session
41		→									200 OK	UE_A 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
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 IBCF_B

Step	Direction										Message	Comment		
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B				
50						←						200 OK	IBCF_B forwards 200 OK response to IBCF_A	
51					←							200 OK	IBCF_A forwards 200 OK response to IMS_A	
52											→	200 OK	IMS_A forwards 200 OK response to UE_B	
53					←							ACK	UE_B acknowledges the receipt of 200 OK for INVITE	
54					→							ACK	IMS_A forwards ACK to IBCF_A	
55						→						ACK	IBCF_A forwards ACK to IBCF_B	
56							→					ACK	IBCF_B forwards ACK to IMS_B	
57								→				ACK	IMS_B forwards ACK to AS/IM_B	
58									←			ACK	AS/IM_B returns, possibly modified, ACK to IMS_B	
59									←			ACK	IMS_B forwards ACK to IBCF_B	
60						←						ACK	IBCF_B forwards ACK to IBCF_A	
61					←							ACK	IBCF_A forwards ACK to IMS_A	
62					←							ACK	IMS_A forwards ACK to AS/IM_A	
63					→							ACK	AS/IM_A returns, possibly modified, ACK to IMS_A	
64		←										ACK	IMS_A forwards ACK to UE_A	
65	←										→		Users perform chatting	
66A											←		User B ends the 1-to-1 chat session	
67A											←		BYE	UE_B releases the 1-to-1 chat session with BYE
68A						→						BYE	IMS_A forwards BYE to IBCF_A	
69A							→					BYE	IBCF_A forwards BYE to IBCF_B	
70A								→				BYE	IBCF_B forwards BYE to IMS_B	
71A									→			BYE	IMS_B forwards BYE to AS/IM_B	
72A										←		BYE	AS/IM_B returns, possibly modified, BYE to IMS_B	
73A									←			BYE	IMS_B forwards BYE to IBCF_B	
74A						←						BYE	IBCF_B forwards BYE to IBCF_A	
75A					←							BYE	IBCF_A forwards BYE to IMS_A	
76A					←							BYE	IMS_A forwards BYE to AS/IM_A	
77A					→							BYE	AS/IM_A returns, possibly modified, BYE to IMS_A	
78A		←										BYE	IMS_A forwards BYE to UE_A	
79A	←												User A is informed that 1-to-1 chat session has ended	
80A												200 OK	UE_A sends 200 OK for BYE	
81A												200 OK	IMS_A forwards 200 OK response to AS/IM_A	
82A												200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A	
83A												200 OK	IMS_A forwards 200 OK response to IBCF_A	
84A												200 OK	IBCF_A forwards 200 OK response to IBCF_B	
85A												200 OK	IBCF_B forwards 200 OK response to IMS_B	
86A												200 OK	IMS_B forwards 200 OK response to AS/IM_B	
87A												200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B	
88A												200 OK	IMS_B forwards 200 OK response to IBCF_B	

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
89A					←							200 OK	IBCF_B forwards 200 OK response to IBCF_A
90A				←								200 OK	IBCF_A forwards 200 OK response to IMS_A
91A										→		200 OK	IMS_A forwards 200 OK response to UE_B
92A										⇒			User B is informed that 1-to-1 chat session has ended

#### 4.5.2.2 Instant Messaging with immediate acceptance

##### 4.5.2.2.1 Instant Messaging with immediate acceptance - interworking

Interoperability Test Description															
<b>Identifier:</b>	TD_IMS_CHAT_0003														
<b>Summary:</b>	IMS network supports instant messaging (IM) service and messages exchange between two users in their home network can be performed. Immediate response applies.														
<b>Configuration:</b>	CF_INT_AS														
<b>SUT</b>	IMS_A and IMS_B														
<b>References</b>	<table border="1"> <thead> <tr> <th>Test Purpose</th> <th>Specification Reference</th> </tr> </thead> <tbody> <tr> <td>TP_IMS_5097_01</td> <td>TS 124 229 [1], clause 5.4.3.2 ¶11 (1<sup>st</sup> numbered list)</td> </tr> <tr> <td>TP_IMS_5108_03</td> <td>TS 124 229 [1], clause 5.4.3.3 ¶5 (item 4 in 1<sup>st</sup> numbered list)</td> </tr> <tr> <td>TP_IMS_5115_08</td> <td>TS 124 229 [1], clause 5.4.3.3 ¶89 (4<sup>th</sup> numbered list)</td> </tr> </tbody> </table>	Test Purpose	Specification Reference	TP_IMS_5097_01	TS 124 229 [1], clause 5.4.3.2 ¶11 (1 <sup>st</sup> numbered list)	TP_IMS_5108_03	TS 124 229 [1], clause 5.4.3.3 ¶5 (item 4 in 1 <sup>st</sup> numbered list)	TP_IMS_5115_08	TS 124 229 [1], clause 5.4.3.3 ¶89 (4 <sup>th</sup> numbered list)						
Test Purpose	Specification Reference														
TP_IMS_5097_01	TS 124 229 [1], clause 5.4.3.2 ¶11 (1 <sup>st</sup> numbered list)														
TP_IMS_5108_03	TS 124 229 [1], clause 5.4.3.3 ¶5 (item 4 in 1 <sup>st</sup> numbered list)														
TP_IMS_5115_08	TS 124 229 [1], clause 5.4.3.3 ¶89 (4 <sup>th</sup> numbered list)														
<b>Use Case ref.:</b>	UC_RCS_4_I														
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userIM according to table 1</li> <li>IMS_A is configured to contact AS/IM_A</li> <li>UE_B is registered in IMS_B using userIM according to table 1</li> <li>IMS_B is configured to contact AS/IM_B</li> <li>User A and B are subscribed to IM services</li> <li>UE_B automatically answer on chat invitation</li> <li>IMS_A within the trust domain of IMS_B</li> <li>IMS_A not configured for topology hiding</li> </ul>														
<b>Test Sequence:</b>	<table border="1"> <thead> <tr> <th>Step</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>User A invites user B to 1-to-1 chat session</td> </tr> <tr> <td>2</td> <td>User B automatically accepts 1-to-1 chat invitation</td> </tr> <tr> <td>3</td> <td>Verify that users perform chatting</td> </tr> <tr> <td>4</td> <td>User A ends the chat session</td> </tr> <tr> <td>5</td> <td>Verify that User B is informed that 1-to-1 chat session has ended</td> </tr> <tr> <td>6</td> <td>Verify that User A is informed that 1-to-1 chat session is terminated</td> </tr> </tbody> </table>	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 ends the chat session	5	Verify that User B is informed that 1-to-1 chat session has ended	6	Verify that User A is informed that 1-to-1 chat session is terminated
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 ends the chat session														
5	Verify that User B is informed that 1-to-1 chat session has ended														
6	Verify that User A is informed that 1-to-1 chat session is terminated														

Interoperability Test Description	
Conformance Criteria:	Check
	<p><b>1</b></p> <p>TP_IMS_5097_01 in CFW step 10 (INVITE):  <i>ensure that {</i>  <i>when { UE_A sends an initial INVITE to UE_B }</i>  <i>then { IMS_B receives the initial INVITE</i>  <i>not containing a Route_header</i>  <i>indicating the S-CSCF_SIP_URI of IMS_A</i>  <i>containing a P-Charging-Vector_header</i>  <i>(containing an icid-value_parameter and</i>  <i>containing a orig-ioi_parameter indicating IMS_A and</i>  <i>not containing an access-network-charging-info_parameter and</i>  <i>not containing a term-ioi_parameter) and</i>  <i>containing a Record-Route_header</i>  <i>indicating the originating S-CSCF_SIP_URI }</i>  <i>}</i></p>
	<p><b>2</b></p> <p>TP_IMS_5108_03 in CFW step 14 (INVITE)  <i>ensure that {</i>  <i>when {IMS_B receives an initial INVITE from IMS_A addressed_to UE_B}</i>  <i>then {IMS_B sends the INVITE to AS_B</i>  <i>containing a topmost Route_header</i>  <i>indicating the SIP_URI of AS_B and</i>  <i>containing a Route_header</i>  <i>indicating the S-CSCF_SIP_URI of IMS_B and</i>  <i>containing a P-Charging-Vector_header</i>  <i>including a orig-ioi_parameter</i>  <i>indicating operator_identifier of IMS_A and</i>  <i>not including a term-ioi_parameter }</i>  <i>}</i></p>
	<p><b>3</b></p> <p>TP_IMS_5115_08 in CFW step 35 (200 OK)  <i>ensure that {</i>  <i>when { IMS_B receives 200_response from AS_B addressed to UE_A }</i>  <i>then { IMS_B sends the 200_response to IMS_A</i>  <i>containing a P-Charging-Vector_header</i>  <i>including a orig-ioi_parameter</i>  <i>indicating operator_identifier of IMS_A and</i>  <i>including a term-ioi_parameter</i>  <i>indicating operator_identifier of IMS_B }</i>  <i>}</i></p>

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
1	→											User A invites user B to 1-to-1 chat session
2		→									INVITE	UE_A sends INVITE with 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
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



Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
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 1-to-1 chat session
21											200 OK	UE_B responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and informs A-side with specific data for 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											ACK	UE_A acknowledges the receipt of 200 OK for INVITE
31											ACK	IMS_A forwards ACK to AS/IM_A
32											ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
33											ACK	IMS_A forwards ACK to IBCF_A
34											ACK	IBCF_A forwards ACK to IBCF_B
35											ACK	IBCF_B forwards ACK to IMS_B
36											ACK	IMS_B forwards ACK to AS/IM_B
37											ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
38											ACK	IMS_B forwards ACK to UE_B
39												Users perform chatting
40A												User A ends the 1-to-1 chat session
41A											BYE	UE_A releases the enhanced messaging session with BYE
42A											BYE	IMS_A forwards BYE to AS/IM_A
43A											BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
44A											BYE	IMS_A forwards BYE to IBCF_A
45A											BYE	IBCF_A forwards BYE to IBCF_B
46A											BYE	IBCF_B forwards BYE to IMS_B

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
47A												BYE	IMS_B forwards BYE to AS/IM_B
48A												BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
49A												BYE	IMS_B forwards BYE to UE_B
50A													User B is informed that 1-to-1 chat session has ended
51A												200 OK	UE_B sends 200 OK for BYE
52A												200 OK	IMS_B forwards 200 OK response to AS/IM_B
53A												200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
54A												200 OK	IMS_B forwards 200 OK response to IBCF_B
55A												200 OK	IBCF_B forwards 200 OK response to IBCF_A
56A												200 OK	IBCF_A forwards 200 OK response to IMS_A
57A												200 OK	IMS_A forwards 200 OK response to AS/IM_A
58A												200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
59A												200 OK	IMS_A forwards 200 OK response to UE_A
60A													User A is informed that 1-to-1 chat session has ended

#### 4.5.2.2.2 Instant Messaging with immediate acceptance - roaming

Interoperability Test Description									
<b>Identifier:</b>	TD_IMS_CHAT_0004								
<b>Summary:</b>	IMS network supports instant messaging (IM) service and messages exchange between two users, one user in its home network and one user roaming can be performed. Immediate response applies.								
<b>Configuration:</b>	CF_ROAM_AS								
<b>SUT</b>	IMS_A and IMS_B								
<b>References</b>	<table border="1"> <thead> <tr> <th>Test Purpose</th> <th>Specification Reference</th> </tr> </thead> <tbody> <tr> <td>TP_IMS_5046_01</td> <td>TS 124 229 [1], clause 5.2.6.3.3 ¶1 (1<sup>st</sup> numbered list)</td> </tr> <tr> <td>TP_IMS_5067_01</td> <td>TS 124 229 [1], clause 5.2.7.2 ¶5</td> </tr> <tr> <td>TP_IMS_5097_09</td> <td>TS 124 229 [1], clause 5.4.3.2 ¶11 (items 5 and 8 in 1<sup>st</sup> numbered list)</td> </tr> </tbody> </table>	Test Purpose	Specification Reference	TP_IMS_5046_01	TS 124 229 [1], clause 5.2.6.3.3 ¶1 (1 <sup>st</sup> 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 1 <sup>st</sup> numbered list)
Test Purpose	Specification Reference								
TP_IMS_5046_01	TS 124 229 [1], clause 5.2.6.3.3 ¶1 (1 <sup>st</sup> 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 1 <sup>st</sup> numbered list)								
<b>Use Case ref.:</b>	UC_RCS_4_R								
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userIM according to table 1</li> <li>IMS_A is configured to contact AS/IM_A</li> <li>UE_B is registered in IMS_B via IMS_A using userIM according to table 1</li> <li>IMS_B is configured to contact AS/IM_B</li> <li>User A and B are subscribed to IM services</li> <li>UE_A automatically answer on chat invitation</li> <li>IMS_A within the trust domain of IMS_B</li> <li>IMS_A not configured for topology hiding</li> </ul>								

Interoperability Test Description		
<b>Test Sequence:</b>	<b>Step</b>	
	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 ends the chat session
	5	Verify that User A is informed that 1-to-1 chat session has ended
	6	Verify that User B is informed that 1-to-1 chat session is terminated
<b>Conformance Criteria:</b>	<b>Check</b>	
	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 { IMS_B receives an initial INVITE from IMS_A addressed to UE_A } then { IMS_B 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 (including a orig-voi_parameter indicating operator_identifier of IMS_A and not including a term-voi_parameter and including access-network-charging-info) } }

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
1												User B invites user A to 1-to-1 chat session
2											INVITE	UE_B sends INVITE to IMS_A with the first SDP offer indicating all specific data for MSRP connection set up

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
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 1-to-1 chat session
27											200 OK	UE_A 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
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

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r 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					←							ACK	UE_B acknowledges the receipt of 200 OK for INVITE
40					→							ACK	IMS_A forwards ACK to IBCF_A
41						→						ACK	IBCF_A forwards ACK to IBCF_B
42							→					ACK	IBCF_B forwards ACK to IMS_B
43								→				ACK	IMS_B forwards ACK to AS/IM_B
44									←			ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
45						←						ACK	IMS_B forwards ACK to IBCF_B
46					←							ACK	IBCF_B forwards ACK to IBCF_A
47					←							ACK	IBCF_A forwards ACK to IMS_A
48				←								ACK	IMS_A forwards ACK to AS/IM_A
49				→								ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
50		←										ACK	IMS_A forwards ACK to UE_A
51	←										→		Users perform chatting
52A											←		User B ends the 1-to-1 chat session
53A					←							BYE	UE_B releases the 1-to-1 chat session with BYE
54A					→							BYE	IMS_A forwards BYE to IBCF_A
55A						→						BYE	IBCF_A forwards BYE to IBCF_B
56A							→					BYE	IBCF_B forwards BYE to IMS_B
57A								→				BYE	IMS_B forwards BYE to AS/IM_B
58A									←			BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
59A						←						BYE	IMS_B forwards BYE to IBCF_B
60A					←							BYE	IBCF_B forwards BYE to IBCF_A
61A					←							BYE	IBCF_A forwards BYE to IMS_A
62A				←								BYE	IMS_A forwards BYE to AS/IM_A
63A				→								BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
64A		←										BYE	IMS_A forwards BYE to UE_A
65A	←												User A is informed that 1-to-1 chat session has ended
66A				→								200 OK	UE_A sends 200 OK for BYE
67A				←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
68A				→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
69A					→							200 OK	IMS_A forwards 200 OK response to IBCF_A
70A						→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
71A							→					200 OK	IBCF_B forwards 200 OK response to IMS_B
72A								→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
73A									←			200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
74A						←						200 OK	IMS_B forwards 200 OK response to IBCF_B

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
75A						←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
76A					←							200 OK	IBCF_A forwards 200 OK response to IMS_A
77A										→		200 OK	IMS_A forwards 200 OK response to UE_B
78A											⇒		User B is informed that 1-to-1 chat session has ended

#### 4.5.2.3 Instant Messaging rejection

##### 4.5.2.3.1 Instant Messaging rejection - interworking

Interoperability Test Description		
<b>Identifier:</b>	TD_IMS_CHAT_0005	
<b>Summary:</b>	IMS network supports instant messaging (IM) service and messages exchange between two users in their home network can be performed. User B rejects the chat invitation.	
<b>Configuration:</b>	CF_INT_AS	
<b>SUT</b>	IMS_A and IMS_B	
<b>References</b>	<b>Test Purpose</b>	<b>Specification Reference</b>
	TP_IMS_5108_03	TS 124 229 [1], clause 5.4.3.2 ¶5 (item 4 in 1 <sup>st</sup> numbered list)
	TP_IMS_5107_02	TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 8 <sup>th</sup> numbered list)
<b>Use Case ref.:</b>	UC_RCS_6_I	
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userIM according to table 1</li> <li>IMS_A is configured to contact AS/IM_A</li> <li>UE_B is registered in IMS_B using userIM according to table 1</li> <li>IMS_B is configured to contact AS/IM_B</li> <li>User A and B are subscribed to IM services</li> <li>UE_B supports interaction on chat invitation</li> <li>IMS_A within the trust domain of IMS_B</li> <li>IMS_A not configured for topology hiding</li> </ul>	
<b>Test Sequence:</b>	<b>Step</b>	
	1	User A invites user B to 1-to-1 chat session
	2	Verify that User B is informed of incoming 1-to-1 chat session
	3	Verify that User A is informed that invitation to an 1-to-1 chat session has reached user B
	4	User B rejects the invitation to an 1-to-1 chat session
	5	Verify that User A is informed that 1-to-1 chat session was rejected by user B
	6	Verify that User B is informed that 1-to-1 chat session is terminated

Interoperability Test Description	
Conformance Criteria:	<p><b>Check 1</b></p> <p>TP_IMS_5108_03 in CFW step 10 (INVITE)</p> <p>ensure that {</p> <p>when { IUT receives an initial INVITE from IMS_A}</p> <p>then { IUT sends the initial INVITE to AS_A</p> <p>containing a topmost Route_header</p> <p>indicating the SIP_URI of AS_A and</p> <p>containing a Route_header</p> <p>indicating the S-CSCF SIP_URI of IMS_A and</p> <p>containing a P-Charging-Vector_header</p> <p>including a orig-ioi_parameter</p> <p>indicating operator_identifier of IMS_A and</p> <p>not including a term-ioi_parameter }</p> <p>}</p>
	<p><b>Check 2</b></p> <p>TP_IMS_5107_02 in CFW step 46 (ACK)</p> <p>ensure that {</p> <p>when { UE_A sends ACK to addressed to UE_B}</p> <p>then { IMS_B receives the ACK</p> <p>not containing a Route_header</p> <p>indicating the S-CSCF_SIP_URI of IMS_A and</p> <p>not containing a P-Access-Network-Info_header</p> <p>}</p> <p>}</p>

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 invites user B to 1-to-1 chat session											User A invites user B to 1-to-1 chat session
2											INVITE	UE_A sends INVITE with 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
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	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
20													User B is informed of incoming 1-to-1 chat session
21												180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that invitation to an enhanced messaging 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													User A is informed that invitation to an 1-to-1 chat session has reached user B
31													User B rejects the invitation to an 1-to-1 chat session
32												480 Temporarily Unavailable	UE_B responds to the INVITE with 480 Temporarily Unavailable
33												480 Temporarily Unavailable	IMS_B forwards 480 Temporarily Unavailable response to AS/IM_B
34												480 Temporarily Unavailable	AS/IM_B returns, possibly modified, 480 Temporarily Unavailable response to IMS_B
35												480 Temporarily Unavailable	IMS_B forwards 480 Temporarily Unavailable response to IBCF_B
36												480 Temporarily Unavailable	IBCF_B forwards 480 Temporarily Unavailable response to IBCF_A
37												480 Temporarily Unavailable	IBCF_A forwards 480 Temporarily Unavailable response to IMS_A
38												480 Temporarily Unavailable	IMS_A forwards 480 Temporarily Unavailable response to AS/IM_A
39												480 Temporarily Unavailable	AS/IM_A returns, possibly modified, 480 Temporarily Unavailable response to IMS_A
40												480 Temporarily Unavailable	IMS_A forwards 480 Temporarily Unavailable response to UE_A
41													User A is informed that 1-to-1 chat session was rejected by user B
42												ACK	UE_A acknowledges the receipt of 480 Temporarily Unavailable response for INVITE
43												ACK	IMS_A forwards ACK to AS/IM_A



Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
44			→								ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
45				→							ACK	IMS_A forwards ACK to IBCF_A
46					→						ACK	IBCF_A forwards ACK to IBCF_B
47						→					ACK	IBCF_B forwards ACK to IMS_B
48							→				ACK	IMS_B forwards ACK to AS/IM_B
49								←			ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
50									→		ACK	IMS_B forwards ACK to UE_B
51										→		User B is informed that 1-to-1 chat session is terminated

#### 4.5.2.3.2 Instant Messaging rejection - roaming

Interoperability Test Description															
<b>Identifier:</b>	TD_IMS_CHAT_0006														
<b>Summary:</b>	IMS network supports instant messaging (IM) service and messages exchange between two users, one user in its home network and one user roaming can be performed. User B rejects the chat invitation.														
<b>Configuration:</b>	CF_ROAM_AS														
<b>SUT</b>	IMS_A and IMS_B														
<b>References</b>	<table border="1"> <thead> <tr> <th>Test Purpose</th> <th>Specification Reference</th> </tr> </thead> <tbody> <tr> <td>TP_IMS_5097_09</td> <td>TS 124 229 [1], clause 5.4.3.2 ¶11 (items 5 and 8 in 1<sup>st</sup> numbered list)</td> </tr> </tbody> </table>	Test Purpose	Specification Reference	TP_IMS_5097_09	TS 124 229 [1], clause 5.4.3.2 ¶11 (items 5 and 8 in 1 <sup>st</sup> numbered list)										
Test Purpose	Specification Reference														
TP_IMS_5097_09	TS 124 229 [1], clause 5.4.3.2 ¶11 (items 5 and 8 in 1 <sup>st</sup> numbered list)														
<b>Use Case ref.:</b>	UC_RCS_6_R														
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userIM according to table 1</li> <li>IMS_A is configured to contact AS/IM_A</li> <li>UE_B is registered in IMS_B via IMS_A using userIM according to table 1</li> <li>IMS_B is configured to contact AS/IM_B</li> <li>User A and B are subscribed to IM services</li> <li>UE_A supports interaction on chat invitation</li> <li>IMS_A within the trust domain of IMS_B</li> <li>IMS_A not configured for topology hiding</li> </ul>														
<b>Test Sequence:</b>	<table border="1"> <thead> <tr> <th>Step</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>User B invites user A to 1-to-1 chat session</td> </tr> <tr> <td>2</td> <td>Verify that User A is informed of incoming 1-to-1 chat session</td> </tr> <tr> <td>3</td> <td>Verify that User B is informed that invitation to an 1-to-1 chat session has reached user A</td> </tr> <tr> <td>4</td> <td>User A rejects the invitation to an 1-to-1 chat session</td> </tr> <tr> <td>5</td> <td>Verify that User B is informed that 1-to-1 chat session was rejected by user A</td> </tr> <tr> <td>6</td> <td>Verify that User A is informed that 1-to-1 chat session is terminated</td> </tr> </tbody> </table>	Step		1	User B invites user A to 1-to-1 chat session	2	Verify that User A is informed of incoming 1-to-1 chat session	3	Verify that User B is informed that invitation to an 1-to-1 chat session has reached user A	4	User A rejects the invitation to an 1-to-1 chat session	5	Verify that User B is informed that 1-to-1 chat session was rejected by user A	6	Verify that User A is informed that 1-to-1 chat session is terminated
Step															
1	User B invites user A to 1-to-1 chat session														
2	Verify that User A is informed of incoming 1-to-1 chat session														
3	Verify that User B is informed that invitation to an 1-to-1 chat session has reached user A														
4	User A rejects the invitation to an 1-to-1 chat session														
5	Verify that User B is informed that 1-to-1 chat session was rejected by user A														
6	Verify that User A is informed that 1-to-1 chat session is terminated														

Interoperability Test Description		
Conformance Criteria:	Check	
	1	TP_IMS_5097_09 in CFW step 10 (INVITE) ensure that { when { IMS_B receives an initial INVITE from IMS_A addressed to UE_A } then { IMS_B 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 (including a orig-ioi_parameter indicating operator_identifier of IMS_A and not including a term-ioi_parameter and including access-network-charging-info) } }

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
1												User B invites user A to 1-to-1 chat session
2											INVITE	UE_B sends INVITE to IMS_A with 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
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

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
26	←											User A is informed of incoming 1-to-1 chat session
27			→								180 Ringing	UE_A responds to initial INVITE with 180 Ringing to indicate that invitation to an enhanced messaging 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										→		User B is informed that invitation to an 1-to-1 chat session has reached user A
40	→											User A rejects the invitation to an 1-to-1 chat session
41			→								480 Temporarily Unavailable	UE_A responds to the INVITE with 480 Temporarily Unavailable
42			←								480 Temporarily Unavailable	IMS_A forwards 480 Temporarily Unavailable response to AS/IM_A
43			→								480 Temporarily Unavailable	AS/IM_A returns, possibly modified, 480 Temporarily Unavailable response to IMS_A
44				→							480 Temporarily Unavailable	IMS_A forwards 480 Temporarily Unavailable response to IBCF_A
45					→						480 Temporarily Unavailable	IBCF_A forwards 480 Temporarily Unavailable response to IBCF_B
46						→					480 Temporarily Unavailable	IBCF_B forwards 480 Temporarily Unavailable response to IMS_B
47							→				480 Temporarily Unavailable	IMS_B forwards 480 Temporarily Unavailable response to AS/IM_B
48								←			480 Temporarily Unavailable	AS/IM_B returns, possibly modified, 480 Temporarily Unavailable response to IMS_B
49								←			480 Temporarily Unavailable	IMS_B forwards 480 Temporarily Unavailable response to IBCF_B

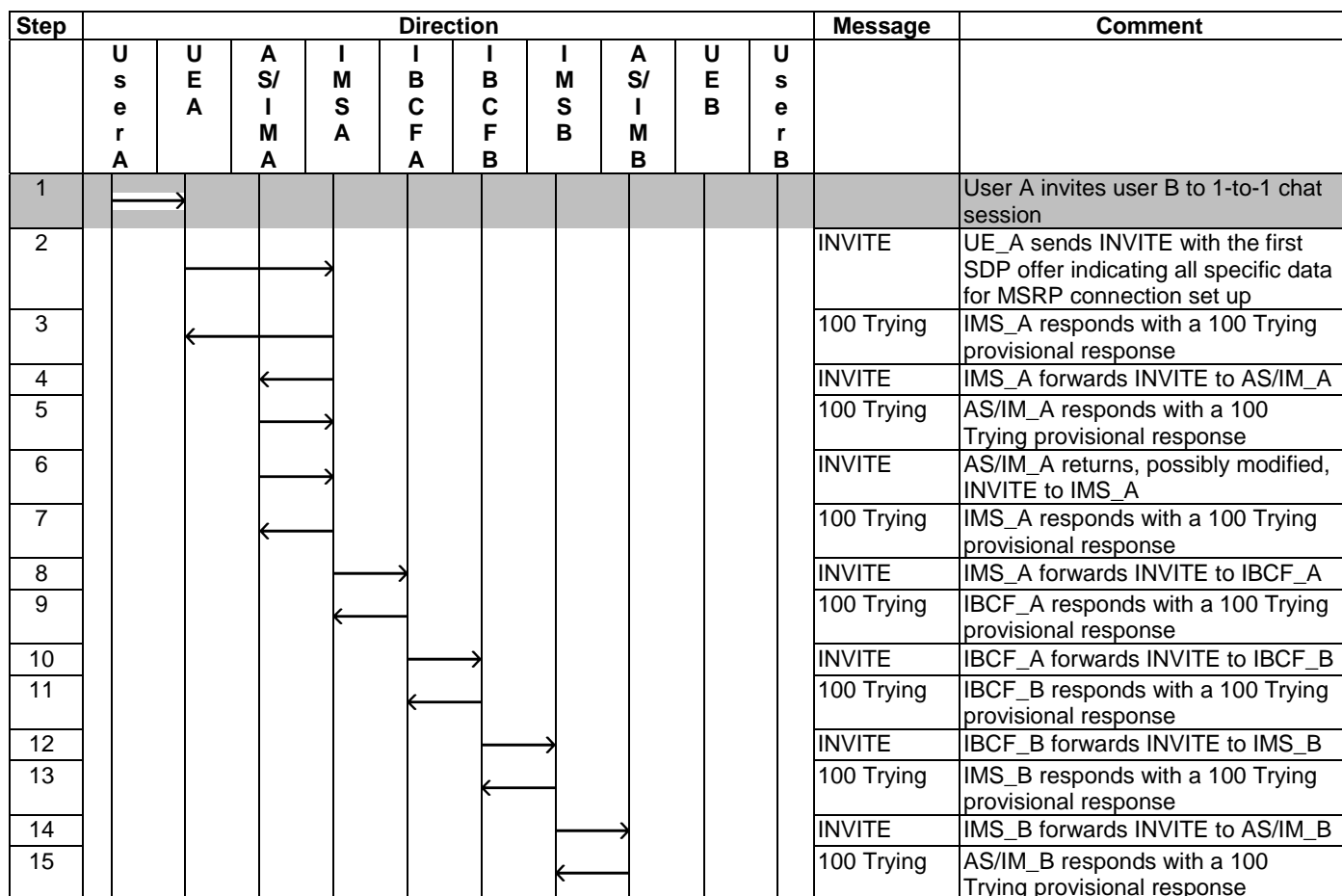
Step	Direction											Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
50												480 Temporarily Unavailable	IBCF_B forwards 480 Temporarily Unavailable response to IBCF_A
51												480 Temporarily Unavailable	IBCF_A forwards 480 Temporarily Unavailable response to IMS_A
52												480 Temporarily Unavailable	IMS_A forwards 480 Temporarily Unavailable response to UE_B
53													User B is informed that 1-to-1 chat session was rejected by user A
54												ACK	UE_B acknowledges the receipt of 480 Temporarily Unavailable response for INVITE
55												ACK	IMS_A forwards ACK to IBCF_A
56												ACK	IBCF_A forwards ACK to IBCF_B
57												ACK	IBCF_B forwards ACK to IMS_B
58												ACK	IMS_B forwards ACK to AS/IM_B
59												ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
60												ACK	IMS_B forwards ACK to IBCF_B
61												ACK	IBCF_B forwards ACK to IBCF_A
62												ACK	IBCF_A forwards ACK to IMS_A
63												ACK	IMS_A forwards ACK to AS/IM_A
64												ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
65												ACK	IMS_A forwards ACK to UE_A
66													User A is informed that 1-to-1 chat session is terminated

#### 4.5.2.4 Instant Messaging no response

##### 4.5.2.4.1 Instant Messaging no response - interworking

Interoperability Test Description					
<b>Identifier:</b>	TD_IMS_CHAT_0007				
<b>Summary:</b>	IMS network supports instant messaging (IM) service and messages exchange between two users in their home network can be performed. User B does not respond to the chat invitation.				
<b>Configuration:</b>	CF_INT_AS				
<b>SUT</b>	IMS_A and IMS_B				
<b>References</b>	<table border="1"> <thead> <tr> <th>Test Purpose</th> <th>Specification Reference</th> </tr> </thead> <tbody> <tr> <td>TP_IMS_5107_03</td> <td>TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 8<sup>th</sup> numbered list)</td> </tr> </tbody> </table>	Test Purpose	Specification Reference	TP_IMS_5107_03	TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 8 <sup>th</sup> numbered list)
Test Purpose	Specification Reference				
TP_IMS_5107_03	TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 8 <sup>th</sup> numbered list)				
<b>Use Case ref.:</b>	UC_RCS_7_I				

Interoperability Test Description																	
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userIM according to table 1</li> <li>IMS_A is configured to contact AS/IM_A</li> <li>UE_B is registered in IMS_B using userIM according to table 1</li> <li>IMS_B is configured to contact AS/IM_B</li> <li>User A and B are subscribed to IM services</li> <li>UE_B supports interaction on chat invitation</li> <li>IMS_A within the trust domain of IMS_B</li> <li>IMS_A not configured for topology hiding</li> </ul>																
<b>Test Sequence:</b>	<table border="1"> <thead> <tr> <th>Step</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>User A invites user B to 1-to-1 chat session</td> </tr> <tr> <td>2</td> <td>Verify that User B is informed of incoming 1-to-1 chat session</td> </tr> <tr> <td>3</td> <td>Verify that User A is informed that invitation to an 1-to-1 chat session has reached user B</td> </tr> <tr> <td>4</td> <td>There is no answer from User B for a certain period of time</td> </tr> <tr> <td>5</td> <td>Verify that User A is informed that there is no answer from User B</td> </tr> <tr> <td>6</td> <td>Verify that User B is informed that 1-to-1 chat session has been cancelled</td> </tr> <tr> <td>7</td> <td>Verify that User A is informed that 1-to-1 chat session is terminated</td> </tr> </tbody> </table>	Step		1	User A invites user B to 1-to-1 chat session	2	Verify that User B is informed of incoming 1-to-1 chat session	3	Verify that User A is informed that invitation to an 1-to-1 chat session has reached user B	4	There is no answer from User B for a certain period of time	5	Verify that User A is informed that there is no answer from User B	6	Verify that User B is informed that 1-to-1 chat session has been cancelled	7	Verify that User A is informed that 1-to-1 chat session is terminated
Step																	
1	User A invites user B to 1-to-1 chat session																
2	Verify that User B is informed of incoming 1-to-1 chat session																
3	Verify that User A is informed that invitation to an 1-to-1 chat session has reached user B																
4	There is no answer from User B for a certain period of time																
5	Verify that User A is informed that there is no answer from User B																
6	Verify that User B is informed that 1-to-1 chat session has been cancelled																
7	Verify that User A is informed that 1-to-1 chat session is terminated																
<b>Conformance Criteria:</b>	<table border="1"> <thead> <tr> <th>Check</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>TP_IMS_5107_03 in CFW step 41 (CANCEL): ensure that {   when { UE_A sends CANCEL to UE_B }   then { IMS_B receives the CANCEL           not containing Route_header           indicating the S-CSCF_SIP_URI of IMS_A   } }</td> </tr> </tbody> </table>	Check		1	TP_IMS_5107_03 in CFW step 41 (CANCEL): ensure that { when { UE_A sends CANCEL to UE_B } then { IMS_B receives the CANCEL not containing Route_header indicating the S-CSCF_SIP_URI of IMS_A } }												
Check																	
1	TP_IMS_5107_03 in CFW step 41 (CANCEL): ensure that { when { UE_A sends CANCEL to UE_B } then { IMS_B receives the CANCEL not containing Route_header indicating the S-CSCF_SIP_URI of IMS_A } }																



Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
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 1-to-1 chat session
21											←	180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that invitation to an enhanced messaging 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											←		User A is informed that invitation to an 1-to-1 chat session has reached user B
31													There is no answer from user B for a certain period of time
32											←		User A is informed that there is no answer from user B
33											→	CANCEL	UE_A sends CANCEL to IMS_A
34											←	200 OK	IMS_A responds with a 200 OK to UE_A
35											←	CANCEL	IMS_A forwards the CANCEL to AS/IM_A
36											→	200 OK	AS/IM_A responds with a 200 OK to IMS_A
37											→	CANCEL	AS/IM_A returns, possibly modified, CANCEL to IMS_A
38											←	200 OK	IMS_A responds with a 200 OK to AS/IM_A
39											→	CANCEL	IMS_A forwards CANCEL to IBCF_A
40											←	200 OK	IBCF_A responds with a 200 OK to IMS_A
41											→	CANCEL	IBCF_A forwards CANCEL to IBCF_B
42											←	200 OK	IBCF_B responds with a 200 OK to IBCF_A
43											→	CANCEL	IBCF_B forwards CANCEL to IMS_B
44											←	200 OK	IMS_B responds with a 200 OK to IBCF_B

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
45												CANCEL	IMS_B forwards CANCEL to AS/IM_B
46												200 OK	AS/IM_B responds with a 200 OK to IMS_B
47												CANCEL	AS/IM_B returns, possibly modified, CANCEL to IMS_B
48												200 OK	IMS_B responds with a 200 OK to AS/IM_B
49												CANCEL	IMS_B forwards CANCE to UE_B
50												200 OK	UE_B responds with a 200 OK to IMS_B
51													User B is informed that 1-to-1 chat session has been cancelled
52												487 Request Terminated	UE_B responds to the INVITE with 487 Request Terminated
53												ACK	IMS_B responds with ACK to UE_B
54												487 Request Terminated	IMS_B forwards 487 Request Terminated response to AS/IM_B
55												ACK	IMS_B responds with ACK to AS/IM_B
56												487 Request Terminated	AS/IM_B returns, possibly modified, 487 Request Terminated response to IMS_B
57												ACK	AS/IM_B responds with ACK to IMS_B
58												487 Request Terminated	IMS_B forwards 487 Request Terminated response to IBCF_B
59												ACK	IMS_B responds with ACK to IBCF_B
60												487 Request Terminated	IBCF_B forwards 487 Request Terminated response to IBCF_A
61												ACK	IBCF_B responds with ACK to IBCF_A
62												487 Request Terminated	IBCF_A forwards 487 Request Terminated response to IMS_A
63												ACK	IBCF_A responds with ACK to IMS_A
64												487 Request Terminated	IMS_A forwards 487 Request Terminated response to AS/IM_A
65												ACK	IMS_A responds with ACK to AS/IM_A
66												487 Request Terminated	AS/IM_A returns, possibly modified, 487 Request Terminated response to IMS_A
67												ACK	AS/IM_A responds with ACK to IMS_A
68												487 Request Terminated	IMS_A forwards 487 Request Terminated response to UE_A
69												ACK	IMS_A responds with ACK to UE_A
70													User A is informed that 1-to-1 chat session is terminated

4.5.2.4.2 Instant Messaging no response - roaming

Interoperability Test Description		
<b>Identifier:</b>	TD_IMS_CHAT_0008	
<b>Summary:</b>	IMS network supports instant messaging (IM) service and messages exchange between two users, one user in its home network and one user roaming can be performed. User B does not respond to the chat invitation.	
<b>Configuration:</b>	CF_ROAM_AS	
<b>SUT</b>	IMS_A and IMS_B	
<b>References</b>	<b>Test Purpose</b>	<b>Specification Reference</b>
	TP_IMS_5107_03	TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 8 <sup>th</sup> numbered list)
<b>Use Case ref.:</b>	UC_RCS_7_R	
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>• HSS of IMS_A and of IMS B is configured according to table 1</li> <li>• UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>• UE_A is registered in IMS_A using userIM according to table 1</li> <li>• IMS_A is configured to contact AS/IM_A</li> <li>• UE_B is registered in IMS_B via IMS_A using userIM according to table 1</li> <li>• IMS_B is configured to contact AS/IM_B</li> <li>• User A and B are subscribed to IM services</li> <li>• UE_A supports interaction on chat invitation</li> <li>• IMS_A within the trust domain of IMS_B</li> <li>• IMS_A not configured for topology hiding</li> </ul>	
<b>Test Sequence:</b>	<b>Step</b>	
	1	User B invites user A to 1-to-1 chat session
	2	Verify that User A is informed of incoming 1-to-1 chat session
	3	Verify that User B is informed that invitation to an 1-to-1 chat session has reached user A
	4	There is no answer from User A for a certain period of time
	5	Verify that User B is informed that there is no answer from User B
	6	Verify that User A is informed that 1-to-1 chat session has been cancelled
	7	Verify that User B is informed that 1-to-1 chat session is terminated
<b>Conformance Criteria:</b>	<b>Check</b>	
	1	TP_IMS_5107_03 in CFW step 56 (CANCEL): ensure that { when { UE_A sends CANCEL to UE_B } then { IMS_B receives the CANCEL not containing Route_header indicating the S-CSCF_SIP_URI of IMS_A } }

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
1											←	User B invites user A to 1-to-1 chat session
2				←							INVITE	UE_B sends INVITE to IMS_A with 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



Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r 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 1-to-1 chat session
27			→								180 Ringing	UE_A responds to initial INVITE with 180 Ringing to indicate that invitation to an enhanced messaging 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

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
39												User B is informed that invitation to an 1-to-1 chat session has reached user A
40												There is no answer from user A for a certain period of time
41												User B is informed that there is no answer from user A
42												CANCEL UE_B sends CANCEL to IMS_A
43												200 OK IMS_A responds with a 200 OK to UE_B
44												CANCEL IMS_A forwards CANCEL to IBCF_A
45												200 OK IBCF_A responds with a 200 OK to IMS_A
46												CANCEL IBCF_A forwards CANCEL to IBCF_B
47												200 OK IBCF_B responds with a 200 OK to IBCF_A
48												CANCEL IBCF_B forwards CANCEL to IMS_B
49												200 OK IMS_B responds with a 200 OK to IBCF_B
50												CANCEL IMS_B forwards CANCEL to AS/IM_B
51												200 OK AS/IM_B responds with a 200 OK to IMS_B
52												CANCEL AS/IM_B returns, possibly modified, CANCEL to IMS_B
53												200 OK IMS_B responds with a 200 OK to AS/IM_B
54												CANCEL IMS_B forwards CANCEL to IBCF_B
55												200 OK IBCF_B responds with a 200 OK to IMS_B
56												CANCEL IBCF_B forwards CANCEL to IBCF_A
57												200 OK IBCF_A responds with a 200 OK to IBCF_B
58												CANCEL IBCF_A forwards CANCEL to IMS_A
59												200 OK IMS_A responds with a 200 OK to IBCF_A
60												CANCEL IMS_A forwards CANCEL to AS/IM_A
61												200 OK AS/IM_A responds with a 200 OK to IMS_A
62												CANCEL AS/IM_A returns, possibly modified, CANCEL to IMS_A
63												200 OK IMS_A responds with a 200 OK to AS/IM_A
64												CANCEL IMS_A forwards CANCEL to UE_A
65												200 OK UE_A responds with a 200 OK to IMS_A
66												User A is informed that 1-to-1 chat session has been cancelled
67												487 Request Terminated UE_A responds to the INVITE with 487 Request Terminated
68												ACK IMS_A responds with ACK to UE_A
69												487 Request Terminated IMS_A forwards 487 Request Terminated response to AS/IM_A
70												ACK AS/IM_A responds with ACK 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			
71												487 Request Terminated	AS/IM_A returns, possibly modified, 487 Request Terminated response to IMS_A
72												ACK	IMS_A responds with ACK to AS/IM_A
73												487 Request Terminated	IMS_A forwards 487 Request Terminated response to IBCF_A
74												ACK	IBCF_A responds with ACK to IMS_A
75												487 Request Terminated	IBCF_A forwards 487 Request Terminated response to IBCF_B
76												ACK	IBCF_B responds with ACK to IBCF_A
77												487 Request Terminated	IBCF_B forwards 487 Request Terminated response to IMS_B
78												ACK	IMS_B responds with ACK to IBCF_B
79												487 Request Terminated	IMS_B forwards 487 Request Terminated response to AS/IM_B
80												ACK	AS/IM_B responds with ACK to IMS_B
81												487 Request Terminated	AS/IM_B returns, possibly modified, 487 Request Terminated response to IMS_B
82												ACK	IMS_B responds with ACK to AS/IM_B
83												487 Request Terminated	IMS_B forwards 180 Ringing response to IBCF_B
84												ACK	IBCF_B responds with ACK to IMS_B
85												487 Request Terminated	IBCF_B forwards 487 Request Terminated response to IBCF_A
86												ACK	IBCF_A responds with ACK to IBCF_B
87												487 Request Terminated	IBCF_A forwards 487 Request Terminated response to IMS_A
88												ACK	IMS_A responds with ACK to IBCF_A
89												487 Request Terminated	IMS_A forwards 487 Request Terminated response to UE_B
90												ACK	UE_B responds with ACK to IMS_A
91													User B is informed that 1-to-1 chat session is terminated

### 4.5.3 Group chat (1 to many)

#### 4.5.3.1 Ad-hoc IM Conference

##### 4.5.3.1.1 Ad-hoc IM Conference - interworking

Interoperability Test Description		
<b>Identifier:</b>	TD_IMS_CHAT_0009	
<b>Summary:</b>	IMS network handles subsequent INVITEs and NOTIFYs correctly during establishment of an Ad-hoc IM Conferences between users in their home networks	
<b>Configuration:</b>	CF_INT_AS	
<b>SUT</b>	IMS_A and IMS_B	
<b>References</b>	<b>Test Purpose</b>	<b>Specification Reference</b>
	TP_IMS_5097_01	TS 124 229 [1], clause 5.4.3.2 ¶11 (1 <sup>st</sup> numbered list)
	TP_IMS_5108_03	TS 124 229 [1], clause 5.4.3.3 ¶5 (item 4 in 1 <sup>st</sup> numbered list)
	TP_IMS_5115_08	TS 124 229 [1], clause 5.4.3.3 ¶89 (4 <sup>th</sup> numbered list)
<b>Use Case ref.:</b>	UC_RCS_8_I	
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>• HSS of IMS_A and of IMS B is configured according to table 1</li> <li>• UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>• UE_A is registered in IMS_A using userIM according to table 1</li> <li>• IMS_A is configured to contact AS/IM_A</li> <li>• UE_B is registered in IMS_B using userIM according to table 1</li> <li>• IMS_B is configured to contact AS/IM_B</li> <li>• User A and B are subscribed to IM services</li> <li>• UE_B automatically answer on chat invitation</li> <li>• IMS_A within the trust domain of IMS_B</li> <li>• User A is pre-provisioned with conference-factory URI in IMS A</li> <li>• AS/IM_A server assumes to be a Controlling IM server for Ad-hoc IM Conference sessions</li> <li>• IMS_A not configured for topology hiding</li> </ul>	
<b>Test Sequence:</b>	<b>Step</b>	
	1	User A initiates an Ad-hoc IM conference with user B
	2	Verify that User A is informed that the Ad Hoc IM Conference is established
	3	Verify that User B is informed of incoming invitation from User A to join the Ad-hoc IM Conference
	4	User B joins the Ad-hoc IM Conference (automatically)
	5	Verify that User A is notified that User B has joined the Ad-hoc IM Conference
	6	Verify that users perform enhanced messaging in the Ad-hoc IM Conference
	7	User B leaves the Ad-hoc IM Conference
	8	Verify that User B is informed that the Ad-hoc IM Conference has ended
	9	Verify that User A is notified that user B has left the Ad-hoc IM Conference
	10	User A leaves the Ad-hoc IM Conference
11	Verify that User A is informed that the Ad-hoc IM Conference has ended	

Interoperability Test Description		
Conformance Criteria:	Check	
	1	TP_IMS_5097_01 in CFW step 15 (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 containing a Record-Route_header indicating the originating S-CSCF_SIP_URI } }
	2	TP_IMS_5108_03 in CFW step 19 (INVITE) ensure that { when { IMS_B receives an initial INVITE from IMS_A addressed_to UE_B } then { IMS_B sends the initial 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 IMS_B and containing a P-Charging-Vector_header including a orig-ioi_parameter indicating operator_identifier of IMS_A and not including a term-ioi_parameter } }
	3	TP_IMS_5115_08 in CFW step 31 (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_BIUT_ } }

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
1	→											User A initiates an Ad-hoc IM conference with user B
2		→									INVITE	UE_A sends INVITE to IMS_A with a 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 Ad-hoc IM Conference to indicate that the session has been accepted and SDP to inform A-side with specific data for MSRP connection set up

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
7			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
8	←											User A is informed that the Ad Hoc IM Conference 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 AD-hoc IM Conference) 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 Ad-hoc IM Conference
26									←			User B joins the Ad-hoc IM Conference (automatically)
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

Step	Direction										Message	Comment		
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r 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													NOTIFY	AS/IM_A sends NOTIFY to UE_A to inform it that User B has successfully joined the Ad-hoc IM Conference
42											←	NOTIFY	IMS_A forwards the NOTIFY to UE_A	
43											←		User A is notified that User B has joined the Ad-hoc IM Conference	
44											→	200 OK	UE_A responds with 200 OK to IMS_A	
45											←	200 OK	IMS_A forwards the 200 OK response to AS/IM_A	
46											↔		Users perform enhanced messaging in the Ad-hoc IM Conference	
47A											←		User B leaves the Ad-hoc IM Conference	
48A											←	BYE	UE_B sends BYE to IMS_B to leave the Ad-hoc IM Conference	
49A											→	BYE	IMS_B forwards BYE to AS/IM_B	
50A											←	BYE	AS/IM_B returns, possibly modified, BYE to IMS_B	
51A											←	BYE	IMS_B forwards BYE to IBCF_B	
52A											←	BYE	IBCF_B forwards BYE to IBCF_A	
53A											←	BYE	IBCF_A forwards BYE to IMS_A	
54A											←	BYE	IMS_A forwards BYE to AS/IM_A	
55A											→	200 OK	AS/IM_A sends 200 OK for BYE	
56A											→	200 OK	IMS_A forwards 200 OK response to IBCF_A	
57A											→	200 OK	IBCF_A forwards 200 OK response to IBCF_B	
58A											→	200 OK	IBCF_B forwards 200 OK response to IMS_B	
59A											→	200 OK	IMS_B forwards 200 OK response to AS/IM_B	
60A											←	200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B	
61A											→	200 OK	IMS_B forwards 200 OK response to UE_B	
62A											↔		User B is informed that the Ad-hoc IM Conference has ended	
63A											→	NOTIFY	AS/IM_A sends NOTIFY to IMS_A to inform UE_A that User B has left the Ad-hoc IM Conference	
64A											←	NOTIFY	IMS_A forwards the NOTIFY to UE_A	
65A											←		User A is notified that user B has left the Ad-hoc IM Conference	
66A											→	200 OK	UE_A responds with 200 OK to IMS_A	
67A											←	200 OK	IMS_A forwards the 200 OK response to AS/IM_A	
68A											↔		User A leaves the Ad-hoc IM Conference	
69A											→	BYE	UE_A sends BYE to IMS_A to leave the Ad-hoc IM Conference	

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
70A			←								BYE	IMS_A forwards BYE to AS/IM_A
71A			→								200 OK	AS/IM_A sends 200 OK for BYE
72A			←								200 OK	IMS_A forwards 200 OK response to UE_A
73A	←											User A is informed that the Ad-hoc IM Conference has ended

## 4.5.3.1.2 Ad-hoc IM Conference - roaming

Interoperability Test Description																									
<b>Identifier:</b>	TD_IMS_CHAT_0010																								
<b>Summary:</b>	IMS network handles subsequent INVITEs and NOTIFYs correctly during establishment of an Ad-hoc IM Conferences between users, one user in its home network and the other user roaming																								
<b>Configuration:</b>	CF_ROAM_AS																								
<b>SUT</b>	IMS_A and IMS_B																								
<b>References</b>	<table border="1"> <thead> <tr> <th>Test Purpose</th> <th>Specification Reference</th> </tr> </thead> <tbody> <tr> <td>TP_IMS_5046_01</td> <td>TS 124 229 [1], clause 5.2.6.3.3 ¶1 (1<sup>st</sup> numbered list)</td> </tr> <tr> <td>TP_IMS_5110_01</td> <td>TS 124 229 [1], clause 5.4.3.3 ¶79 (after 6<sup>th</sup> dashed list)</td> </tr> </tbody> </table>	Test Purpose	Specification Reference	TP_IMS_5046_01	TS 124 229 [1], clause 5.2.6.3.3 ¶1 (1 <sup>st</sup> numbered list)	TP_IMS_5110_01	TS 124 229 [1], clause 5.4.3.3 ¶79 (after 6 <sup>th</sup> dashed list)																		
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<b>Use Case ref.:</b>	UC_RCS_8_R																								
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userIM according to table 1</li> <li>IMS_A is configured to contact AS/IM_A</li> <li>UE_B is registered in IMS_B via IMS_A using userIM according to table 1</li> <li>IMS_B is configured to contact AS/IM_B</li> <li>User A and B are subscribed to IM services</li> <li>UE_A automatically answer on chat invitation</li> <li>IMS_A within the trust domain of IMS_B</li> <li>User B is pre-provisioned with conference-factory URI in IMS B</li> <li>AS/IM_B server assumes to be a Controlling IM server for Ad-hoc IM Conference sessions</li> <li>IMS_A not configured for topology hiding</li> </ul>																								
<b>Test Sequence:</b>	<table border="1"> <thead> <tr> <th>Step</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>User B initiates an Ad-hoc IM conference with user A</td> </tr> <tr> <td>2</td> <td>Verify that User B is informed that the Ad Hoc IM Conference is established</td> </tr> <tr> <td>3</td> <td>Verify that User A is informed of incoming invitation from User B to join the Ad-hoc IM Conference</td> </tr> <tr> <td>4</td> <td>User A joins the Ad-hoc IM Conference (automatically)</td> </tr> <tr> <td>5</td> <td>Verify that User B is notified that User A has joined the Ad-hoc IM Conference</td> </tr> <tr> <td>6</td> <td>Verify that users perform enhanced messaging in the Ad-hoc IM Conference</td> </tr> <tr> <td>7</td> <td>User A leaves the Ad-hoc IM Conference</td> </tr> <tr> <td>8</td> <td>Verify that User A is informed that the Ad-hoc IM Conference has ended</td> </tr> <tr> <td>9</td> <td>Verify that User B is notified that user A has left the Ad-hoc IM Conference</td> </tr> <tr> <td>10</td> <td>User B leaves the Ad-hoc IM Conference</td> </tr> <tr> <td>11</td> <td>Verify that User B is informed that the Ad-hoc IM Conference has ended</td> </tr> </tbody> </table>	Step		1	User B initiates an Ad-hoc IM conference with user A	2	Verify that User B is informed that the Ad Hoc IM Conference is established	3	Verify that User A is informed of incoming invitation from User B to join the Ad-hoc IM Conference	4	User A joins the Ad-hoc IM Conference (automatically)	5	Verify that User B is notified that User A has joined the Ad-hoc IM Conference	6	Verify that users perform enhanced messaging in the Ad-hoc IM Conference	7	User A leaves the Ad-hoc IM Conference	8	Verify that User A is informed that the Ad-hoc IM Conference has ended	9	Verify that User B is notified that user A has left the Ad-hoc IM Conference	10	User B leaves the Ad-hoc IM Conference	11	Verify that User B is informed that the Ad-hoc IM Conference has ended
Step																									
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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_5110_01 in CFW step 43 (200 OK) ensure that { when { IMS_A receives a 200_response from AS_A addressed_to UE_B } then { IMS_A sends the 200_response to IMS_B } }

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
1												User B initiates an Ad-hoc IM conference with user A
2											INVITE	UE_B sends INVITE to IMS_A with a 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 Ad-hoc IM Conference to indicate that the session has been accepted and SDP to inform A-side with specific data for MSRP connection set up

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
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 Ad Hoc IM Conference 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 AD-hoc IM Conference) 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 Ad-hoc IM Conference
38											⇒		User A joins the Ad-hoc IM Conference (automatically)
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

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r 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											NOTIFY	AS/IM_B sends NOTIFY to UE_B to inform it that User A has successfully joined the Ad-hoc IM Conference
54											NOTIFY	IMS_B forwards NOTIFY to IBCF_B
55											NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
56											NOTIFY	IBCF_A forwards NOTIFY to IMS_A
57											NOTIFY	IMS_A forwards NOTIFY to UE_B
58												User B is notified that User A has joined the Ad-hoc IM Conference
59											200 OK	UE_B responds with 200 OK to IMS_A
60											200 OK	IMS_A forwards 200 OK response to IBCF_A
61											200 OK	IBCF_A forwards 200 OK response to IBCF_B
62											200 OK	IBCF_B forwards 200 OK response to IMS_B
63											200 OK	IMS_B forwards 200 OK response to AS/IM_B
64												Users perform enhanced messaging in the Ad-hoc IM Conference
65A												User A leaves the Ad-hoc IM Conference
66A											BYE	UE_A sends BYE to IMS_A to leave the Ad-hoc IM Conference
67A											BYE	IMS_A forwards BYE to AS/IM_A
68A											BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
69A											BYE	IMS_A forwards BYE to IBCF_A
70A											BYE	IBCF_A forwards BYE to IBCF_B
71A											BYE	IBCF_B forwards BYE to IMS_B
72A											BYE	IMS_B forwards BYE to AS/IM_B
73A											200 OK	AS/IM_B sends 200 OK for BYE
74A											200 OK	IMS_B forwards 200 OK response to IBCF_B
75A											200 OK	IBCF_B forwards 200 OK response to IBCF_A
76A											200 OK	IBCF_A forwards 200 OK response to IMS_A
77A											200 OK	IMS_A forwards 200 OK response to AS/IM_A
78A											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
79A											200 OK	IMS_A forwards 200 OK response to UE_A

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
80A	←											User A is informed that the Ad-hoc IM Conference has ended
81A											NOTIFY	AS/IM_B sends NOTIFY to IMS_B to inform UE_B that User A has left the Ad-hoc IM Conference
82A											NOTIFY	IMS_B forwards NOTIFY to IBCF_B
83A											NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
84A											NOTIFY	IBCF_A forwards NOTIFY to IMS_A
85A											NOTIFY	IMS_A forwards NOTIFY to UE_B
86A												User B is notified that user A has left the Ad-hoc IM Conference
87A											200 OK	UE_B responds with 200 OK to IMS_A
88A											200 OK	IMS_A forwards 200 OK response to IBCF_A
89A											200 OK	IBCF_A forwards 200 OK response to IBCF_B
90A											200 OK	IBCF_B forwards 200 OK response to IMS_B
91A											200 OK	IMS_B forwards 200 OK response to AS/IM_B
92A												User B leaves the Ad-hoc IM Conference
93A											BYE	UE_B sends BYE to IMS_A to leave the Ad-hoc IM Conference
94A											BYE	IMS_A forwards BYE to IBCF_A
95A											BYE	IBCF_A forwards BYE to IBCF_B
96A											BYE	IBCF_B forwards BYE to IMS_B
97A											BYE	IMS_B forwards BYE to AS/IM_B
98A											200 OK	AS/IM_B sends 200 OK for BYE
99A											200 OK	IMS_B forwards 200 OK response to IBCF_B
100A											200 OK	IBCF_B forwards 200 OK response to IBCF_A
101A											200 OK	IBCF_A forwards 200 OK response to IMS_A
102A											200 OK	IMS_A forwards 200 OK response to UE_B
103A												User B is informed that the Ad-hoc IM Conference has ended

#### 4.5.3.2 Extending 1-to-1 IM session to an Ad-hoc IM conference

##### 4.5.3.2.1 Extending 1-to-1 IM session to an Ad-hoc IM conference - interworking

Interoperability Test Description					
<b>Identifier:</b>	TD_IMS_CHAT_0011				
<b>Summary:</b>	IMS network handles subsequent INVITEs and NOTIFYs correctly during extension of 1-to-1 session to an Ad-hoc IM Conferences between users in their home network				
<b>Configuration:</b>	CF_INT_AS				
<b>SUT</b>	IMS_A and IMS_B				
<b>References</b>	<table border="1"> <thead> <tr> <th>Test Purpose</th> <th>Specification Reference</th> </tr> </thead> <tbody> <tr> <td>TP_IMS_5108_03</td> <td>TS 124 229 [1], clause 5.4.3.3 ¶5 (item 4 in 1<sup>st</sup> numbered list)</td> </tr> </tbody> </table>	Test Purpose	Specification Reference	TP_IMS_5108_03	TS 124 229 [1], clause 5.4.3.3 ¶5 (item 4 in 1 <sup>st</sup> numbered list)
Test Purpose	Specification Reference				
TP_IMS_5108_03	TS 124 229 [1], clause 5.4.3.3 ¶5 (item 4 in 1 <sup>st</sup> numbered list)				
<b>Use Case ref.:</b>	UC_RCS_9_I				

<b>Interoperability Test Description</b>		
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>• HSS of IMS_A and of IMS B is configured according to table 1</li> <li>• UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>• UE_A is registered in IMS_A using userIM according to table 1</li> <li>• IMS_A is configured to contact AS/IM_A</li> <li>• UE_B is registered in IMS_B using userIM according to table 1</li> <li>• IMS_B is configured to contact AS/IM_B</li> <li>• User A and B are subscribed to IM services</li> <li>• UE_B automatically answer on chat invitation</li> <li>• IMS_A within the trust domain of IMS_B</li> <li>• User A is pre-provisioned with conference-factory URI in IMS A</li> <li>• AS/IM_A server assumes to be a Controlling IM server for Ad-hoc IM Conference sessions</li> <li>• IMS_A not configured for topology hiding</li> </ul>	
<b>Test Sequence:</b>	<b>Step</b>	
	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 enhanced messaging 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
<b>Conformance Criteria:</b>	<b>Check</b>	
	1	TP_IMS_5108_03 in CFW step 58 (INVITE) <i>ensure that {</i> <i>  when { IMS_B receives an initial INVITE from IMS_A addressed_to UE_B }</i> <i>  then { IMS_B sends the initial INVITE to AS_B</i> <i>    containing a topmost Route_header</i> <i>      indicating the SIP_URI of AS_B and</i> <i>    containing a Route_header</i> <i>      indicating the S-CSCF_SIP_URI of IMS_B and</i> <i>    containing a P-Charging-Vector_header</i> <i>      including a orig-ioi_parameter</i> <i>      indicating operator_identifier of IMS_A and</i> <i>      not including a term-ioi_parameter }</i> <i>}</i>

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
40	→											Follow UC_RCS_4_I (1-39) User A initiates an Ad-hoc IM conference with user B
41			→									INVITE UE_A sends INVITE to IMS_A with a MIME resource-list body including invited IM Users and the first SDP offer indicating all specific data for MSRP connection set up
42			←									100 Trying IMS_A responds with a 100 Trying provisional response
43			←									INVITE IMS_A forwards INVITE to AS/IM_A
44			→									100 Trying AS/IM_A responds with a 100 Trying provisional response
45			→									200 OK AS/IM_A responds INVITE with 200 OK response with IM session Identity allocated for the current Ad-hoc IM Conference to indicate that the session has been accepted and SDP to inform A-side with specific data for MSRP connection set up
46			←									200 OK IMS_A forwards 200 OK response to AS/IM_A
47	←											User A is informed that the Ad Hoc IM Conference is established
48			→									ACK UE_A acknowledges the receipt of 200 OK for INVITE
49			←									ACK IMS_A forwards ACK to AS/IM_A
50			→									INVITE AS/IM_A sends INVITE to UE_B with IM session identity (allocated for the current AD-hoc IM Conference), IM address of the Inviting IM UE (UE_A) and Replaces header with the original 1-to-1 session identity
51			←									100 Trying IMS_A responds with a 100 Trying provisional response
52			→									INVITE IMS_A forwards INVITE to IBCF_A
53			←									100 Trying IBCF_A responds with a 100 Trying provisional response
54			→									INVITE IBCF_A forwards INVITE to IBCF_B
55			←									100 Trying IBCF_B responds with a 100 Trying provisional response
56			→									INVITE IBCF_B forwards INVITE to IMS_B
57			←									100 Trying IMS_B responds with a 100 Trying provisional response
58			→									INVITE IMS_B forwards INVITE to AS/IM_B
59			←									100 Trying AS/IM_B responds with a 100 Trying provisional response
60			←									INVITE AS/IM_B returns, possibly modified, INVITE to IMS_B
61			→									100 Trying IMS_B responds with a 100 Trying provisional response
62			→									INVITE IMS_B forwards INVITE to UE_B
63			←									100 Trying UE_B optionally responds with a 100 Trying provisional response
64										→		User B is informed of incoming invitation from User A to join the Ad-hoc IM Conference

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
65													User B joins the Ad-hoc IM Conference (automatically)
66												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
67												200 OK	IMS_B forwards 200 OK response to AS/IM_B
68												200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
69												200 OK	IMS_B forwards 200 OK response to IBCF_B
70												200 OK	IBCF_B forwards 200 OK response to IBCF_A
71												200 OK	IBCF_A forwards 200 OK response to IMS_A
72												200 OK	IMS_A forwards 200 OK response to AS/IM_A
73												ACK	AS/IM_A acknowledges the receipt of 200 OK for INVITE
74												ACK	IMS_A forwards ACK to IBCF_A
75												ACK	IBCF_A forwards ACK to IBCF_B
76												ACK	IBCF_B forwards ACK to IMS_B
77												ACK	IMS_B forwards ACK to AS/IM_B
78												ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
79												ACK	IMS_B forwards ACK to UE_B
80												NOTIFY	AS/IM_A sends NOTIFY to UE_A to inform it that User B has successfully joined the Ad-hoc IM Conference
81												NOTIFY	IMS_A forwards the NOTIFY to UE_A
82													User A is notified that User B has joined the Ad-hoc IM Conference
83												200 OK	UE_A responds with 200 OK to IMS_A
84												200 OK	IMS_A forwards the 200 OK response to AS/IM_A
85												BYE	UE_B releases the 1-to-1 IM session with BYE
86												BYE	IMS_B forwards BYE to AS/IM_B
87												BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
88												BYE	IMS_B forwards BYE to IBCF_B
89												BYE	IBCF_B forwards BYE to IBCF_A
90												BYE	IBCF_A forwards BYE to IMS_A
91												BYE	IMS_A forwards BYE to AS/IM_A
92												BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
93												BYE	IMS_A forwards BYE to UE_A
94													User A informed that 1-to-1 IM session with user B has ended
95												200 OK	UE_A sends 200 OK for BYE
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

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
98				→							200 OK	IMS_A forwards 200 OK response to IBCF_A
99					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
100						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
101							→				200 OK	IMS_B forwards 200 OK response to AS/IM_B
102							←				200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
103								→			200 OK	IMS_B forwards 200 OK response to UE_B
104									→			User B informed that 1-to-1 IM session with user A has ended
105										←		Users perform enhanced messaging in the Ad-hoc IM Conference
												Continue UC_RCS_8_I (47A-73A)

#### 4.5.3.2.2 Extending 1-to-1 IM session to an Ad-hoc IM conference - roaming

Interoperability Test Description																			
<b>Identifier:</b>	TD_IMS_CHAT_0012																		
<b>Summary:</b>	IMS network handles subsequent INVITEs and NOTIFYs correctly during extension of 1-to-1 session to an Ad-hoc IM Conferences between users, one user in its home network and the other user roaming																		
<b>Configuration:</b>	CF_ROAM_AS																		
<b>SUT</b>	IMS_A and IMS_B																		
<b>References</b>	<table border="1"> <thead> <tr> <th>Test Purpose</th> <th>Specification Reference</th> </tr> </thead> <tbody> <tr> <td>TP_IMS_5070_01</td> <td>TS 124 229 [1], clause 5.2.7.3 ¶3</td> </tr> </tbody> </table>	Test Purpose	Specification Reference	TP_IMS_5070_01	TS 124 229 [1], clause 5.2.7.3 ¶3														
Test Purpose	Specification Reference																		
TP_IMS_5070_01	TS 124 229 [1], clause 5.2.7.3 ¶3																		
<b>Use Case ref.:</b>	UC_RCS_9_R																		
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userIM according to table 1</li> <li>IMS_A is configured to contact AS/IM_A</li> <li>UE_B is registered in IMS_B using via IMS_A userIM according to table 1</li> <li>IMS_B is configured to contact AS/IM_B</li> <li>User A and B are subscribed to IM services</li> <li>UE_A automatically answer on chat invitation</li> <li>IMS_A within the trust domain of IMS_B</li> <li>User B is pre-provisioned with conference-factory URI in IMS B</li> <li>AS/IM_B server assumes to be a Controlling IM server for Ad-hoc IM Conference sessions</li> <li>IMS_A not configured for topology hiding</li> </ul>																		
<b>Test Sequence:</b>	<table border="1"> <thead> <tr> <th>Step</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>User B invites user A to 1-to-1 chat session</td> </tr> <tr> <td>2</td> <td>User A automatically accepts 1-to-1 chat invitation</td> </tr> <tr> <td>3</td> <td>Verify that Users perform chatting</td> </tr> <tr> <td>4</td> <td>User B initiates an Ad-hoc IM conference with user A</td> </tr> <tr> <td>5</td> <td>Verify that User B is informed that the Ad Hoc IM Conference is established</td> </tr> <tr> <td>6</td> <td>Verify that User A is informed of incoming invitation from User B to join the Ad-hoc IM Conference</td> </tr> <tr> <td>7</td> <td>User A joins the Ad-hoc IM Conference (automatically)</td> </tr> <tr> <td>8</td> <td>Verify that User B is notified that User A has joined the Ad-hoc IM Conference</td> </tr> </tbody> </table>	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
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																		



Interoperability Test Description		
	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 enhanced messaging 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 79 (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
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
												Follow UC_RCS_4_R (1-51)
52												User B initiates an Ad-hoc IM conference with user A
53											INVITE	UE_B sends INVITE to IMS_A with a MIME resource-list body including invited IM Users and the first SDP offer indicating all specific data for MSRP connection set up
54											100 Trying	IMS_A responds with a 100 Trying provisional response
55											INVITE	IMS_A forwards INVITE to IBCF_A
56											100 Trying	IBCF_A responds with a 100 Trying provisional response
57											INVITE	IBCF_A forwards INVITE to IBCF_B
58											100 Trying	IBCF_B responds with a 100 Trying provisional response
59											INVITE	IBCF_B forwards INVITE to IMS_B
60											100 Trying	IMS_B responds with a 100 Trying provisional response
61											INVITE	IMS_B forwards INVITE to AS/IM_B
62											100 Trying	AS/IM_B responds with a 100 Trying provisional response
63											200 OK	AS/IM_B responds INVITE with 200 OK response with IM session Identity allocated for the current Ad-hoc IM Conference to indicate that the session has been accepted and SDP to inform A-side with specific data for MSRP connection set up
64											200 OK	IMS_B forwards 200 OK response to IBCF_B
65											200 OK	IBCF_B forwards 200 OK response to IBCF_A
66											200 OK	IBCF_A forwards 200 OK response to IMS_A
67											200 OK	IMS_A forwards 200 OK response to UE_B
68												User B is informed that the Ad Hoc IM Conference is established

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
69											ACK	UE_B acknowledges the receipt of 200 OK for INVITE
70											ACK	IMS_A forwards ACK to IBCF_A
71											ACK	IBCF_A forwards ACK to IBCF_B
72											ACK	IBCF_B forwards ACK to IMS_B
73											ACK	IMS_B forwards ACK to AS/IM_B
74											INVITE	AS/IM_B sends INVITE to UE_A with IM session identity (allocated for the current AD-hoc IM Conference), IM address of the Inviting IM UE (UE_B) and Replaces header with the original 1-to-1 session identity
75											100 Trying	IMS_B responds with a 100 Trying provisional response
76											INVITE	IMS_B forwards INVITE to IBCF_B
77											100 Trying	IBCF_B responds with a 100 Trying provisional response
78											INVITE	IBCF_B forwards INVITE to IBCF_A
79											100 Trying	IBCF_A responds with a 100 Trying provisional response
80											INVITE	IBCF_A forwards INVITE to IMS_A
81											100 Trying	IMS_A responds with a 100 Trying provisional response
82											INVITE	IMS_A forwards INVITE to AS/IM_A
83											100 Trying	AS/IM_A responds with a 100 Trying provisional response
84											INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
85											100 Trying	IMS_A responds with a 100 Trying provisional response
86											INVITE	IMS_A forwards INVITE to UE_A
87											100 Trying	UE_A optionally responds with a 100 Trying provisional response
88												User A is informed of incoming invitation from user B to join the Ad-hoc IM Conference
89												User A joins the Ad-hoc IM Conference (automatically)
90											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
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											ACK	AS/IM_B acknowledges the receipt of 200 OK for INVITE
98											ACK	IMS_B forwards ACK to IBCF_B
99											ACK	IBCF_B forwards ACK to IBCF_A

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
100				←							ACK	IBCF_A forwards ACK to IMS_A
101			←								ACK	IMS_A forwards ACK to AS/IM_A
102			→								ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
103		←									ACK	IMS_A forwards ACK to UE_A
104											NOTIFY	AS/IM_B sends NOTIFY to UE_B to inform it that User A has successfully joined the Ad-hoc IM Conference
105								←			NOTIFY	IMS_B forwards NOTIFY to IBCF_B
106						←					NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
107					←						NOTIFY	IBCF_A forwards NOTIFY to IMS_A
108									→		NOTIFY	IMS_A forwards NOTIFY to UE_B
109										⇒		User B is notified that User A has joined the Ad-hoc IM Conference
110											200 OK	UE_B responds with 200 OK to IMS_A
111											200 OK	IMS_A forwards 200 OK response to IBCF_A
112											200 OK	IBCF_A forwards 200 OK response to IBCF_B
113											200 OK	IBCF_B forwards 200 OK response to IMS_B
114											200 OK	IMS_B forwards 200 OK response to AS/IM_B
115				→							BYE	UE_A releases the 1-to-1 IM session with BYE
116			←								BYE	IMS_A forwards BYE to AS/IM_A
117			→								BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
118											BYE	IMS_A forwards BYE to IBCF_A
119											BYE	IBCF_A forwards BYE to IBCF_B
120											BYE	IBCF_B forwards BYE to IMS_B
121											BYE	IMS_B forwards BYE to AS/IM_B
122											BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
123											BYE	IMS_B forwards BYE to IBCF_B
124											BYE	IBCF_B forwards BYE to IBCF_A
125											BYE	IBCF_A forwards BYE to IMS_A
126											BYE	IMS_A forwards BYE to UE_B
127										⇒		User B informed that 1-to-1 IM session with user A has ended
128											200 OK	UE_B sends 200 OK for BYE
129											200 OK	IMS_A forwards 200 OK response to IBCF_A
130											200 OK	IBCF_A forwards 200 OK response to IBCF_B
131											200 OK	IBCF_B forwards 200 OK response to IMS_B
132											200 OK	IMS_B forwards 200 OK response to AS/IM_B
133											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
134											200 OK	IMS_B forwards 200 OK response to IBCF_B
135											200 OK	IBCF_B forwards 200 OK response to IBCF_A
136											200 OK	IBCF_A forwards 200 OK response to IMS_A

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
137			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
138			→								200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
139		←									200 OK	IMS_A forwards 200 OK response to UE_A
140	←											User A informed that 1-to-1 IM session with user B has ended
141	←									→		Users perform enhanced messaging in the Ad-hoc IM Conference
												Continue UC_RCS_8_R (65A-103A)

### 4.5.3.3 Adding users to an Ad-hoc IM Conference

#### 4.5.3.3.1 Adding users to an Ad-hoc IM Conference - interworking

Interoperability Test Description																	
<b>Identifier:</b>	TD_IMS_CHAT_0013																
<b>Summary:</b>	IMS network handles subsequent INVITEs, REFERs and NOTIFYs correctly during addition of user C to an Ad-hoc IM Conferences between users in their home network																
<b>Configuration:</b>	CF_INT_AS																
<b>SUT</b>	IMS_A and IMS_B																
<b>References</b>	<table border="1"> <thead> <tr> <th>Test Purpose</th> <th>Specification Reference</th> </tr> </thead> <tbody> <tr> <td>TP_IMS_5115_02</td> <td>TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4<sup>t</sup> [(a-z)] [(a-z)] numbered list)</td> </tr> <tr> <td>TP_IMS_5115_04</td> <td>TS 124 229 [1], clause 5.4.3.3 ¶92 (item 2 in 4<sup>t</sup> [(a-z)] [(a-z)] numbered list)</td> </tr> </tbody> </table>	Test Purpose	Specification Reference	TP_IMS_5115_02	TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4 <sup>t</sup> [(a-z)] [(a-z)] numbered list)	TP_IMS_5115_04	TS 124 229 [1], clause 5.4.3.3 ¶92 (item 2 in 4 <sup>t</sup> [(a-z)] [(a-z)] numbered list)										
Test Purpose	Specification Reference																
TP_IMS_5115_02	TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4 <sup>t</sup> [(a-z)] [(a-z)] numbered list)																
TP_IMS_5115_04	TS 124 229 [1], clause 5.4.3.3 ¶92 (item 2 in 4 <sup>t</sup> [(a-z)] [(a-z)] numbered list)																
<b>Use Case ref.:</b>	UC_RCS_10_I																
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS B is configured according to table 1</li> <li>UE_A, UE_B and UE_C have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userIM according to table 1</li> <li>IMS_A is configured to contact AS/IM_A</li> <li>UE_B is registered in IMS_B using userIM according to table 1</li> <li>IMS_B is configured to contact AS/IM_B</li> <li>UE_C is registered in IMS_B using userIM according to table 1</li> <li>User A, B and C are subscribed to IM services</li> <li>UE_B and UE_C automatically answer on chat invitation</li> <li>IMS_A within the trust domain of IMS_B</li> <li>User A is pre-provisioned with conference-factory URI in IMS A</li> <li>AS/IM_A server assumes to be a Controlling IM server for Ad-hoc IM Conference sessions</li> <li>IMS_A not configured for topology hiding</li> </ul>																
<b>Test Sequence:</b>	<table border="1"> <thead> <tr> <th>Step</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>User A initiates an Ad-hoc IM conference with user B</td> </tr> <tr> <td>2</td> <td>Verify that User A is informed that the Ad Hoc IM Conference is established</td> </tr> <tr> <td>3</td> <td>Verify that User B is informed of incoming invitation from User A to join the Ad-hoc IM Conference</td> </tr> <tr> <td>4</td> <td>User B joins the Ad-hoc IM Conference (automatically)</td> </tr> <tr> <td>5</td> <td>Verify that User A is notified that User B has joined the Ad-hoc IM Conference</td> </tr> <tr> <td>6</td> <td>Verify that Users perform enhanced messaging in the Ad-hoc IM Conference</td> </tr> <tr> <td>7</td> <td>User A invites User C to join the Ad-hoc IM Conference</td> </tr> </tbody> </table>	Step		1	User A initiates an Ad-hoc IM conference with user B	2	Verify that User A is informed that the Ad Hoc IM Conference is established	3	Verify that User B is informed of incoming invitation from User A to join the Ad-hoc IM Conference	4	User B joins the Ad-hoc IM Conference (automatically)	5	Verify that User A is notified that User B has joined the Ad-hoc IM Conference	6	Verify that Users perform enhanced messaging in the Ad-hoc IM Conference	7	User A invites User C to join the Ad-hoc IM Conference
Step																	
1	User A initiates an Ad-hoc IM conference with user B																
2	Verify that User A is informed that the Ad Hoc IM Conference is established																
3	Verify that User B is informed of incoming invitation from User A to join the Ad-hoc IM Conference																
4	User B joins the Ad-hoc IM Conference (automatically)																
5	Verify that User A is notified that User B has joined the Ad-hoc IM Conference																
6	Verify that Users perform enhanced messaging in the Ad-hoc IM Conference																
7	User A invites User C to join the Ad-hoc IM Conference																

Interoperability Test Description		
	8	Verify that User C is informed of incoming invitation from User A to join the Ad-hoc IM Conference
	9	User C joins the Ad-hoc IM Conference (automatically)
	10	Verify that User A is notified that User C has joined the Ad-hoc IM Conference
	11	Verify that Users perform enhanced messaging in the Ad-hoc IM Conference
	12	User C leaves the Ad-hoc IM Conference
	13	Verify that User C is informed that the Ad-hoc IM Conference has ended
	14	Verify that User A is notified that User C 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
	17	Verify that User A is notified that user B has left the Ad-hoc IM Conference
	18	User A leaves the Ad-hoc IM Conference
	19	Verify that User A is informed that the Ad-hoc IM Conference has ended
Conformance Criteria:	Check	
	1	TP_IMS_5115_02 in CFW step 72 (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-voi_parameter indicating operator_identifier of IMS_A and containing a term-voi_parameter indicating operator_identifier of IMS_B }
	2	TP_IMS_5115_04 in CFW step 72 (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-Asserted-Identity_header indicating the SIP_URI of UE_B and containing a P-Asserted-Identity_header indicating the Tel_URI of UE_B } }

Step	Direction											Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E C	U s e r C			
													Follow UC_RCS_8_I (1-46)
47	→												User A invites User C to join the Ad-hoc IM Conference
48			→										REFER UE_A sends REFER message to IMS_A, with IM session identity (allocated for the current Ad-hoc IM Conference), Refer-To header value equals to UE_C URI and Refer-Sub header value set to "false"
49			←										REFER IMS_A forwards REFER to AS/IM_A
50			→										200 OK AS/IM_A responds with 200 OK to IMS_A
51		←											200 OK IMS_A forwards the 200 OK response to UE_A
52			→										INVITE AS/IM_A sends INVITE to UE_C with IM session identity (allocated for the current AD-hoc IM Conference) and IM address of the Inviting IM UE (UE_A)

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E C	U s e r C		
53			←								100 Trying	IMS_A responds with a 100 Trying provisional response
54				→							INVITE	IMS_A forwards INVITE to IBCF_A
55			←								100 Trying	IBCF_A responds with a 100 Trying provisional response
56				→							INVITE	IBCF_A forwards INVITE to IBCF_B
57			←								100 Trying	IBCF_B responds with a 100 Trying provisional response
58				→							INVITE	IBCF_B forwards INVITE to IMS_B
59			←								100 Trying	IMS_B responds with a 100 Trying provisional response
60				→							INVITE	IMS_B forwards INVITE to AS/IM_B
61				←							100 Trying	AS/IM_B responds with a 100 Trying provisional response
62				←							INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
63				→							100 Trying	IMS_B responds with a 100 Trying provisional response
64				→							INVITE	IMS_B forwards INVITE to UE_C
65											100 Trying	UE_C optionally responds with a 100 Trying provisional response
66										→		User C is informed of incoming invitation from User A to join the Ad-hoc IM Conference
67										←		User C joins the Ad-hoc IM Conference (automatically)
68										←	200 OK	UE_C 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
69										→	200 OK	IMS_B forwards 200 OK response to AS/IM_B
70										←	200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
71										←	200 OK	IMS_B forwards 200 OK response to IBCF_B
72										←	200 OK	IBCF_B forwards 200 OK response to IBCF_A
73										←	200 OK	IBCF_A forwards 200 OK response to IMS_A
74			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
75			→								ACK	AS/IM_A acknowledges the receipt of 200 OK for INVITE
76			→								ACK	IMS_A forwards ACK to IBCF_A
77				→							ACK	IBCF_A forwards ACK to IBCF_B
78											ACK	IBCF_B forwards ACK to IMS_B
79											ACK	IMS_B forwards ACK to AS/IM_B
80											ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
81										→	ACK	IMS_B forwards ACK to UE_C
82			→								NOTIFY	AS/IM_A sends NOTIFY to UE_A to inform it that User C has successfully joined the Ad-hoc IM Conference
83			←								NOTIFY	IMS_A forwards the NOTIFY to UE_A
84	←											User A is notified that User C has joined the Ad-hoc IM Conference

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E C	U s e r C		
85			→								200 OK	UE_A responds with 200 OK to IMS_A
86			←								200 OK	IMS_A forwards the 200 OK response to AS/IM_A
87	←											Users perform enhanced messaging in the Ad-hoc IM Conference
88										←		User C leaves the Ad-hoc IM Conference
89									←		BYE	UE_C sends BYE to IMS_B to leave the Ad-hoc IM Conference
90									→		BYE	IMS_B forwards BYE to AS/IM_B
91									←		BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
92									←		BYE	IMS_B forwards BYE to IBCF_B
93									←		BYE	IBCF_B forwards BYE to IBCF_A
94									←		BYE	IBCF_A forwards BYE to IMS_A
95			←								BYE	IMS_A forwards BYE to AS/IM_A
96			→								200 OK	AS/IM_A sends 200 OK for BYE
97			→								200 OK	IMS_A forwards 200 OK response to IBCF_A
98					→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
99						→					200 OK	IBCF_B forwards 200 OK response to IMS_B
100									→		200 OK	IMS_B forwards 200 OK response to AS/IM_B
101									←		200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
102									→		200 OK	IMS_B forwards 200 OK response to UE_C
103									→			User C is informed that the Ad-hoc IM Conference has ended
104			→								NOTIFY	AS/IM_A sends NOTIFY to IMS_A to inform UE_A that User C has left the Ad-hoc IM Conference
105			←								NOTIFY	IMS_A forwards the NOTIFY to UE_A
106	←											User A is notified that User C has left the Ad-hoc IM Conference
107			→								200 OK	UE_A responds with 200 OK to IMS_A
108			←								200 OK	IMS_A forwards the 200 OK response to AS/IM_A
												Continue UC_RCS_8_I (47A-73A)

#### 4.5.3.3.2 Adding users to an Ad-hoc IM Conference - roaming

Interoperability Test Description					
<b>Identifier:</b>	TD_IMS_CHAT_0014				
<b>Summary:</b>	IMS network handles subsequent INVITEs, REFERs and NOTIFYs correctly during addition of user C to an Ad-hoc IM Conferences between users, one user in its home network and the other user roaming				
<b>Configuration:</b>	CF_ROAM_AS				
<b>SUT</b>	IMS_A and IMS_B				
<b>References</b>	<table border="1"> <thead> <tr> <th>Test Purpose</th> <th>Specification Reference</th> </tr> </thead> <tbody> <tr> <td>TP_IMS_5107_04</td> <td>TS 124 229 [1], clause 5.4.3.2 ¶119 (item</td> </tr> </tbody> </table>	Test Purpose	Specification Reference	TP_IMS_5107_04	TS 124 229 [1], clause 5.4.3.2 ¶119 (item
Test Purpose	Specification Reference				
TP_IMS_5107_04	TS 124 229 [1], clause 5.4.3.2 ¶119 (item				

Interoperability Test Description		
		1 in 8 <sup>th</sup> numbered list)
<b>Use Case ref.:</b>	UC_RCS_10_R	
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>• HSS of IMS_A and of IMS B is configured according to table 1</li> <li>• UE_A, UE_B and UE_C have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>• UE_A is registered in IMS_A using userIM according to table 1</li> <li>• IMS_A is configured to contact AS/IM_A</li> <li>• UE_B is registered in IMS_B via IMS_A using userIM according to table 1</li> <li>• IMS_B is configured to contact AS/IM_B</li> <li>• UE_C is registered in IMS_A using userIM according to table 1</li> <li>• User A, B and C are subscribed to IM services</li> <li>• UE_A and UE_C automatically answer on chat invitation</li> <li>• IMS_A within the trust domain of IMS_B</li> <li>• User B is pre-provisioned with conference-factory URI in IMS B</li> <li>• AS/IM_B server assumes to be a Controlling IM server for Ad-hoc IM Conference sessions</li> <li>• IMS_A not configured for topology hiding</li> </ul>	
<b>Test Sequence:</b>	<b>Step</b>	
	1	User B initiates an Ad-hoc IM conference with user A
	2	Verify that User B is informed that the Ad Hoc IM Conference is established
	3	Verify that User A is informed of incoming invitation from User B to join the Ad-hoc IM Conference
	4	User A joins the Ad-hoc IM Conference (automatically)
	5	Verify that User B is notified that User A has joined the Ad-hoc IM Conference
	6	Verify that Users perform enhanced messaging in the Ad-hoc IM Conference
	7	User B invites User C to join the Ad-hoc IM Conference
	8	Verify that User C is informed of incoming invitation from User B to join the Ad-hoc IM Conference
	9	User C joins the Ad-hoc IM Conference (automatically)
	10	Verify that User B is notified that User C has joined the Ad-hoc IM Conference
	11	Verify that Users perform enhanced messaging in the Ad-hoc IM Conference
	12	User C leaves the Ad-hoc IM Conference
	13	Verify that User C is informed that the Ad-hoc IM Conference has ended
	14	Verify that User B is notified that User C 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
	17	Verify that User B is notified that user A has left the Ad-hoc IM Conference
	18	User B leaves the Ad-hoc IM Conference
	19	Verify that User B is informed that the Ad-hoc IM Conference has ended
<b>Conformance Criteria:</b>	<b>Check</b>	
	1	TP_IMS_5107_04 in CFW in step 68 (REFER): <i>ensure that {</i> <i>  when { IUT receives a REFER from UE_B addressed_to UE_A }</i> <i>  then { IUT sends the REFER to IMS_A</i> <i>        not containing a Route_header</i> <i>        indicating the S-CSCF_SIP_URI of IMS_B }</i> <i>}</i>



Step	Direction										Message	Comment
	U s e r C	U E C	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
65											←	Follow UC_RCS_8_R (1-64) User B invites user C to join the Ad-hoc IM Conference
66												REFER UE_B sends REFER message to IMS_A, with IM session identity (allocated for the current Ad-hoc IM Conference), Refer-To header value equals to UE_C URI and Refer-Sub header value set to "false"
67												REFER IMS_A forwards REFER to IBCF_A
68												REFER IBCF_A forwards REFER to IBCF_B
69												REFER IBCF_B forwards REFER to IMS_B
70												REFER IMS_B forwards REFER to AS/IM_B
71												200 OK AS/IM_B responds with 200 OK 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 UE_B
76												INVITE AS/IM_B sends INVITE to UE_C with IM session identity (allocated for the current AD-hoc IM Conference) and IM address of the Inviting IM UE (UE_B)
77												100 Trying IMS_B responds with a 100 Trying provisional response
78												INVITE IMS_B forwards INVITE to IBCF_B
79												100 Trying IBCF_B responds with a 100 Trying provisional response
80												INVITE IBCF_B forwards INVITE to IBCF_A
81												100 Trying IBCF_A responds with a 100 Trying provisional response
82												INVITE IBCF_A forwards INVITE to IMS_A
83												100 Trying IMS_A responds with a 100 Trying provisional response
84												INVITE IMS_A forwards INVITE to AS/IM_A
85												100 Trying AS/IM_A responds with a 100 Trying provisional response
86												INVITE AS/IM_A returns, possibly modified, INVITE to IMS_A
87												100 Trying IMS_A responds with a 100 Trying provisional response
88												INVITE IMS_A forwards INVITE to UE_C
89												100 Trying UE_C optionally responds with a 100 Trying provisional response
90											←	User C is informed of incoming invitation from User B to join the Ad-hoc IM Conference
91											→	User C joins the Ad-hoc IM Conference (automatically)
92												200 OK UE_C 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

Step	Direction										Message	Comment
	U s e r C	U E C	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
93			←								200 OK	IMS_A forwards 200 OK response to AS/IM_A
94				→							200 OK	AS/IM_A returns, possibly modified, 200 OK response 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									←		ACK	AS/IM_B acknowledges the receipt of 200 OK for INVITE
100										←	ACK	IMS_B forwards ACK to IBCF_B
101										←	ACK	IBCF_B forwards ACK to IBCF_A
102										←	ACK	IBCF_A forwards ACK to IMS_A
103			←								ACK	IMS_A forwards ACK to AS/IM_A
104				→							ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
105		←									ACK	IMS_A forwards ACK to UE_C
106											NOTIFY	AS/IM_B sends NOTIFY to UE_B to inform it that User C has successfully joined the Ad-hoc IM Conference
107										←	NOTIFY	IMS_B forwards NOTIFY to IBCF_B
108										←	NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
109										←	NOTIFY	IBCF_A forwards NOTIFY to IMS_A
110										→	NOTIFY	IMS_A forwards NOTIFY to UE_B
111										⇒		User B is notified that User C has joined the Ad-hoc IM Conference
112											200 OK	UE_B responds with 200 OK to IMS_A
113											200 OK	IMS_A forwards 200 OK response to IBCF_A
114											200 OK	IBCF_A forwards 200 OK response to IBCF_B
115											200 OK	IBCF_B forwards 200 OK response to IMS_B
116											200 OK	IMS_B forwards 200 OK response to AS/IM_B
117	←									→		Users perform enhanced messaging in the Ad-hoc IM Conference
118	⇒											User C leaves the Ad-hoc IM Conference
119											BYE	UE_C sends BYE to IMS_A to leave the Ad-hoc IM Conference
120			←								BYE	IMS_A forwards BYE to AS/IM_A
121				→							BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
122					→						BYE	IMS_A forwards BYE to IBCF_A
123						→					BYE	IBCF_A forwards BYE to IBCF_B
124							→				BYE	IBCF_B forwards BYE to IMS_B
125								→			BYE	IMS_B forwards BYE to AS/IM_B
126									←		200 OK	AS/IM_B sends 200 OK for BYE
127										←	200 OK	IMS_B forwards 200 OK response to IBCF_B
128										←	200 OK	IBCF_B forwards 200 OK response to IBCF_A

Step	Direction											Message	Comment
	U s e r C	U E C	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
129												200 OK	IBCF_A forwards 200 OK response to IMS_A
130												200 OK	IMS_A forwards 200 OK response to AS/IM_A
131												200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
132												200 OK	IMS_A forwards 200 OK response to UE_C
133													User C is informed that the Ad-hoc IM Conference has ended
134												NOTIFY	AS/IM_B sends NOTIFY to IMS_B to inform UE_B that User C has left the Ad-hoc IM Conference
135												NOTIFY	IMS_B forwards NOTIFY to IBCF_B
136												NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
137												NOTIFY	IBCF_A forwards NOTIFY to IMS_A
138												NOTIFY	IMS_A forwards NOTIFY to UE_B
139													User B is notified that User C has left the Ad-hoc IM Conference
140												200 OK	UE_B responds with 200 OK to IMS_A
141												200 OK	IMS_A forwards 200 OK response to IBCF_A
142												200 OK	IBCF_A forwards 200 OK response to IBCF_B
143												200 OK	IBCF_B forwards 200 OK response to IMS_B
144												200 OK	IMS_B forwards 200 OK response to AS/IM_B
													Continue UC_RCS_8_R (65A-103A)

#### 4.5.3.4 Rejoining an Ad-hoc IM Conference until its timeout

##### 4.5.3.4.1 Rejoining an Ad-hoc IM Conference until its timeout - interworking

Interoperability Test Description					
<b>Identifier:</b>	TD_IMS_CHAT_0015				
<b>Summary:</b>	IMS network handles subsequent INVITEs and NOTIFYs correctly during rejoining of user B to existing Ad-hoc IM Conferences between users in their home network				
<b>Configuration:</b>	CF_INT_AS				
<b>SUT</b>	IMS_A and IMS_B				
<b>References</b>	<table border="1"> <thead> <tr> <th>Test Purpose</th> <th>Specification Reference</th> </tr> </thead> <tbody> <tr> <td>TP_IMS_5110_01</td> <td>TS 124 229 [1], clause 5.4.3.3 ¶79 (after 6<sup>th</sup> dashed list)</td> </tr> </tbody> </table>	Test Purpose	Specification Reference	TP_IMS_5110_01	TS 124 229 [1], clause 5.4.3.3 ¶79 (after 6 <sup>th</sup> dashed list)
Test Purpose	Specification Reference				
TP_IMS_5110_01	TS 124 229 [1], clause 5.4.3.3 ¶79 (after 6 <sup>th</sup> dashed list)				
<b>Use Case ref.:</b>	UC_RCS_8_I				
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userIM according to table 1</li> <li>IMS_A is configured to contact AS/IM_A</li> <li>UE_B is registered in IMS_B using userIM according to table 1</li> <li>IMS_B is configured to contact AS/IM_B</li> <li>User A and B are subscribed to IM services</li> <li>UE_B automatically answer on chat invitation</li> <li>IMS_A within the trust domain of IMS_B</li> </ul>				

Interoperability Test Description		
	<ul style="list-style-type: none"> <li>User A is pre-provisioned with conference-factory URI in IMS A</li> <li>UE_B is able to store IM Session Identity after leaving the conference</li> <li>AS/IM_A server assumes to be a Controlling IM server for Ad-hoc IM Conference sessions</li> <li>IMS_A not configured for topology hiding</li> </ul>	
<b>Test Sequence:</b>	<b>Step</b>	
	1	User A initiates an Ad-hoc IM conference with user B
	2	Verify that User A is informed that the Ad Hoc IM Conference is established
	3	Verify that User B is informed of incoming invitation from User A to join the Ad-hoc IM Conference
	4	User B joins the Ad-hoc IM Conference (automatically)
	5	Verify that User A is notified that User B has joined the Ad-hoc IM Conference
	6	Verify that users perform enhanced messaging in the Ad-hoc IM Conference
	7	User B leaves the Ad-hoc IM Conference
	8	Verify that User B is informed that the Ad-hoc IM Conference has ended
	9	Verify that User A is notified that user B has left the Ad-hoc IM Conference
	10	User B decides to rejoin the Ad-hoc IM conference
	11	Verify that User B is informed that it has successfully rejoined the Ad-hoc IM conference
	12	Verify that User A is notified that User B has rejoined the Ad-hoc IM Conference
	13	Verify that Users perform enhanced messaging in the Ad-hoc IM Conference
	14	User A leaves the Ad-hoc IM Conference
	15	Verify that User A is informed that the Ad-hoc IM Conference has ended
	16	User B is informed that the Ad-hoc IM Conference has ended
<b>Conformance Criteria:</b>	<b>Check</b>	
	1	TP_IMS_5110_01 in CFW step 85 (200 OK) ensure that { when { IMS_A receives a 200_response from AS_A addressed_to UE_B } then { IMS_A sends the 200_response to IMS_B } }

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
												Follow UC_RCS_8_I (1-67A)
68												User B decides to rejoin the Ad-hoc IM conference
69											INVITE	UE_B sends INVITE to AS/IM_A with IM session identity (stored in the IM Client for the current Ad-hoc IM Conference) to inform AS/IM_A that User B wants to rejoin the Ad-hoc IM conference session
70											100 Trying	IMS_A responds with a 100 Trying provisional response
71											INVITE	IMS_B forwards INVITE to AS/IM_B
72											100 Trying	IMS_A responds with a 100 Trying provisional response
73											INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
74											100 Trying	IMS_A responds with a 100 Trying provisional response
75											INVITE	IMS_B forwards INVITE to IBCF_B
76											100 Trying	IMS_A responds with a 100 Trying provisional response
77											INVITE	IBCF_B forwards INVITE to IBCF_A

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
78											100 Trying	IMS_A responds with a 100 Trying provisional response
79											INVITE	IBCF_A forwards INVITE to IMS_A
80											100 Trying	IMS_A responds with a 100 Trying provisional response
81											INVITE	IMS_A forwards INVITE to AS/IM_A
82											100 Trying	IMS_A responds with a 100 Trying provisional response
83											200 OK	AS/IM_A responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform UE_B with specific data for MSRP connection set up
84											200 OK	IMS_A forwards 200 OK response to IBCF_A
85											200 OK	IBCF_A forwards 200 OK response to IBCF_B
86											200 OK	IBCF_B forwards 200 OK response to IMS_B
87											200 OK	IMS_B forwards 200 OK response to AS/IM_B
88											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
89											200 OK	IMS_B forwards 200 OK response to UE_B
90												Verify that User B is informed that it has successfully rejoined the Ad-hoc IM conference
91											ACK	UE_B acknowledges the receipt of 200 OK for INVITE
92											ACK	IMS_B forwards ACK to AS/IM_B
93											ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
94											ACK	IMS_B forwards ACK to IBCF_B
95											ACK	IBCF_B forwards ACK to IBCF_A
96											ACK	IBCF_A forwards ACK to IMS_A
97											ACK	IMS_A forwards ACK to AS/IM_A
98											NOTIFY	AS/IM_A sends NOTIFY to UE_A to inform it that User B has rejoined the Ad-hoc IM Conference
99											NOTIFY	IMS_A forwards the NOTIFY to UE_A
100												User A is notified that User B has rejoined the Ad-hoc IM Conference
101											200 OK	UE_A responds with 200 OK to IMS_A
102											200 OK	IMS_A forwards the 200 OK response to AS/IM_A
103												Users perform enhanced messaging in the Ad-hoc IM Conference
												Continue UC_RCS_8_I (47B-67B)

## 4.5.3.4.2 Rejoining an Ad-hoc IM Conference until its timeout - roaming

Interoperability Test Description		
<b>Identifier:</b>	TD_IMS_CHAT_0016	
<b>Summary:</b>	IMS network handles subsequent INVITEs and NOTIFYs correctly during rejoining of user B to existing Ad-hoc IM Conferences between users, one user in its home network and the other user roaming	
<b>Configuration:</b>	CF_ROAM_AS	
<b>SUT</b>	IMS_A and IMS_B	
<b>References</b>	<b>Test Purpose</b>	<b>Specification Reference</b>
	TP_IMS_5097_09	TS 124 229 [1], clause 5.4.3.2 ¶11 (items 5 and 8 in 1 <sup>st</sup> numbered list)
<b>Use Case ref.:</b>	UC_RCS_8_R	
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>• HSS of IMS_A and of IMS B is configured according to table 1</li> <li>• UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>• UE_A is registered in IMS_A using userIM according to table 1</li> <li>• IMS_A is configured to contact AS/IM_A</li> <li>• UE_B is registered in IMS_B via IMS_A using userIM according to table 1</li> <li>• IMS_B is configured to contact AS/IM_B</li> <li>• User A and B are subscribed to IM services</li> <li>• UE_A automatically answer on chat invitation</li> <li>• IMS_A within the trust domain of IMS_B</li> <li>• User B is pre-provisioned with conference-factory URI in IMS B</li> <li>• UE_A is able to store IM Session Identity after leaving the conference</li> <li>• AS/IM_B server assumes to be a Controlling IM server for Ad-hoc IM Conference sessions</li> <li>• IMS_A not configured for topology hiding</li> </ul>	
<b>Test Sequence:</b>	<b>Step</b>	
	1	User B initiates an Ad-hoc IM conference with user A
	2	Verify that User B is informed that the Ad Hoc IM Conference is established
	3	Verify that User A is informed of incoming invitation from User B to join the Ad-hoc IM Conference
	4	User A joins the Ad-hoc IM Conference (automatically)
	5	Verify that User B is notified that User A has joined the Ad-hoc IM Conference
	6	Verify that users perform enhanced messaging in the Ad-hoc IM Conference
	7	User A leaves the Ad-hoc IM Conference
	8	Verify that User A is informed that the Ad-hoc IM Conference has ended
	9	Verify that User B is notified that user A has left the Ad-hoc IM Conference
	10	User A decides to rejoin the Ad-hoc IM conference
	11	Verify that User A is informed that it has successfully rejoined the Ad-hoc IM conference
	12	Verify that User B is notified that User A has rejoined the Ad-hoc IM Conference
	13	Verify that Users perform enhanced messaging in the Ad-hoc IM Conference
	14	User B leaves the Ad-hoc IM Conference
	15	Verify that User B is informed that the Ad-hoc IM Conference has ended
16	User A is informed that the Ad-hoc IM Conference has ended	

Interoperability Test Description		
Conformance Criteria:	Check	
	1	TP_IMS_5097_09 in CFW step 105 (INVITE) ensure that { when { IUT receives an INVITE from IMS_A from UE_B } then {IUT sends the 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 including an orig-ioi_parameter indicating the operator_identifier of IMS_A and not including a term-ioi_parameter and including access-network-charging-info } }

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
												Follow UC_RCS_8_R (1-91A)
92		⇒										User A decides to rejoin the Ad-hoc IM conference
93											INVITE	UE_A sends INVITE to AS/IM_B with IM session identity (stored in the IM Client for the current Ad-hoc IM Conference) to inform AS/IM_B that User A wants to rejoin the Ad-hoc IM conference session
94											100 Trying	IMS_A responds with a 100 Trying provisional response
95											INVITE	IMS_A forwards INVITE to AS/IM_A
96											100 Trying	AS/IM_A responds with a 100 Trying provisional response
97											INVITE	AS/IM_A returns, possibly modified, INVITE to IMS_A
98											100 Trying	IMS_A responds with a 100 Trying provisional response
99											INVITE	IMS_A forwards INVITE to IBCF_A
100											100 Trying	IBCF_A responds with a 100 Trying provisional response
101											INVITE	IBCF_A forwards INVITE to IBCF_B
102											100 Trying	IBCF_B responds with a 100 Trying provisional response
103											INVITE	IBCF_B forwards INVITE to IMS_B
104											100 Trying	IMS_B responds with a 100 Trying provisional response
105											INVITE	IMS_B forwards INVITE to AS/IM_B
106											100 Trying	AS/IM_B responds with a 100 Trying provisional response
107											200 OK	AS/IM_B responds INVITE with 200 OK response with SDP to indicate that the session has been accepted and inform UE_A with specific data for MSRP connection set up
108											200 OK	IMS_B forwards 200 OK response to IBCF_B
109											200 OK	IBCF_B forwards 200 OK response to IBCF_A
110											200 OK	IBCF_A forwards 200 OK response to IMS_A
111											200 OK	IMS_A forwards 200 OK response to AS/IM_A

Step	Direction											Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
112												200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
113												200 OK	IMS_A forwards 200 OK response to UE_A
114													Verify that User A is informed that it has successfully rejoined the Ad-hoc IM conference
115												ACK	UE_A acknowledges the receipt of 200 OK for INVITE
116												ACK	IMS_A forwards ACK to AS/IM_A
117												ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
118												ACK	IMS_A forwards ACK to IBCF_A
119												ACK	IBCF_A forwards ACK to IBCF_B
120												ACK	IBCF_B forwards ACK to IMS_B
121												ACK	IMS_B forwards ACK to AS/IM_B
122												NOTIFY	AS/IM_B sends NOTIFY to UE_B to inform it that User A has rejoined the Ad-hoc IM Conference
123												NOTIFY	IMS_B forwards NOTIFY to IBCF_B
124												NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
125												NOTIFY	IBCF_A forwards NOTIFY to IMS_A
126												NOTIFY	IMS_A forwards NOTIFY to UE_B
127													User B is notified that User A has rejoined the Ad-hoc IM Conference
128												200 OK	UE_B responds with 200 OK to IMS_A
129												200 OK	IMS_A forwards 200 OK response to IBCF_A
130												200 OK	IBCF_A forwards 200 OK response to IBCF_B
131												200 OK	IBCF_B forwards 200 OK response to IMS_B
132												200 OK	IMS_B forwards 200 OK response to AS/IM_B
133													Users perform enhanced messaging in the Ad-hoc IM Conference
													Continue UC_RCS_8_R (65B-91B)

## 4.5.4 File transfer

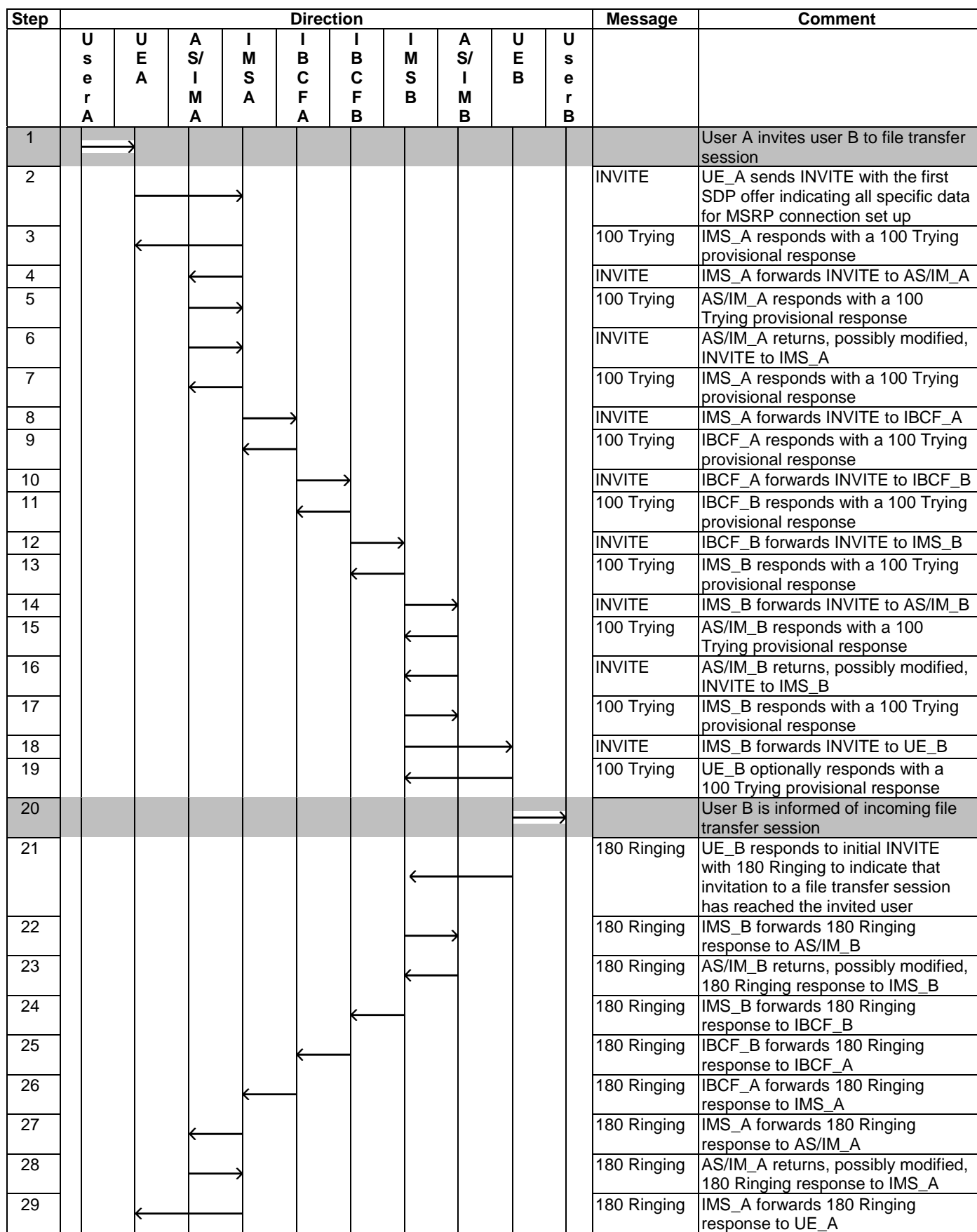
### 4.5.4.1 File transfer with explicit user acceptance

#### 4.5.4.1.1 File transfer with explicit user acceptance - interworking

Interoperability Test Description					
<b>Identifier:</b>	TD_IMS_FILE_0001				
<b>Summary:</b>	IMS network supports file transfer service and file between two users in their home network can be performed. User B must explicitly accept the file transfer.				
<b>Configuration:</b>	CF_INT_AS				
<b>SUT</b>	IMS_A and IMS_B				
<b>References</b>	<table border="1"> <thead> <tr> <th>Test Purpose</th> <th>Specification Reference</th> </tr> </thead> <tbody> <tr> <td>TP_IMS_5097_01</td> <td>TS 124 229 [1], clause 5.4.3.2 ¶11 (1<sup>st</sup> numbered list)</td> </tr> </tbody> </table>	Test Purpose	Specification Reference	TP_IMS_5097_01	TS 124 229 [1], clause 5.4.3.2 ¶11 (1 <sup>st</sup> numbered list)
Test Purpose	Specification Reference				
TP_IMS_5097_01	TS 124 229 [1], clause 5.4.3.2 ¶11 (1 <sup>st</sup> numbered list)				



Interoperability Test Description		
	TP_IMS_5108_03	TS 124 229 [1], clause 5.4.3.3 ¶5 (item 4 in 1 <sup>st</sup> numbered list)
	TP_IMS_5115_08	TS 124 229 [1], clause 5.4.3.3 ¶89 (4 <sup>th</sup> numbered list)
<b>Use Case ref.:</b>	UC_RCS_5_I	
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>• HSS of IMS_A and of IMS B is configured according to table 1</li> <li>• UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>• UE_A is registered in IMS_A using userFT according to table 1</li> <li>• IMS_A is configured to contact AS_A (IM_A)</li> <li>• UE_B is registered in IMS_B using userFT according to table 1</li> <li>• IMS_B is configured to contact AS_B (IM_B)</li> <li>• User A and B are subscribed to file transfer service</li> <li>• User B supports interaction on file transfer invitation</li> <li>• IMS_A within the trust domain of IMS_B</li> <li>• IMS_A not configured for topology hiding</li> </ul>	
<b>Test Sequence:</b>	<b>Step</b>	
	1	User A starts file transfer invitation to User B
	2	Verify that user B is informed of file transfer invitation
	3	Verify that user A is informed that UE_B is ringing
	4	User B accepts file transfer invitation
	5	Verify that users can perform file transfer
	6	User A releases file transfer session after file is transferred
	7	Verify that user B is informed that file transfer session has been released
	8	Verify that user A is informed that file transfer session has been released
<b>Conformance Criteria:</b>	<b>Check</b>	
	1	TP_IMS_5097_01 in CFW step 10 (INVITE): <i>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 } }</i>
	2	TP_IMS_5108_03 in CFW step 14 (INVITE) <i>ensure that { when {IMS_B receives an initial INVITE from IMS_A addressed_to UE_B} then {IMS_B 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 IMS_B and containing a P-Charging-Vector_header including a orig-ioi_parameter indicating operator_identifier of IMS_A and not including a term-ioi_parameter } }</i>
	3	TP_IMS_5115_08 in CFW step 35 (200 OK) <i>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 } }</i>



Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
30												User A is informed that invitation to a file transfer session has reached user B
31												User B accepts the invitation to a file transfer session
32											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
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 AS/IM_A
39											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
40											200 OK	IMS_A forwards 200 OK response to UE_A
41											ACK	UE_A acknowledges the receipt of 200 OK for INVITE
42											ACK	IMS_A forwards ACK to AS/IM_A
43											ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
44											ACK	IMS_A forwards ACK to IBCF_A
45											ACK	IBCF_A forwards ACK to IBCF_B
46											ACK	IBCF_B forwards ACK to IMS_B
47											ACK	IMS_B forwards ACK to AS/IM_B
48											ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
49											ACK	IMS_B forwards ACK to UE_B
50												Users perform file transfer
51A												User A ends the file transfer session
52A											BYE	UE_A releases the file transfer session with BYE
53A											BYE	IMS_A forwards BYE to AS/IM_A
54A											BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
55A											BYE	IMS_A forwards BYE to IBCF_A
56A											BYE	IBCF_A forwards BYE to IBCF_B
57A											BYE	IBCF_B forwards BYE to IMS_B
58A											BYE	IMS_B forwards BYE to AS/IM_B
59A											BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
60A											BYE	IMS_B forwards BYE to UE_B
61A												User B is informed that file transfer session has ended
62A											200 OK	UE_B sends 200 OK for BYE
63A											200 OK	IMS_B forwards 200 OK response to AS/IM_B
64A											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
65A											←	200 OK	IMS_B forwards 200 OK response to IBCF_B
66A											←	200 OK	IBCF_B forwards 200 OK response to IBCF_A
67A											←	200 OK	IBCF_A forwards 200 OK response to IMS_A
68A											←	200 OK	IMS_A forwards 200 OK response to AS/IM_A
69A											→	200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
70A											←	200 OK	IMS_A forwards 200 OK response to UE_A
71A											←		User A is informed that file transfer session has ended

#### 4.5.4.1.2 File transfer with explicit user acceptance - roaming

Interoperability Test Description																			
<b>Identifier:</b>	TD_IMS_FILE_0002																		
<b>Summary:</b>	IMS network supports file transfer service and file transfer between two users, one user in its home network and one user roaming can be performed. User B must explicitly accept the file transfer.																		
<b>Configuration:</b>	CF_ROAM_AS																		
<b>SUT</b>	IMS_A and IMS_B																		
<b>References</b>	<table border="1"> <thead> <tr> <th>Test Purpose</th> <th>Specification Reference</th> </tr> </thead> <tbody> <tr> <td>TP_IMS_5046_01</td> <td>TS 124 229 [1], clause 5.2.6.3.3 ¶1 (1<sup>st</sup> numbered list)</td> </tr> <tr> <td>TP_IMS_5067_01</td> <td>TS 124 229 [1], clause 5.2.7.2 ¶5</td> </tr> <tr> <td>TP_IMS_5097_09</td> <td>TS 124 229 [1], clause 5.4.3.2 ¶11 (items 5 and 8 in 1<sup>st</sup> numbered list)</td> </tr> </tbody> </table>	Test Purpose	Specification Reference	TP_IMS_5046_01	TS 124 229 [1], clause 5.2.6.3.3 ¶1 (1 <sup>st</sup> 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 1 <sup>st</sup> numbered list)										
Test Purpose	Specification Reference																		
TP_IMS_5046_01	TS 124 229 [1], clause 5.2.6.3.3 ¶1 (1 <sup>st</sup> 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 1 <sup>st</sup> numbered list)																		
<b>Use Case ref.:</b>	UC_RCS_5_R																		
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userFT according to table 1</li> <li>IMS_A is configured to contact AS_A (IM_A)</li> <li>UE_B is registered in IMS_B via IMS_A using userFT according to table 1</li> <li>IMS_B is configured to contact AS_B (IM_B)</li> <li>User A and B are subscribed to file transfer service</li> <li>User B supports interaction on file transfer invitation</li> <li>IMS_A within the trust domain of IMS_B</li> <li>IMS_A not configured for topology hiding</li> </ul>																		
<b>Test Sequence:</b>	<table border="1"> <thead> <tr> <th>Step</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>User B starts file transfer invitation to User A</td> </tr> <tr> <td>2</td> <td>Verify that user A is informed of file transfer invitation</td> </tr> <tr> <td>3</td> <td>Verify that user B is informed that UE_A is ringing</td> </tr> <tr> <td>4</td> <td>User A accepts file transfer invitation</td> </tr> <tr> <td>5</td> <td>Verify that users can perform file transfer</td> </tr> <tr> <td>6</td> <td>User B releases file transfer session after file is transferred</td> </tr> <tr> <td>7</td> <td>Verify that user A is informed that file transfer session has been released</td> </tr> <tr> <td>8</td> <td>Verify that user B is informed that file transfer session has been released</td> </tr> </tbody> </table>	Step		1	User B starts file transfer invitation to User A	2	Verify that user A is informed of file transfer invitation	3	Verify that user B is informed that UE_A is ringing	4	User A accepts file transfer invitation	5	Verify that users can perform file transfer	6	User B releases file transfer session after file is transferred	7	Verify that user A is informed that file transfer session has been released	8	Verify that user B is informed that file transfer session has been released
Step																			
1	User B starts file transfer invitation to User A																		
2	Verify that user A is informed of file transfer invitation																		
3	Verify that user B is informed that UE_A is ringing																		
4	User A accepts file transfer invitation																		
5	Verify that users can perform file transfer																		
6	User B releases file transfer session after file is transferred																		
7	Verify that user A is informed that file transfer session has been released																		
8	Verify that user B is informed that file transfer session has been released																		

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

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
1											←	User B invites user A to file transfer session
2				←							INVITE	UE_B sends INVITE to IMS_A with the first SDP offer indicating all
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	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r 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 transfer session
27							→					180 Ringing	UE_A responds to initial INVITE with 180 Ringing to indicate that invitation
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

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r 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												User B is informed that invitation to a file transfer session has reached
40												User A accepts the invitation to a file transfer session
41											200 OK	UE_A responds INVITE with 200 OK response with SDP to indicate that
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 IBCF_B
50											200 OK	IBCF_B forwards 200 OK response to IBCF_A
51											200 OK	IBCF_A forwards 200 OK response to IMS_A
52											200 OK	IMS_A forwards 200 OK response to UE_B
53											ACK	UE_B acknowledges the receipt of 200 OK for INVITE
54											ACK	IMS_A forwards ACK to IBCF_A
55											ACK	IBCF_A forwards ACK to IBCF_B
56											ACK	IBCF_B forwards ACK to IMS_B
57											ACK	IMS_B forwards ACK to AS/IM_B
58											ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
59											ACK	IMS_B forwards ACK to IBCF_B
60											ACK	IBCF_B forwards ACK to IBCF_A
61											ACK	IBCF_A forwards ACK to IMS_A
62											ACK	IMS_A forwards ACK to AS/IM_A

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
63												ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
64												ACK	IMS_A forwards ACK to UE_A
65													Users perform file transfer
66A													User B ends the file transfer session
67A												BYE	UE_B releases the file transfer session with BYE
68A												BYE	IMS_A forwards BYE to IBCF_A
69A												BYE	IBCF_A forwards BYE to IBCF_B
70A												BYE	IBCF_B forwards BYE to IMS_B
71A												BYE	IMS_B forwards BYE to AS/IM_B
72A												BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
73A												BYE	IMS_B forwards BYE to IBCF_B
74A												BYE	IBCF_B forwards BYE to IBCF_A
75A												BYE	IBCF_A forwards BYE to IMS_A
76A												BYE	IMS_A forwards BYE to AS/IM_A
77A												BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
78A												BYE	IMS_A forwards BYE to UE_A
79A													User A is informed that file transfer session has ended
80A												200 OK	UE_A sends 200 OK for BYE
81A												200 OK	IMS_A forwards 200 OK response to AS/IM_A
82A												200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
83A												200 OK	IMS_A forwards 200 OK response to IBCF_A
84A												200 OK	IBCF_A forwards 200 OK response to IBCF_B
85A												200 OK	IBCF_B forwards 200 OK response to IMS_B
86A												200 OK	IMS_B forwards 200 OK response to AS/IM_B
87A												200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
88A												200 OK	IMS_B forwards 200 OK response to IBCF_B
89A												200 OK	IBCF_B forwards 200 OK response to IBCF_A
90A												200 OK	IBCF_A forwards 200 OK response to IMS_A



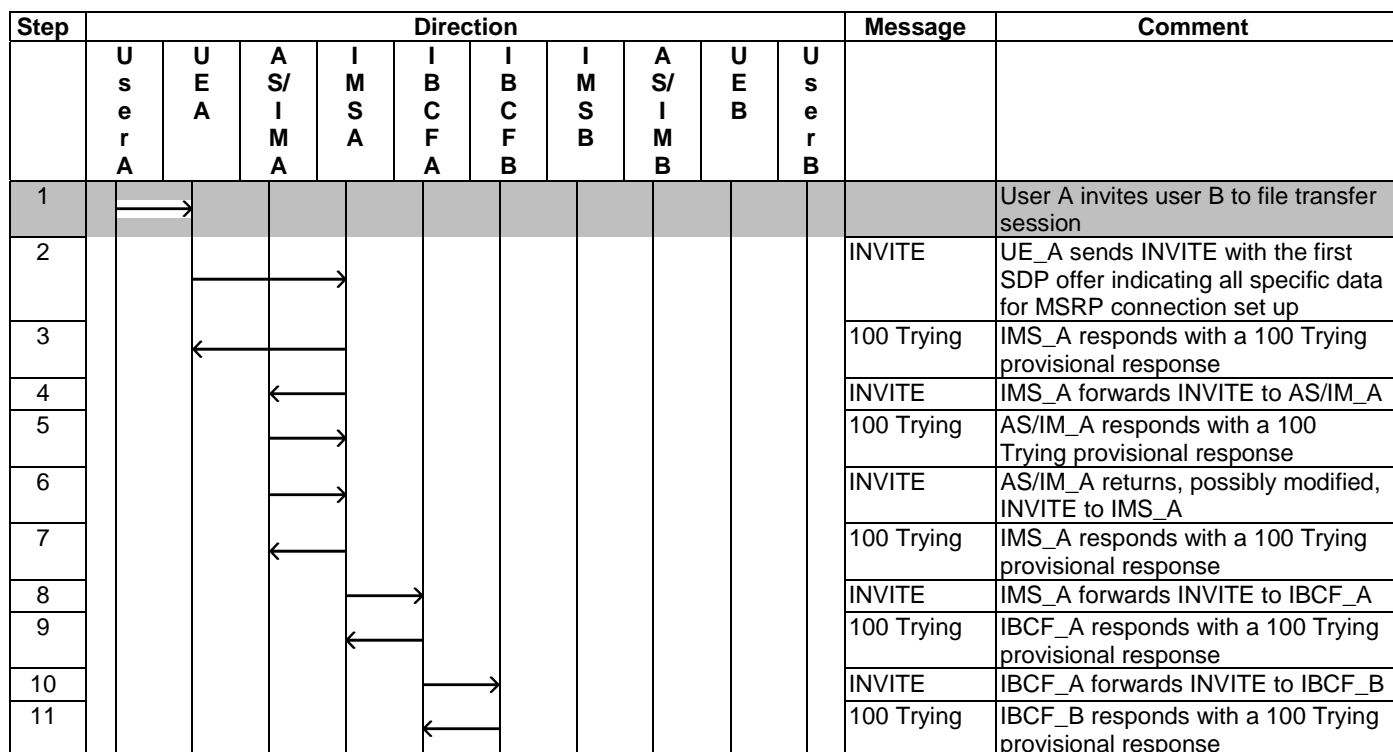
Step	Direction											Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
91A												200 OK	IMS_A forwards 200 OK response to UE_B
92A													User B is informed that file transfer session has ended

#### 4.5.4.2 File transfer with immediate acceptance

##### 4.5.4.2.1 File transfer with immediate acceptance - interworking

Interoperability Test Description		
<b>Identifier:</b>	TD_IMS_FILE_0003	
<b>Summary:</b>	IMS network supports file transfer service and file between two users in their home network can be performed. Immediate response applies.	
<b>Configuration:</b>	CF_INT_AS	
<b>SUT</b>	IMS_A and IMS_B	
<b>References</b>	<b>Test Purpose</b>	<b>Specification Reference</b>
	TP_IMS_5097_01	TS 124 229 [1], clause 5.4.3.2 ¶11 (item 9 in 1 <sup>st</sup> numbered list)
	TP_IMS_5108_03	TS 124 229 [1], clause 5.4.3.3 ¶5 (item 4 in 1 <sup>st</sup> numbered list)
	TP_IMS_5115_08	TS 124 229 [1], clause 5.4.3.3 ¶89 (4 <sup>th</sup> numbered list)
<b>Use Case ref.:</b>	UC_RCS_4_I	
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS_B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userFT according to table 1</li> <li>IMS_A is configured to contact AS_A (IM_A)</li> <li>UE_B is registered in IMS_B using userFT according to table 1</li> <li>IMS_B is configured to contact AS_B (IM_B)</li> <li>User A and B are subscribed to file transfer service</li> <li>UE_B automatically answer on file transfer invitation</li> <li>IMS_A within the trust domain of IMS_B</li> <li>IMS_A not configured for topology hiding</li> </ul>	
<b>Test Sequence:</b>	<b>Step</b>	
	1	User A starts file transfer invitation to User B
	2	User B automatically accepts file transfer invitation
	3	Verify that users can perform file transfer
	4	User A releases file transfer session after file is transferred
	5	Verify that user B is informed that file transfer session has been released
6	Verify that user A is informed that file transfer session has been released	

Interoperability Test Description		
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 {IMS_B receives an initial INVITE from IMS_A addressed_to UE_B} then {IMS_B 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 IMS_B and containing a P-Charging-Vector_header including a orig-ioi_parameter indicating operator_identifier of IMS_A and not including 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	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
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 transfer session
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 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												ACK	UE_A acknowledges the receipt of 200 OK for INVITE
31												ACK	IMS_A forwards ACK to AS/IM_A
32												ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
33												ACK	IMS_A forwards ACK to IBCF_A
34												ACK	IBCF_A forwards ACK to IBCF_B
35												ACK	IBCF_B forwards ACK to IMS_B
36												ACK	IMS_B forwards ACK to AS/IM_B
37												ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
38												ACK	IMS_B forwards ACK to UE_B
39													Users perform file transfer
40A													User A ends the file transfer session
41A												BYE	UE_A releases the file transfer session with BYE
42A												BYE	IMS_A forwards BYE to AS/IM_A
43A												BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
44A												BYE	IMS_A forwards BYE to IBCF_A
45A												BYE	IBCF_A forwards BYE to IBCF_B
46A												BYE	IBCF_B forwards BYE to IMS_B
47A												BYE	IMS_B forwards BYE to AS/IM_B

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
48A											←	BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
49A											→	BYE	IMS_B forwards BYE to UE_B
50A											⇔		User B is informed that file transfer session has ended
51A											←	200 OK	UE_B sends 200 OK for BYE
52A											→	200 OK	IMS_B forwards 200 OK response to AS/IM_B
53A											←	200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
54A											←	200 OK	IMS_B forwards 200 OK response to IBCF_B
55A											←	200 OK	IBCF_B forwards 200 OK response to IBCF_A
56A											←	200 OK	IBCF_A forwards 200 OK response to IMS_A
57A											←	200 OK	IMS_A forwards 200 OK response to AS/IM_A
58A											→	200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
59A											←	200 OK	IMS_A forwards 200 OK response to UE_A
60A											←		User A is informed that file transfer session has ended

## 4.5.4.2.2 File transfer with immediate acceptance - roaming

Interoperability Test Description									
<b>Identifier:</b>	TD_IMS_FILE_0004								
<b>Summary:</b>	IMS network supports file transfer service and file transfer between two users, one user in its home network and one user roaming can be performed. Immediate response applies.								
<b>Configuration:</b>	CF_ROAM_AS								
<b>SUT</b>	IMS_A and IMS_B								
<b>References</b>	<table border="1"> <thead> <tr> <th>Test Purpose</th> <th>Specification Reference</th> </tr> </thead> <tbody> <tr> <td>TP_IMS_5046_01</td> <td>TS 124 229 [1], clause 5.2.6.3.3 ¶1 (1<sup>st</sup> numbered list)</td> </tr> <tr> <td>TP_IMS_5067_01</td> <td>TS 124 229 [1], clause 5.2.7.2 ¶5</td> </tr> <tr> <td>TP_IMS_5097_09</td> <td>TS 124 229 [1], clause 5.4.3.2 ¶11 (items 5 and 8 in 1<sup>st</sup> numbered list)</td> </tr> </tbody> </table>	Test Purpose	Specification Reference	TP_IMS_5046_01	TS 124 229 [1], clause 5.2.6.3.3 ¶1 (1 <sup>st</sup> 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 1 <sup>st</sup> numbered list)
Test Purpose	Specification Reference								
TP_IMS_5046_01	TS 124 229 [1], clause 5.2.6.3.3 ¶1 (1 <sup>st</sup> 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 1 <sup>st</sup> numbered list)								
<b>Use Case ref.:</b>	UC_RCS_4_R								
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userFT according to table 1</li> <li>IMS_A is configured to contact AS_A (IM_A)</li> <li>UE_B is registered in IMS_B via IMS_A using userFT according to table 1</li> <li>IMS_B is configured to contact AS_B (IM_B)</li> <li>User A and B are subscribed to file transfer service</li> <li>UE_B automatically answer on file transfer invitation</li> <li>IMS_A within the trust domain of IMS_B</li> <li>IMS_A not configured for topology hiding</li> </ul>								

Interoperability Test Description		
<b>Test Sequence:</b>	<b>Step</b>	
	1	User B starts file transfer invitation to User A
	2	User A automatically accepts file transfer invitation
	3	Verify that users can perform file transfer
	4	User B releases file transfer session after file is transferred
	5	Verify with UE_A that file transfer session has been released
	6	Verify with UE_B that file transfer session has been released
<b>Conformance Criteria:</b>	<b>Check</b>	
	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 { IMS_B receives an initial INVITE from IMS_A addressed to UE_A } then { IMS_B 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 (including a orig-ioi_parameter indicating operator_identifier of IMS_A and not including a term-ioi_parameter and including access-network-charging-info) } }

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
1												User B invites user A to file transfer session
2											INVITE	UE_B sends INVITE to IMS_A with 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
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 transfer session
27											200 OK	UE_A 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
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
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r 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											ACK	UE_B acknowledges the receipt of 200 OK for INVITE
40											ACK	IMS_A forwards ACK to IBCF_A
41											ACK	IBCF_A forwards ACK to IBCF_B
42											ACK	IBCF_B forwards ACK to IMS_B
43											ACK	IMS_B forwards ACK to AS/IM_B
44											ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
45											ACK	IMS_B forwards ACK to IBCF_B
46											ACK	IBCF_B forwards ACK to IBCF_A
47											ACK	IBCF_A forwards ACK to IMS_A
48											ACK	IMS_A forwards ACK to AS/IM_A
49											ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
50											ACK	IMS_A forwards ACK to UE_A
51												Users perform file transfer
52A												User B ends the file transfer session
53A											BYE	UE_B releases the file transfer session with BYE
54A											BYE	IMS_A forwards BYE to IBCF_A
55A											BYE	IBCF_A forwards BYE to IBCF_B
56A											BYE	IBCF_B forwards BYE to IMS_B
57A											BYE	IMS_B forwards BYE to AS/IM_B
58A											BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
59A											BYE	IMS_B forwards BYE to IBCF_B
60A											BYE	IBCF_B forwards BYE to IBCF_A
61A											BYE	IBCF_A forwards BYE to IMS_A
62A											BYE	IMS_A forwards BYE to AS/IM_A
63A											BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
64A											BYE	IMS_A forwards BYE to UE_A
65A												User A is informed that file transfer session has ended
66A											200 OK	UE_A sends 200 OK for BYE
67A											200 OK	IMS_A forwards 200 OK response to AS/IM_A
68A											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
69A											200 OK	IMS_A forwards 200 OK response to IBCF_A
70A											200 OK	IBCF_A forwards 200 OK response to IBCF_B

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
71A											200 OK	IBCF_B forwards 200 OK response to IMS_B
72A											200 OK	IMS_B forwards 200 OK response to AS/IM_B
73A											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
74A											200 OK	IMS_B forwards 200 OK response to IBCF_B
75A											200 OK	IBCF_B forwards 200 OK response to IBCF_A
76A											200 OK	IBCF_A forwards 200 OK response to IMS_A
77A											200 OK	IMS_A forwards 200 OK response to UE_B
78A												User B is informed that file transfer session has ended
52BA												User A ends the file transfer session
53B											BYE	UE_A releases the file transfer session with BYE
54B											BYE	IMS_A forwards BYE to AS/IM_A
55B											BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
56B											BYE	IMS_A forwards BYE to IBCF_A
57B											BYE	IBCF_A forwards BYE to IBCF_B
58B											BYE	IBCF_B forwards BYE to IMS_B
59B											BYE	IMS_B forwards BYE to AS/IM_B
60B											BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
61B											BYE	IMS_B forwards BYE to IBCF_B
62B											BYE	IBCF_B forwards BYE to IBCF_A
63B											BYE	IBCF_A forwards BYE to IMS_A
64B											BYE	IMS_A forwards BYE to UE_B
65B												User B is informed that file transfer session has ended
66B											200 OK	UE_B sends 200 OK for BYE
67B											200 OK	IMS_A forwards 200 OK response to IBCF_A
68B											200 OK	IBCF_A forwards 200 OK response to IBCF_B
69B											200 OK	IBCF_B forwards 200 OK response to IMS_B
70B											200 OK	IMS_B forwards 200 OK response to AS/IM_B
71B											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
72B											200 OK	IMS_B forwards 200 OK response to IBCF_B
73B											200 OK	IBCF_B forwards 200 OK response to IBCF_A
74B											200 OK	IBCF_A forwards 200 OK response to IMS_A
75B											200 OK	IMS_A forwards 200 OK response to AS/IM_A
76B											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
77B											200 OK	IMS_A forwards 200 OK response to UE_A
78B												User A is informed that file transfer session has ended



## 4.5.4.3 Cancel file transfer - initiator

## 4.5.4.3.1 Cancel file transfer - initiator - interworking

Interoperability Test Description		
<b>Identifier:</b>	TD_IMS_FILE_0011	
<b>Summary:</b>	An established file transfer session is cancelled by the initiator of the session.	
<b>Configuration:</b>	CF_INT_AS	
<b>SUT</b>	IMS_A	
<b>References</b>	<b>Test Purpose</b>	<b>Specification Reference</b>
	TP_IMS_5106_01	TS 124 229 [1], clause 5.4.3.2 ¶108 (6 <sup>th</sup> numbered list)
	TP_IMS_5121_02	TS 124 229 [1], clause 5.4.3.3 ¶123 (9 <sup>th</sup> numbered list)
	TP_IMS_5107_01	TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 8 <sup>th</sup> numbered list)
<b>Use Case ref.:</b>	UC_RCS_4_I	
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userFT according to table 1</li> <li>IMS_A is configured to contact AS_A (IM_A)</li> <li>UE_B is registered in IMS_B using userFT according to table 1</li> <li>IMS_B is configured to contact AS_B (IM_B)</li> <li>User A and B are subscribed to file transfer service</li> <li>UE_B automatically answer on file transfer invitation</li> <li>IMS_A within the trust domain of IMS_B</li> <li>IMS_A not configured for topology hiding</li> </ul>	
<b>Test Sequence:</b>	<b>Step</b>	
	1	User A starts file transfer invitation to User B
	2	User B automatically accepts file transfer invitation
	3	Verify that users can perform file transfer
	4	User A releases file transfer session before the file is transferred
	5	Verify that user B is informed about cancelled file transfer session
	6	Verify that file transfer has stopped
	7	User A ends the file transfer session
	8	Verify that user B is informed that file transfer session has been released
9	Verify that user A is informed that file transfer session has been released	
<b>Conformance Criteria:</b>	<b>Check</b>	
	<b>1</b>	TP_IMS_5106_01 in CFW step 49 (INVITE): ensure that { when { UE_A sends a subsequent INVITE to UE_B } then { IMS_B receives the subsequent INVITE containing a Record-Route_header indicating the S-CSCF_SIP_URI of IMS_A and containing a Route_header not indicating the S-CSCF_SIP_URI of IMS_A and containing a P-Charging-Vector_header not containing an access-network-charging-info_parameter } }
	<b>2</b>	TP_IMS_5121_02 (IMS_B) in CFW step 64 (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 a access-network-charging-info_parameter } }

Interoperability Test Description	
<b>3</b>	TP_IMS_5107_01 in CFW step 84 (BYE): <i>ensure that {</i> <i>when { UE_A sends BYE to UE_B }</i> <i>then { IMS_B receives the BYE</i> <i>no [(a-z)] [(a-z)]containing Route_header</i> <i>indicating the S-CSCF_SIP_URI of IMS_A }</i> <i>}</i>

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
39	←											Users are in file transfer session
40	→											User A ends the file transfer before file is transferred
41		→									INVITE (optional) See note	UE_A sends reINVITE with SDP offer and with port number set to zero within "m=" line
42		←									100 Trying (optional)	IMS_A responds with a 100 Trying provisional response
43		←									INVITE (optional)	IMS_A forwards reINVITE to AS/IM_A
44		→									100 Trying (optional)	AS/IM_A responds with a 100 Trying provisional response
45		→									INVITE (optional)	AS/IM_A returns, possibly modified, reINVITE to IMS_A
46		←									100 Trying (optional)	IMS_A responds with a 100 Trying provisional response
47		→									INVITE (optional)	IMS_A forwards reINVITE to IBCF_A
48		←									100 Trying (optional)	IBCF_A responds with a 100 Trying provisional response
49		→									INVITE (optional)	IBCF_A forwards reINVITE to IBCF_B
50		←									100 Trying (optional)	IBCF_B responds with a 100 Trying provisional response
51		→									INVITE (optional)	IBCF_B forwards reINVITE to IMS_B
52		←									100 Trying (optional)	IMS_B responds with a 100 Trying provisional response
53		→									INVITE (optional)	IMS_B forwards reINVITE to AS/IM_B
54		←									100 Trying (optional)	AS/IM_B responds with a 100 Trying provisional response
55		←									INVITE (optional)	AS/IM_B returns, possibly modified, reINVITE to IMS_B
56		→									100 Trying (optional)	IMS_B responds with a 100 Trying provisional response
57		→									INVITE (optional)	IMS_B forwards reINVITE to UE_B
58		←									100 Trying (optional)	UE_B optionally responds with a 100 Trying provisional response
59	→											User B is informed about cancelled file transfer
60		←									200 OK (optional)	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
61		→									200 OK (optional)	IMS_B forwards 200 OK response to AS/IM_B
62		←									200 OK (optional)	AS/IM_B returns, possibly modified, 200 OK response to IMS_B

Step	Direction										Message	Comment		
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B				
63												200 OK (optional)	IMS_B forwards 200 OK response to IBCF_B	
64												200 OK (optional)	IBCF_B forwards 200 OK response to IBCF_A	
65												200 OK (optional)	IBCF_A forwards 200 OK response to IMS_A	
66												200 OK (optional)	IMS_A forwards 200 OK response to AS/IM_A	
67												200 OK (optional)	AS/IM_A returns, possibly modified, 200 OK response to IMS_A	
68												200 OK (optional)	IMS_A forwards 200 OK response to UE_A	
69												ACK (optional)	UE_A acknowledges the receipt of 200 OK for INVITE	
70												ACK (optional)	IMS_A forwards ACK to AS/IM_A	
71												ACK (optional)	AS/IM_A returns, possibly modified, ACK to IMS_A	
72												ACK (optional)	IMS_A forwards ACK to IBCF_A	
73												ACK (optional)	IBCF_A forwards ACK to IBCF_B	
74												ACK (optional)	IBCF_B forwards ACK to IMS_B	
75												ACK (optional)	IMS_B forwards ACK to AS/IM_B	
76												ACK (optional)	AS/IM_B returns, possibly modified, ACK to IMS_B	
77												ACK (optional)	IMS_B forwards ACK to UE_B	
78													File transfer has stopped	
79													User A ends the file transfer session	
80													BYE	UE_A releases the file transfer session with BYE
81													BYE	IMS_A forwards BYE to AS/IM_A
82													BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
83													BYE	IMS_A forwards BYE to IBCF_A
84													BYE	IBCF_A forwards BYE to IBCF_B
85													BYE	IBCF_B forwards BYE to IMS_B
86													BYE	IMS_B forwards BYE to AS/IM_B
87													BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
88													BYE	IMS_B forwards BYE to UE_B
89													User B is informed that file transfer session has ended	
90													200 OK	UE_B sends 200 OK for BYE
91													200 OK	IMS_B forwards 200 OK response to AS/IM_B
92													200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
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

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
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_A
99	←											User A is informed that file transfer session has ended

NOTE: RFC 5547 [12], clause 8.4: Rather than close the MSRP session by setting the port number to zero in the related "m=" line, the file sender could also tear down the whole session, e.g. by sending a SIP BYE request.

## 4.5.4.3.2 Cancel file transfer - initiator - roaming

Interoperability Test Description		
<b>Identifier:</b>	TD_IMS_FILE_0012	
<b>Summary:</b>	An established file transfer session is cancelled by the roaming initiator of the session.	
<b>Configuration:</b>	CF_ROAM_AS	
<b>SUT</b>	IMS_A	
<b>References</b>	<b>Test Purpose</b>	<b>Specification Reference</b>
	TP_IMS_5048_01	TS 124 229 [1], clause 5.2.6.3.5 ¶1 (1 <sup>st</sup> numbered list)
	TP_IMS_5080_01	TS 124 229 [1], clause 5.2.9.1 ¶2
<b>Use Case ref.:</b>	UC_RCS_4_R	
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userFT according to table 1</li> <li>IMS_A is configured to contact AS_A (IM_A)</li> <li>UE_B is registered in IMS_B via IMS_A using userFT according to table 1</li> <li>IMS_B is configured to contact AS_B (IM_B)</li> <li>User A and B are subscribed to file transfer service</li> <li>UE_B automatically answer on file transfer invitation</li> <li>IMS_A within the trust domain of IMS_B</li> <li>IMS_A not configured for topology hiding</li> </ul>	
<b>Test Sequence:</b>	<b>Step</b>	
	1	User B starts file transfer invitation to User A
	2	User A automatically accepts file transfer invitation
	3	Verify that users can perform file transfer
	4	User B releases file transfer session before the file is transferred
	5	Verify that user A is informed about cancelled file transfer session
	6	Verify that file transfer has stopped
	7	User B ends the file transfer session
	8	Verify that User A is informed that file transfer session has been released
	9	Verify that User B is informed that file transfer session has been released
<b>Conformance Criteria:</b>	<b>Check</b>	
	1	TP_IMS_5048_01 in CFW step 57 (INVITE): <i>ensure that {  when { IMS_A receives a subsequent INVITE from UE_B }  then { IMS_A sends the INVITE to IMS_B  containing a topmost Route_header  not indicating the P-CSCF_SIP_URI of IMS_A 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 }  }</i>

Interoperability Test Description	
<b>2</b>	TP_IMS_5080_01 in CFW step 57 (INVITE): <i>ensure that {</i> <i>when { IMS_A receives subsequent INVITE from UE_B }</i> <i>then { IMS_A sends the INVITE to IMS_B</i> <i>containing a P-Charging-Vector_header</i> <i>containing an updated access-network-charging-info_parameter}</i> <i>}</i>

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
51	←											Users are in file transfer session
52	←											User B ends the file transfer before file is transferred
53											INVITE (optional)	UE_B sends reINVITE with SDP offer and with port number set to zero within "m=" line
54											100 Trying (optional)	IMS_A responds with a 100 Trying provisional response
55											INVITE (optional)	IMS_A forwards INVITE to IBCF_A
56											100 Trying (optional)	IBCF_A responds with a 100 Trying provisional response
57											INVITE (optional)	IBCF_A forwards INVITE to IBCF_B
58											100 Trying (optional)	IBCF_B responds with a 100 Trying provisional response
59											INVITE (optional)	IBCF_B forwards INVITE to IMS_B
60											100 Trying (optional)	IMS_B responds with a 100 Trying provisional response
61											INVITE (optional)	IMS_B forwards INVITE to AS/IM_B
62											100 Trying (optional)	AS/IM_B responds with a 100 Trying provisional response
63											INVITE (optional)	AS/IM_B returns, possibly modified, INVITE to IMS_B
64											100 Trying (optional)	IMS_B responds with a 100 Trying provisional response
65											INVITE (optional)	IMS_B forwards INVITE to IBCF_B
66											100 Trying (optional)	IBCF_B responds with a 100 Trying provisional response
67											INVITE (optional)	IBCF_B forwards INVITE to IBCF_A
68											100 Trying (optional)	IBCF_A responds with a 100 Trying provisional response
69											INVITE (optional)	IBCF_A forwards INVITE to IMS_A
70											100 Trying (optional)	IMS_A responds with a 100 Trying provisional response
71											INVITE (optional)	IMS_A forwards INVITE to AS/IM_A
72											100 Trying (optional)	AS/IM_A responds with a 100 Trying provisional response
73											INVITE (optional)	AS/IM_A returns, possibly modified, INVITE to IMS_A
74											100 Trying (optional)	IMS_A responds with a 100 Trying provisional response
75											INVITE (optional)	IMS_A forwards INVITE to UE_A

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
76											100 Trying (optional)	UE_A optionally responds with a 100 Trying provisional response
77												User A is informed about cancelled [(a-z)] [(a-z)]file transfer
78											200 OK (optional)	UE_A 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
79											200 OK (optional)	IMS_A forwards 200 OK response to AS/IM_A
80											200 OK (optional)	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
81											200 OK (optional)	IMS_A forwards 200 OK response to IBCF_A
82											200 OK (optional)	IBCF_A forwards 200 OK response to IBCF_B
83											200 OK (optional)	IBCF_B forwards 200 OK response to IMS_B
84											200 OK (optional)	IMS_B forwards 200 OK response to AS/IM_B
85											200 OK (optional)	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
86											200 OK (optional)	IMS_B forwards 200 OK response to IBCF_B
87											200 OK (optional)	IBCF_B forwards 200 OK response to IBCF_A
88											200 OK (optional)	IBCF_A forwards 200 OK response to IMS_A
89											200 OK (optional)	IMS_A forwards 200 OK response to UE_B
90											ACK (optional)	UE_B acknowledges the receipt of 200 OK for INVITE
91											ACK (optional)	IMS_A forwards ACK to IBCF_A
92											ACK (optional)	IBCF_A forwards ACK to IBCF_B
93											ACK (optional)	IBCF_B forwards ACK to IMS_B
94											ACK (optional)	IMS_B forwards ACK to AS/IM_B
95											ACK (optional)	AS/IM_B returns, possibly modified, ACK to IMS_B
96											ACK (optional)	IMS_B forwards ACK to IBCF_B
97											ACK (optional)	IBCF_B forwards ACK to IBCF_A
98											ACK (optional)	IBCF_A forwards ACK to IMS_A
99											ACK (optional)	IMS_A forwards ACK to AS/IM_A
100											ACK (optional)	AS/IM_A returns, possibly modified, ACK to IMS_A
101											ACK (optional)	IMS_A forwards ACK to UE_A
102												File transfer is stopped
103A												User B ends the file transfer session
104A											BYE	UE_B releases the enhanced messages session with BYE
105A											BYE	IMS_A forwards BYE to IBCF_A

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
106A											BYE	IBCF_A forwards BYE to IBCF_B
107A											BYE	IBCF_B forwards BYE to IMS_B
108A											BYE	IMS_B forwards BYE to AS/IM_B
109A											BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
110A											BYE	IMS_B forwards BYE to IBCF_B
111A											BYE	IBCF_B forwards BYE to IBCF_A
112A											BYE	IBCF_A forwards BYE to IMS_A
113A											BYE	IMS_A forwards BYE to AS/IM_A
114A											BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
115A											BYE	IMS_A forwards BYE to UE_A
116A												User A is informed that file transfer session has ended
117A											200 OK	UE_A sends 200 OK for BYE
118A											200 OK	IMS_A forwards 200 OK response to AS/IM_A
119A											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
120A											200 OK	IMS_A forwards 200 OK response to IBCF_A
121A											200 OK	IBCF_A forwards 200 OK response to IBCF_B
122A											200 OK	IBCF_B forwards 200 OK response to IMS_B
123A											200 OK	IMS_B forwards 200 OK response to AS/IM_B
124A											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
125A											200 OK	IMS_B forwards 200 OK response to IBCF_B
126A											200 OK	IBCF_B forwards 200 OK response to IBCF_A
127A											200 OK	IBCF_A forwards 200 OK response to IMS_A
128A											200 OK	IMS_A forwards 200 OK response to UE_B
129A												User B is informed that file transfer session has ended

NOTE: RFC 5547 [12], clause 8.4: Rather than close the MSRP session by setting the port number to zero in the related "m=" line, the file sender could also tear down the whole session, e.g. by sending a SIP BYE request.

#### 4.5.4.4 Cancel file transfer - destination

##### 4.5.4.4.1 Cancel file transfer - destination - interworking

Interoperability Test Description		
<b>Identifier:</b>	TD_IMS_FILE_0013	
<b>Summary:</b>	An established file transfer session is cancelled by the destination of the file transfer.	
<b>Configuration:</b>	CF_INT_AS	
<b>SUT</b>	IMS_A	
<b>References</b>	<b>Test Purpose</b>	<b>Specification Reference</b>
	TP_IMS_5310_01	TS 124 229 [1], clause 5.4.6.1.2 ¶1
	TP_IMS_5312_01	TS 124 229 [1], clause 5.4.6.1.3 ¶1
<b>Use Case ref.:</b>	UC_RCS_4_I	

<b>Interoperability Test Description</b>																							
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>• HSS of IMS_A and of IMS B is configured according to table 1</li> <li>• UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>• UE_A is registered in IMS_A using userFT according to table 1</li> <li>• IMS_A is configured to contact AS_A (IM_A)</li> <li>• UE_B is registered in IMS_B using userFT according to table 1</li> <li>• IMS_B is configured to contact AS_B (IM_B)</li> <li>• User A and B are subscribed to file transfer service</li> <li>• UE_B automatically answer on file transfer invitation</li> <li>• IMS_A within the trust domain of IMS_B</li> <li>• IMS_A not configured for topology hiding</li> </ul>																						
<b>Test Sequence:</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Step</th> <th></th> </tr> </thead> <tbody> <tr><td>1</td><td>User A starts file transfer invitation to User B</td></tr> <tr><td>2</td><td>User B automatically accepts file transfer invitation</td></tr> <tr><td>3</td><td>Verify that User A is informed that file transfer invitation has been started</td></tr> <tr><td>4</td><td>User A starts file transfer to User B</td></tr> <tr><td>5</td><td>User B accept file transfer from User A</td></tr> <tr><td>6</td><td>Verify that User A is informed that file transfer has been started</td></tr> <tr><td>7</td><td>Verify that User B is informed that file transfer is in progress</td></tr> <tr><td>8</td><td>User B release file transfer session before file is transferred</td></tr> <tr><td>9</td><td>Verify with UE_A that file transfer session has been released</td></tr> <tr><td>10</td><td>Verify with UE_B that file transfer session has been released</td></tr> </tbody> </table>	Step		1	User A starts file transfer invitation to User B	2	User B automatically accepts file transfer invitation	3	Verify that User A is informed that file transfer invitation has been started	4	User A starts file transfer to User B	5	User B accept file transfer from User A	6	Verify that User A is informed that file transfer has been started	7	Verify that User B is informed that file transfer is in progress	8	User B release file transfer session before file is transferred	9	Verify with UE_A that file transfer session has been released	10	Verify with UE_B that file transfer session has been released
Step																							
1	User A starts file transfer invitation to User B																						
2	User B automatically accepts file transfer invitation																						
3	Verify that User A is informed that file transfer invitation has been started																						
4	User A starts file transfer to User B																						
5	User B accept file transfer from User A																						
6	Verify that User A is informed that file transfer has been started																						
7	Verify that User B is informed that file transfer is in progress																						
8	User B release file transfer session before file is transferred																						
9	Verify with UE_A that file transfer session has been released																						
10	Verify with UE_B that file transfer session has been released																						
<b>Conformance Criteria:</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Check</th> <th></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><b>1</b></td> <td>                     TP_IMS_5310_01 in CFW step 49 (INVITE)  <i>ensure that {</i>  <i>  when { UE_B sends a subsequent INVITE to IMS_B</i>  <i>          containing a P-Charging-Vector_header</i>  <i>          containing an access-network-charging-info_parameter</i>  <i>          }</i>  <i>  then { IMS_B sends the INVITE to AS_B</i>  <i>          containing a P-Charging-Vector_header</i>  <i>          containing an access-network-charging-info_parameter</i>  <i>          }</i>  <i>  }</i>  <i>}</i> </td> </tr> <tr> <td style="text-align: center;"><b>2</b></td> <td>                     TP_IMS_5312_01 in CFW step 64 (200 OK)  <i>ensure that {</i>  <i>  when { IMS_B receives a 200_response from IMS_A</i>  <i>          containing a P-Charging-Vector_header</i>  <i>          containing an access-network-charging-info_parameter</i>  <i>          }</i>  <i>  then { IMS_B sends the 200_response to AS_B</i>  <i>          containing a P-Charging-Vector_header</i>  <i>          containing a access-network-charging-info_parameter</i>  <i>          }</i>  <i>  }</i>  <i>}</i> </td> </tr> </tbody> </table>	Check		<b>1</b>	TP_IMS_5310_01 in CFW step 49 (INVITE) <i>ensure that {</i> <i>  when { UE_B sends a subsequent INVITE to IMS_B</i> <i>          containing a P-Charging-Vector_header</i> <i>          containing an access-network-charging-info_parameter</i> <i>          }</i> <i>  then { IMS_B sends the INVITE to AS_B</i> <i>          containing a P-Charging-Vector_header</i> <i>          containing an access-network-charging-info_parameter</i> <i>          }</i> <i>  }</i> <i>}</i>	<b>2</b>	TP_IMS_5312_01 in CFW step 64 (200 OK) <i>ensure that {</i> <i>  when { IMS_B receives a 200_response from IMS_A</i> <i>          containing a P-Charging-Vector_header</i> <i>          containing an access-network-charging-info_parameter</i> <i>          }</i> <i>  then { IMS_B sends the 200_response to AS_B</i> <i>          containing a P-Charging-Vector_header</i> <i>          containing a access-network-charging-info_parameter</i> <i>          }</i> <i>  }</i> <i>}</i>																
Check																							
<b>1</b>	TP_IMS_5310_01 in CFW step 49 (INVITE) <i>ensure that {</i> <i>  when { UE_B sends a subsequent INVITE to IMS_B</i> <i>          containing a P-Charging-Vector_header</i> <i>          containing an access-network-charging-info_parameter</i> <i>          }</i> <i>  then { IMS_B sends the INVITE to AS_B</i> <i>          containing a P-Charging-Vector_header</i> <i>          containing an access-network-charging-info_parameter</i> <i>          }</i> <i>  }</i> <i>}</i>																						
<b>2</b>	TP_IMS_5312_01 in CFW step 64 (200 OK) <i>ensure that {</i> <i>  when { IMS_B receives a 200_response from IMS_A</i> <i>          containing a P-Charging-Vector_header</i> <i>          containing an access-network-charging-info_parameter</i> <i>          }</i> <i>  then { IMS_B sends the 200_response to AS_B</i> <i>          containing a P-Charging-Vector_header</i> <i>          containing a access-network-charging-info_parameter</i> <i>          }</i> <i>  }</i> <i>}</i>																						

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
39	←-----→											Users are in file transfer session
40	←-----→											User B ends the file transfer before file is transferred
41											INVITE	UE_B sends reINVITE with SDP offer and with port number set to zero within "m=" line
42											100 Trying	IMS_B responds with a 100 Trying provisional response
43											INVITE	IMS_B forwards INVITE to AS/IM_B



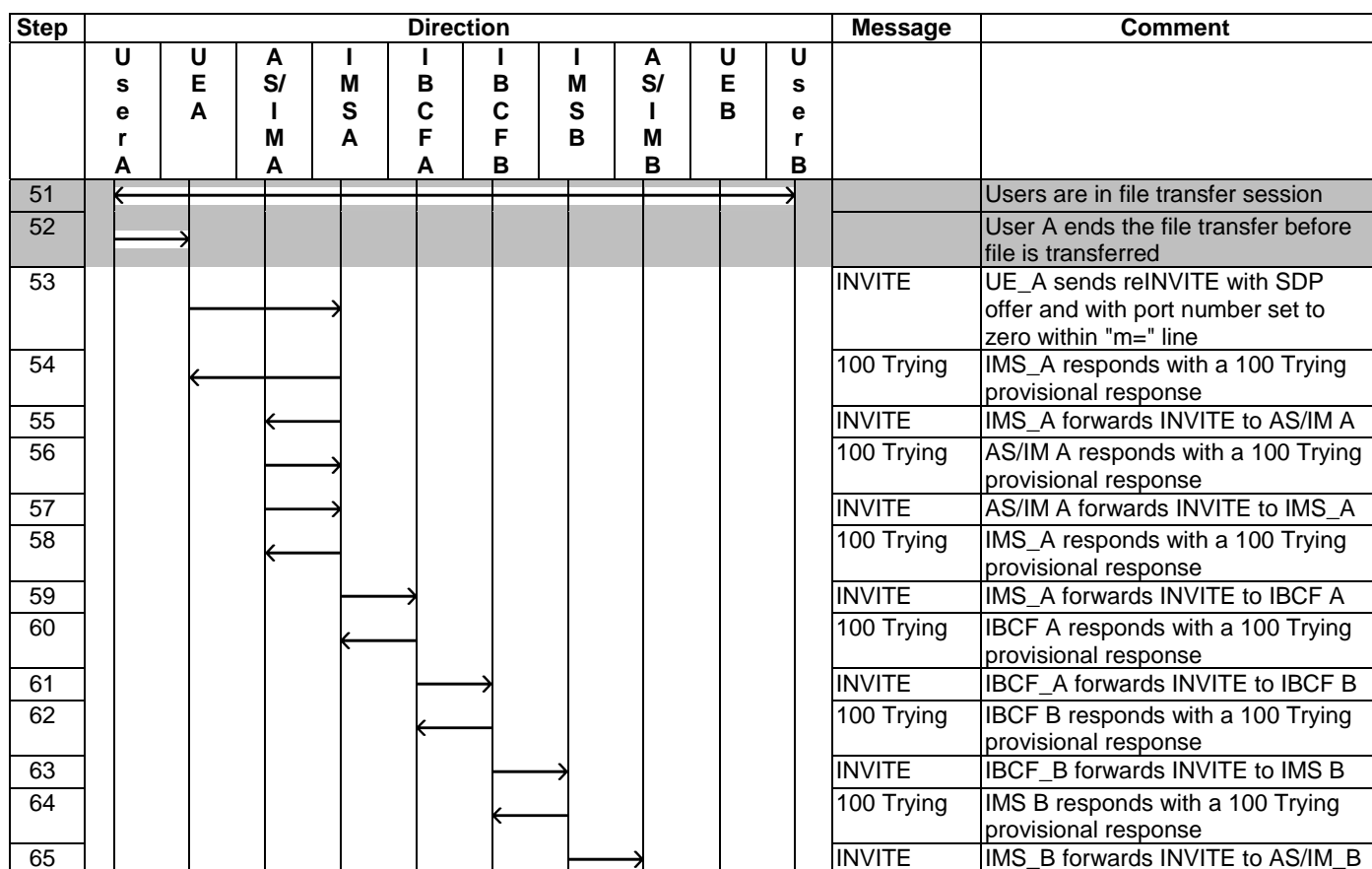
Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
44											100 Trying	AS/IM_B responds with a 100 Trying provisional response
45											INVITE	AS/IM_B forwards INVITE to IMS_B
46											100 Trying	IMS_B responds with a 100 Trying provisional response
47											INVITE	IMS_B forwards INVITE to IBCF_B
48											100 Trying	IBCF_B responds with a 100 Trying provisional response
49											INVITE	IBCF_B forwards INVITE to IBCF_A
50											100 Trying	IBCF_A responds with a 100 Trying provisional response
51											INVITE	IBCF_A returns, possibly modified, INVITE to IMS_A
52											100 Trying	IMS_A responds with a 100 Trying provisional response
53											INVITE	IMS_A forwards INVITE to AS/IMA
54											100 Trying	IBCF_A responds with a 100 Trying provisional response
55											INVITE	AS/IMA forwards INVITE to IMS_A
56											100 Trying	IMS_A responds with a 100 Trying provisional response
57											INVITE	IMS_A forwards INVITE to UE_A
58											100 Trying	UE_A responds with a 100 Trying provisional response
59												User A is informed about cancelled [(a-z)] [(a-z)]file transfer
60											200 OK	UE_A responds INVITE with 200 OK response
61											200 OK	IMS_A forwards 200 OK response to AS/IM_A
62											200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
63											200 OK	IMS_A forwards 200 OK response to IBCF_A
64											200 OK	IBCF_A forwards 200 OK response to IBCF_B
65											200 OK	IBCF_B forwards 200 OK response to IMS_B
66											200 OK	IMS_B forwards 200 OK response to AS/IM_B
67											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
68											200 OK	IMS_B forwards 200 OK response to UE_B
69											ACK	UE_B acknowledges the receipt of 200 OK for INVITE
70											ACK	IMS_B forwards ACK to AS/IM_B
71											ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
72											ACK	IMS_B forwards ACK to IBCF_B
73											ACK	IBCF_B forwards ACK to IBCF_A
74											<b>ACK</b>	<b>IBCF_A forwards ACK to IMS_A</b>
75											ACK	IMS_A forwards ACK to AS/IM_A
76											ACK	AS/IM_A returns, possibly modified, ACK to IMS_A
77											ACK	IMS_A forwards ACK to UE_A
78												File transfer is stopped
79												User A ends the file transfer session

Step	Direction										Message	Comment
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B		
80											BYE	UE_A releases the enhanced messages session with BYE
81											BYE	IMS_A forwards BYE to AS/IM_A
82											BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
83											BYE	IMS_A forwards BYE to IBCF_A
84											BYE	IBCF_A forwards BYE to IBCF_B
85											BYE	IBCF_B forwards BYE to IMS_B
86											BYE	IMS_B forwards BYE to AS/IM_B
87											BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
88											BYE	IMS_B forwards BYE to UE_B
89												User B is informed that enhanced messages session has ended
90											200 OK	UE_B sends 200 OK for BYE
91											200 OK	IMS_B forwards 200 OK response to AS/IM_B
92											200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
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_A
99												User A is informed that file transfer session has ended

## 4.5.4.4.2 Cancel file transfer - destination - roaming

Interoperability Test Description							
<b>Identifier:</b>	TD_IMS_FILE_0014						
<b>Summary:</b>	An established file transfer session is cancelled by the destination of the file transfer.						
<b>Configuration:</b>	CF_ROAM_AS						
<b>SUT</b>	IMS_A						
<b>References</b>	<table border="1"> <thead> <tr> <th>Test Purpose</th> <th>Specification Reference</th> </tr> </thead> <tbody> <tr> <td>TP_IMS_5048_01</td> <td>TS 124 229 [1], clause 5.2.6.3.5 ¶1 (1<sup>st</sup> numbered list)</td> </tr> <tr> <td>TP_IMS_5080_01</td> <td>TS 124 229 [1], clause 5.2.9.1 ¶2</td> </tr> </tbody> </table>	Test Purpose	Specification Reference	TP_IMS_5048_01	TS 124 229 [1], clause 5.2.6.3.5 ¶1 (1 <sup>st</sup> numbered list)	TP_IMS_5080_01	TS 124 229 [1], clause 5.2.9.1 ¶2
Test Purpose	Specification Reference						
TP_IMS_5048_01	TS 124 229 [1], clause 5.2.6.3.5 ¶1 (1 <sup>st</sup> numbered list)						
TP_IMS_5080_01	TS 124 229 [1], clause 5.2.9.1 ¶2						
<b>Use Case ref.:</b>	UC_RCS_4_R						
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userFT according to table 1</li> <li>IMS_A is configured to contact AS_A (IM_A)</li> <li>UE_B is registered in IMS_B via IMS_A using userFT according to table 1</li> <li>IMS_B is configured to contact AS_B (IM_B)</li> <li>User A and B are subscribed to file transfer service</li> <li>UE_B automatically answer on file transfer invitation</li> <li>IMS_A within the trust domain of IMS_B</li> </ul>						

Interoperability Test Description		
<ul style="list-style-type: none"> <li>IMS_A not configured for topology hiding</li> </ul>		
Test Sequence:	Step	
	1	User B starts file transfer invitation to User A
	2	User A automatically accepts file transfer invitation
	3	Verify that User B is informed that file transfer invitation has been started
	4	User B starts file transfer to User A
	5	User A accept file transfer from User B
	6	Verify that User B is informed that file transfer has been started
	7	Verify that User A is informed that file transfer is in progress
	8	User A release file transfer session before file is transferred
	9	Verify with UE_B that file transfer session has been released
10	Verify with UE_A that file transfer session has been released	
Conformance Criteria:	Check	
	1	TP_IMS_5048_01 in CFW step 61 (INVITE): ensure that { when { IMS_A receives a subsequent INVITE from UE_B } then { IMS_A sends the INVITE to IMS_B containing a topmost Route_header not indicating the P-CSCF_SIP_URI of IMS_A 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 } }
2	TP_IMS_5080_01 in CFW step 61 (INVITE): ensure that { when { IMS_A receives subsequent INVITE from UE_B } then { IMS_A sends the INVITE to IMS_B containing a P-Charging-Vector_header containing an updated access-network-charging-info_parameter} }	



Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
66											←	100 Trying	AS/IM_B responds with a 100 Trying provisional response
67											←	INVITE	AS/IM_B returns, possibly modified, INVITE to IMS_B
68											→	100 Trying	IMS_B responds with a 100 Trying provisional response
69											←	INVITE	IMS_B forwards INVITE to IBCF_B
70											→	100 Trying	IBCF_B responds with a 100 Trying provisional response
71											←	INVITE	IBCF_B forwards INVITE to IBCF_A
72											→	100 Trying	IBCF_A responds with a 100 Trying provisional response
73											←	INVITE	IBCF_A forwards INVITE to IMS_A
74											→	100 Trying	IMS_A responds with a 100 Trying provisional response
75											→	INVITE	IMS_A forwards INVITE to UE B
76											←	100 Trying	UE_B responds with a 100 Trying provisional response
77											⇒		User B is informed about cancelled [(a-z)] [(a-z)]enhanced messaging session
78											←	200 OK	UE_A responds INVITE with 200 OK response with SDP to indicate that the session has been accepted
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
82											→	200 OK	IMS_B forwards 200 OK response to AS/IM_B
83											←	200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
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 AS/IM_A
88											→	200 OK	AS/IM_A forwards 200 OK response to IMS_A
89											←	200 OK	IMS_A forwards 200 OK response to UE_A
90											→	ACK	UE_A forwards ACK to IMS_A
91											←	ACK	IMS_A forwards ACK to AS/IM_A
92											→	ACK	AS/IM_A acknowledges the receipt of 200 OK for INVITE
93											→	ACK	IMS_A forwards ACK to IBCF_A
94											→	ACK	IBCF_A forwards ACK to IBCF_B
95											→	ACK	IBCF_B forwards ACK to IMS_B
96											→	ACK	IMS_B forwards ACK to AS/IM_B

Step	Direction										Message	Comment	
	U s e r A	U E A	A S/ I M A	I M S A	I B C F A	I B C F B	I M S B	A S/ I M B	U E B	U s e r B			
97												ACK	AS/IM_B returns, possibly modified, ACK to IMS_B
98												ACK	IMS_B forwards ACK to IBCF_B
99												ACK	IBCF_B forwards ACK to IBCF_A
100												ACK	IBCF_A forwards ACK to IMS_A
101												ACK	IMS_A forwards ACK to UE B
102													File transfer is stopped
103A													User B ends the file transfer session
104A												BYE	UE_B releases the enhanced messages session with BYE
105A												BYE	IMS_A forwards BYE to IBCF_A
106A												BYE	IBCF_A forwards BYE to IBCF_B
107A												BYE	IBCF_B forwards BYE to IMS_B
108A												BYE	IMS_B forwards BYE to AS/IM_B
109A												BYE	AS/IM_B returns, possibly modified, BYE to IMS_B
110A												BYE	IMS_B forwards BYE to IBCF_B
111A												BYE	IBCF_B forwards BYE to IBCF_A
112A												BYE	IBCF_A forwards BYE to IMS_A
113A												BYE	IMS_A forwards BYE to AS/IM_A
114A												BYE	AS/IM_A returns, possibly modified, BYE to IMS_A
115A												BYE	IMS_A forwards BYE to UE_A
116A													User A is informed that file transfer session has ended
117A												200 OK	UE_A sends 200 OK for BYE
118A												200 OK	IMS_A forwards 200 OK response to AS/IM_A
119A												200 OK	AS/IM_A returns, possibly modified, 200 OK response to IMS_A
120A												200 OK	IMS_A forwards 200 OK response to IBCF_A
121A												200 OK	IBCF_A forwards 200 OK response to IBCF_B
122A												200 OK	IBCF_B forwards 200 OK response to IMS_B
123A												200 OK	IMS_B forwards 200 OK response to AS/IM_B
124A												200 OK	AS/IM_B returns, possibly modified, 200 OK response to IMS_B
125A												200 OK	IMS_B forwards 200 OK response to IBCF_B
126A												200 OK	IBCF_B forwards 200 OK response to IBCF_A
127A												200 OK	IBCF_A forwards 200 OK response to IMS_A
128A												200 OK	IMS_A forwards 200 OK response to UE_B
129A													User B is informed that file transfer session has ended

## 4.5.5 Content Sharing

Shared content in the following clauses should be images or videos.

### 4.5.5.1 Content Sharing from calling to called user

#### 4.5.5.1.1 Content Sharing from calling to called user - interworking

Interoperability Test Description		
<b>Identifier:</b>	TD_IMS_SHARE_0001	
<b>Summary:</b>	User A sets up a voice call to user B and shares content with user B.	
<b>Configuration:</b>	CF_INT_CALL	
<b>SUT</b>	IMS_A and IMS_B and UE_B	
<b>References</b>	<b>Test Purpose</b>	<b>Specification Reference</b>
	TP_IMS_CONTENT_SHARING_01	Rich Communication Suite Release 2, Technical realization [10], clause 8.1
	TP_IMS_CONTENT_SHARING_02	Rich Communication Suite Release 2, Technical realization [10], clause 8.1
<b>Use Case ref.:</b>	UC_RCS_11_I	
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>• HSS of IMS_A and of IMS B is configured according to table 1</li> <li>• UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>• UE_A is registered in IMS_A using userSHARE according to table 1</li> <li>• UE_B is registered in IMS_B using userSHARE according to table 1</li> <li>• User A and B are subscribed to file transfer service</li> <li>• IMS_A within the trust domain of IMS_B</li> <li>• UE_A and UE_B support content sharing</li> </ul>	
<b>Test Sequence:</b>	<b>Step</b>	
	1	Setup of voice call between User A and user B
	2	Verify that user A is informed of content sharing capabilities of user B
	3	Verify that user B is informed on content sharing capabilities of user A
	4	User A requests to share content with user B
	5	User B is requested to accept to share content
	6	User B accepts to share content with User A
	7	Verify that user A is informed that request has been answered
	8	User A ends content sharing
	9	Verify that user B is informed that content sharing terminates
	10	Content sharing terminates
11	User A ends voice call	
<b>Conformance Criteria:</b>	<b>Check</b>	
	1	TP_IMS_CONTENT_SHARE_01 in CFW step 4 (OPTIONS): ensure that { when { IUT receives an OPTIONS from UE_A addressed_to UE_B } then { IUT sends the OPTIONS to IMS_B containing a Contact_header indicating g.3gpp.cs-voice_feature_tag and containing a Accept-Contact_header indicating g.3gpp.cs-voice_feature_tag } }
	2	TP_IMS_CONTENT_SHARE_02 in CFW step 29 (INVITE): ensure that { when { IUT receives a subsequent content_share INVITE from UE_A addressed_to UE_B } then { IUT sends the INVITE to IMS_B containing a Contact_header indicating g.3gpp.cs-voice_feature_tag and containing a Accept-Contact_header indicating g.3gpp.cs-voice_feature_tag } }

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
2									OPTIONS	UE_A sends OPTIONS to IMS_A
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									200 OK	UE_B responds with 200 OK to IMS_B
8									200 OK	IMS_B forwards 200 OK to IBCF_B
9									200 OK	IBCF_B forwards 200 OK to IBCF_A
10									200 OK	IBCF_A forwards 200 OK to IMS_A
11									200 OK	IMS_A forwards 200 OK to UE_A
12										User A is informed on content sharing capabilities of user B
13									OPTIONS	UE_B sends OPTIONS to IMS_B
14									OPTIONS	IMS_B forwards OPTIONS to IBCF_B
15									OPTIONS	IBCF_B forwards OPTIONS to IBCF_A
16									OPTIONS	IBCF_A forwards OPTIONS to IMS_A
17									OPTIONS	IMS_A forwards OPTIONS to UE_A
18									200 OK	UE_A responds 200 OK to IMS_A
19									200 OK	IMS_A forwards 200 OK to IBCF_A
20									200 OK	IBCF_A forwards 200 OK to IBCF_B
21									200 OK	IBCF_B forwards 200 OK to IMS_B
22									200 OK	IMS_B forwards 200 OK to UE_B
23										User B is informed of content sharing capabilities of user A
24										User A requests to share content with user B
25									INVITE	UE_A sends INVITE to share content with user B
26									100 Trying	IMS_A responds with a 100 Trying provisional response
27									INVITE	IMS_A forwards INVITE to IBCF_A
28									100 Trying	IBCF_A responds with a 100 Trying provisional response
29									INVITE	IBCF_A forwards INVITE to IBCF_B
30									100 Trying	IBCF_B responds with a 100 Trying provisional response
31									INVITE	IBCF_B forwards INVITE to IMS_B
32									100 Trying	IMS_B responds with a 100 Trying provisional response
33									INVITE	IMS_B forwards INVITE to UE_B
34									100 Trying	UE_B responds with a 100 Trying provisional response
35										User B is requested to accept to share content
36									180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting
37									180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
38									180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
39									180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
40									180 Ringing	IMS_A forwards the 180 Ringing response to UE_A
41										User B accepts to share content
42									200 OK	UE_B responds INVITE with 200 OK to indicate that the request has been accepted

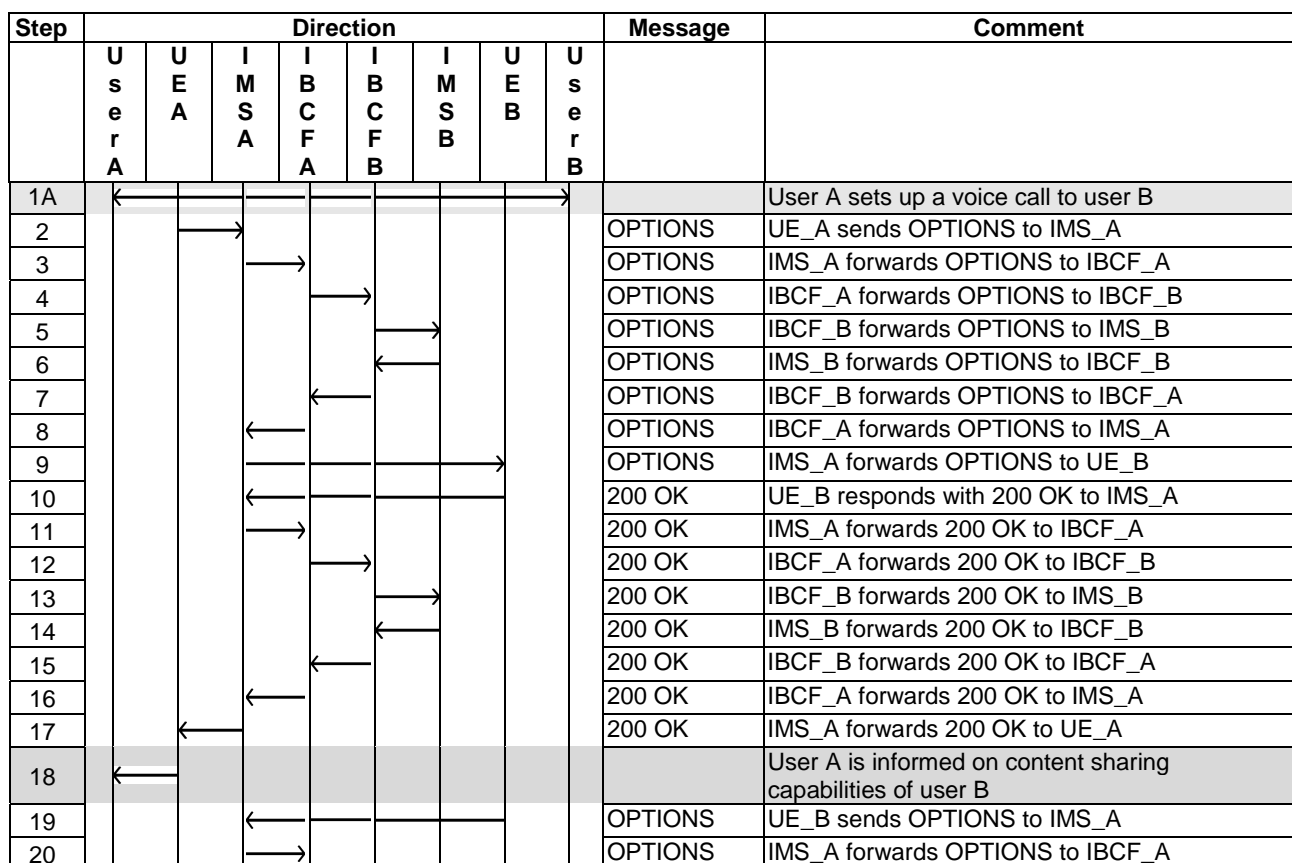
Step	Direction									Message	Comment
	U s e r A	U E A	I M S A	I B C F A	I B C F B	I M S B	U E B	U s e r B			
43										200 OK	IMS_B forwards 200 OK response to IBCF_B
44										200 OK	IBCF_B forwards 200 OK response to IBCF_A
45										200 OK	IBCF_A forwards 200 OK response to IMS_A
46										200 OK	IMS_A forwards 200 OK response to UE_A
47											User A is informed that request has been answered
48										ACK	UE_A acknowledges the receipt of 200 OK for INVITE
49										ACK	IMS_A forwards ACK to IBCF_A
50										ACK	IBCF_A forwards ACK to IBCF_B
51										ACK	IBCF_B forwards ACK to IMS_B
52										ACK	IMS_B forwards ACK to UE_B
53											Content sharing starts
54A											User A ends content sharing
55A										BYE	UE_A releases the call with BYE
56A										BYE	IMS_A forwards BYE to IBCF_A
57A										BYE	IBCF_A forwards BYE to IBCF_B
58A										BYE	IBCF_B forwards BYE to IMS_B
59A										BYE	IMS_B forwards BYE to UE_B
60A											User B is informed that content sharing has ended
61A										200 OK	UE_B sends 200 OK for BYE
62A										200 OK	IMS_B forwards 200 OK response to IBCF_B
63A										200 OK	IBCF_B forwards 200 OK response to IBCF_A
64A										200 OK	IBCF_A forwards 200 OK response to IMS_A
65A										200 OK	IMS_A forwards the 200 OK response to UE_A
66A											User A is informed that content sharing has ended
67A											Voice call termination initiated by user A

#### 4.5.5.1.2 Content Sharing from calling to called user - roaming

Interoperability Test Description	
<b>Identifier:</b>	TD_IMS_SHARE_0002
<b>Summary:</b>	User A sets up a voice call to user B and shares content with user B.
<b>Configuration:</b>	CF_ROAM_CALL
<b>SUT</b>	IMS_A and IMS_B and UE_B
<b>References</b>	<b>Test Purpose</b>
	<b>Specification Reference</b>
	TP_IMS_CONTENT_SHARING_01
	Rich Communication Suite Release 2, Technical realization [10], clause 8.1
	TP_IMS_CONTENT_SHARING_02
	Rich Communication Suite Release 2, Technical realization [10], clause 8.1
<b>Use Case ref.:</b>	UC_RCS_11_R
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS_B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userSHARE according to table 1</li> <li>UE_B is registered in IMS_B via IMS_A using userSHARE according to table 1</li> <li>User A and B are subscribed to file transfer service</li> <li>IMS_A within the trust domain of IMS_B</li> <li>UE_A and UE_B support content sharing</li> </ul>



Interoperability Test Description		
<b>Test Sequence:</b>	<b>Step</b>	
	1	Setup of voice call between User A and user B
	2	Verify that user A is informed of content sharing capabilities of user B
	3	Verify that user B is informed on content sharing capabilities of user A
	4	User A requests to share content with user B
	5	User B is requested to accept to share content
	6	User B accepts to share content with User A
	7	Verify that user A is informed that request has been answered
	8	User A ends content sharing
	9	Verify that user B is informed that content sharing terminates
	10	Content sharing terminates
11	User A ends voice call	
<b>Conformance Criteria:</b>	<b>Check</b>	
	1	TP_IMS_CONTENT_SHARE_01 in CFW step 4 (OPTIONS): ensure that { when { IUT receives an OPTIONS from UE_A addressed_to UE_B } then { IUT sends the OPTIONS to IMS_B containing a Contact_header indicating g.3gpp.cs-voice_feature_tag and containing a Accept-Contact_header indicating g.3gpp.cs-voice_feature_tag } }
	2	TP_IMS_CONTENT_SHARE_02 in CFW step 41 (INVITE): ensure that { when { IUT receives a subsequent content_share INVITE from UE_A addressed_to UE_B } then { IUT sends the INVITE to IMS_B containing a Contact_header indicating g.3gpp.cs-voice_feature_tag and containing a Accept-Contact_header indicating g.3gpp.cs-voice_feature_tag } }



Step	Direction								Message	Comment
	User A	UE A	IMS A	IBCF A	IBCF B	IMS B	UE B	User B		
21					→				OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
22						→			OPTIONS	IBCF_B forwards OPTIONS to IMS_B
23						←			OPTIONS	IMS_B forwards OPTIONS to IBCF_B
24					←				OPTIONS	IBCF_B forwards OPTIONS to IBCF_A
25			←						OPTIONS	IBCF_A forwards OPTIONS to IMS_A
26		←							OPTIONS	IMS_A forwards OPTIONS to UE_A
27		→							200 OK	UE_A responds 200 OK to IMS_A
28			→						200 OK	IMS_A forwards 200 OK to IBCF_A
29				→					200 OK	IBCF_A forwards 200 OK to IBCF_B
30					→				200 OK	IBCF_B forwards 200 OK to IMS_B
31					←				200 OK	IMS_B forwards 200 OK to IBCF_B
32				←					200 OK	IBCF_B forwards 200 OK to IBCF_A
33			←						200 OK	IBCF_A forwards 200 OK to IMS_A
34							→		200 OK	IMS_A forwards 200 OK to UE_B
35								→		User B is informed of content sharing capabilities of user A
36	→									User A requests to share content with user B
37		→							INVITE	UE_A sends INVITE to share content with user B
38		←							100 Trying	IMS_A responds with a 100 Trying provisional response
39			→						INVITE	IMS_A forwards INVITE to IBCF_A
40			←						100 Trying	IBCF_A responds with a 100 Trying provisional response
41				→					INVITE	IBCF_A forwards INVITE to IBCF_B
42				←					100 Trying	IBCF_B responds with a 100 Trying provisional response
43					→				INVITE	IBCF_B forwards INVITE to IMS_B
44					←				100 Trying	IMS_B responds with a 100 Trying provisional response
45					←				INVITE	IMS_B forwards INVITE to IBCF_B
46					←				100 Trying	IBCF_B responds with a 100 Trying provisional response
47				←					INVITE	IBCF_B forwards INVITE to IBCF_A
48				→					100 Trying	IBCF_A responds with a 100 Trying provisional response
49			←						INVITE	IBCF_A forwards INVITE to IMS_A
50		→							100 Trying	IMS_A responds with a 100 Trying provisional response
51							→		INVITE	IMS_A forwards INVITE to UE_B
52							←		100 Trying	UE_B responds with a 100 Trying provisional response
53								→		User B is requested to accept to share content
54				←					180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting
55			→						180 Ringing	IMS_A forwards 180 Ringing response to IBCF_A
56				→					180 Ringing	IBCF_A forwards 180 Ringing response to IBCF_B
57					→				180 Ringing	IBCF_B forwards 180 Ringing response to IMS_B
58					←				180 Ringing	IMS_B forwards the 180 Ringing response to IBCF_B
59				←					180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
60			←						180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A

Step	Direction									Message	Comment
	U s e r A	U E A	I M S A	I B C F A	I B C F B	I M S B	U E B	U s e r B			
61			←							180 Ringing	IMS_A forwards 180 Ringing response to UE_A
62									←		User B accepts to share content
63			←							200 OK	UE_B responds INVITE with 200 OK to indicate that the request has been accepted
64				→						200 OK	IMS_A forwards 200 OK response to IBCF_A
65					→					200 OK	IBCF_A forwards 200 OK response to IBCF_B
66						→				200 OK	IBCF_B forwards 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											IMS_A forwards 200 OK response to UE_A
71	←										User A is informed that request has been answered
72		→								ACK	UE_A acknowledges the receipt of 200 OK for INVITE
73			→							ACK	IMS_A forwards ACK to IBCF_A
74				→						ACK	IBCF_A forwards ACK to IBCF_B
75					→					ACK	IBCF_B forwards ACK to IMS_B
76						←				ACK	IMS_B forwards ACK to IBCF_B
77				←						ACK	IBCF_B forwards ACK to IBCF_A
78			←							ACK	IBCF_A forwards ACK to IMS_A
79								→		ACK	IMS_A forwards ACK to UE_B
80											Content sharing starts
81A	←										User A ends content sharing
82A		→								BYE	UE_A releases the call with BYE
83A			→							BYE	IMS_A forwards BYE to IBCF_A
84A				→						BYE	IBCF_A forwards BYE to IBCF_B
85A					→					BYE	IBCF_B forwards BYE to IMS_B
86A						←				BYE	IMS_B forwards BYE to IBCF_B
87A				←						BYE	IBCF_B forwards BYE to IBCF_A
88A			←							BYE	IBCF_A forwards BYE to IMS_A
89A								→		BYE	IMS_A forwards BYE to UE_B
90A								→			User B is informed that content sharing has ended
91A			←							200 OK	UE_B sends 200 OK for BYE
92A				→						200 OK	IMS_A forwards 200 OK response to IBCF_A
93A				→						200 OK	IBCF_A forwards 200 OK response to IBCF_B
94A					→					200 OK	IBCF_B forwards 200 OK response to IMS_B
95A						←				200 OK	IMS_B forwards the 200 OK response to IBCF_B
96A				←						200 OK	IBCF_B forwards 200 OK response to IBCF_A
97A			←							200 OK	IBCF_A forwards 200 OK response to IMS_A
98A			←							200 OK	IMS_A forwards the 200 OK response to UE_A
99A											Content sharing terminates
100A											User A terminates voice call

## 4.5.5.2 Termination of Voice Call

## 4.5.5.2.1 Termination of Voice Call - interworking

Interoperability Test Description		
<b>Identifier:</b>	TD_IMS_SHARE_0003	
<b>Summary:</b>	Termination of voice call during content sharing	
<b>Configuration:</b>	CF_INT_CALL	
<b>SUT</b>	IMS_A and IMS_B and UE_B	
<b>References</b>	<b>Test Purpose</b>	<b>Specification Reference</b>
	TP_IMS_CONTENT_SHARING_01	Rich Communication Suite Release 2, Technical realization [10], clause 8.1
	TP_IMS_CONTENT_SHARING_02	Rich Communication Suite Release 2, Technical realization [10], clause 8.1
<b>Use Case ref.:</b>	UC_RCS_11_I	
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>• HSS of IMS_A and of IMS_B is configured according to table 1</li> <li>• UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>• UE_A is registered in IMS_A using userSHARE according to table 1</li> <li>• UE_B is registered in IMS_B using userSHARE according to table 1</li> <li>• User A and B are subscribed to file transfer service</li> <li>• IMS_A within the trust domain of IMS_B</li> <li>• UE_A and UE_B support content sharing</li> </ul>	
<b>Test Sequence:</b>	<b>Step</b>	
	1	Setup of voice call between User A and user B
	2	Verify that user A is informed of content sharing capabilities of user B
	3	Verify that user B is informed on content sharing capabilities of user A
	4	User A requests to share content with user B
	5	User B is requested to accept to share content
	6	User B accepts to share content with User A
	7	Verify that user A is informed that request has been answered
	8	User A ends voice call
	9	Verify that user B is informed that content sharing terminates
	10	Content sharing terminates
<b>Conformance Criteria:</b>	<b>Check</b>	
	1	TP_IMS_CONTENT_SHARE_01 in CFW step 4 (OPTIONS): ensure that { when { IUT receives an OPTIONS from UE_A addressed_to UE_B } then { IUT sends the OPTIONS to IMS_B containing a Contact_header indicating g.3gpp.cs-voice_feature_tag and containing a Accept-Contact_header indicating g.3gpp.cs-voice_feature_tag } }
	2	TP_IMS_CONTENT_SHARE_02 in CFW step 29 (INVITE): ensure that { when { IUT receives a subsequent content_share INVITE from UE_A addressed_to UE_B } then { IUT sends the INVITE to IMS_B containing a Contact_header indicating g.3gpp.cs-voice_feature_tag and containing a Accept-Contact_header indicating g.3gpp.cs-voice_feature_tag } }

Step	Direction									Message	Comment
	U s e r A	U E A	I M S A	I B C F A	I B C F B	I M S B	U E B	U s e r B			
1											User A sets up a voice call to user B
2										OPTIONS	UE_A sends OPTIONS to IMS_A
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										200 OK	UE_B responds with 200 OK to IMS_B
8										200 OK	IMS_B forwards 200 OK to IBCF_B
9										200 OK	IBCF_B forwards 200 OK to IBCF_A
10										200 OK	IBCF_A forwards 200 OK to IMS_A
11										200 OK	IMS_A forwards 200 OK to UE_A
12											User A is informed on content sharing capabilities of user B
13										OPTIONS	UE_B sends OPTIONS to IMS_B
14										OPTIONS	IMS_B forwards OPTIONS to IBCF_B
15										OPTIONS	IBCF_B forwards OPTIONS to IBCF_A
16										OPTIONS	IBCF_A forwards OPTIONS to IMS_A
17										OPTIONS	IMS_A forwards OPTIONS to UE_A
18										200 OK	UE_A responds 200 OK to IMS_A
19										200 OK	IMS_A forwards 200 OK to IBCF_A
20										200 OK	IBCF_A forwards 200 OK to IBCF_B
21										200 OK	IBCF_B forwards 200 OK to IMS_B
22										200 OK	IMS_B forwards 200 OK to UE_B
23											User B is informed of content sharing capabilities of user A
24											User A requests to share content with user B
25										INVITE	UE_A sends INVITE to share content with user B
26										100 Trying	IMS_A responds with a 100 Trying provisional response
27										INVITE	IMS_A forwards INVITE to IBCF_A
28										100 Trying	IBCF_A responds with a 100 Trying provisional response
29										INVITE	IBCF_A forwards INVITE to IBCF_B
30										100 Trying	IBCF_B responds with a 100 Trying provisional response
31										INVITE	IBCF_B forwards INVITE to IMS_B
32										100 Trying	IMS_B responds with a 100 Trying provisional response
33										INVITE	IMS_B forwards INVITE to UE_B
34										100 Trying	UE_B responds with a 100 Trying provisional response
35											User B is requested to accept to share content
36										180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting
37										180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
38										180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
39										180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
40										180 Ringing	IMS_A forwards the 180 Ringing response to UE_A
41											User B accepts to share content
42										200 OK	UE_B responds INVITE with 200 OK to indicate that the request has been accepted

Step	Direction									Message	Comment
	U s e r A	U E _ A	I M S _ A	I B C F _ A	I B C F _ B	I M S _ B	U E _ B	U s e r B			
43										200 OK	IMS_B forwards 200 OK response to IBCF_B
44										200 OK	IBCF_B forwards 200 OK response to IBCF_A
45										200 OK	IBCF_A forwards 200 OK response to IMS_A
46										200 OK	IMS_A forwards 200 OK response to UE_A
47											User A is informed that request has been answered
48										ACK	UE_A acknowledges the receipt of 200 OK for INVITE
49										ACK	IMS_A forwards ACK to IBCF_A
50										ACK	IBCF_A forwards ACK to IBCF_B
51										ACK	IBCF_B forwards ACK to IMS_B
52										ACK	IMS_B forwards ACK to UE_B
53											Content sharing starts
54A											User A terminates voice call
55A											User A ends content sharing
56A										BYE	UE_A releases the call with BYE
57A										BYE	IMS_A forwards BYE to IBCF_A
58A										BYE	IBCF_A forwards BYE to IBCF_B
59A										BYE	IBCF_B forwards BYE to IMS_B
60A										BYE	IMS_B forwards BYE to UE_B
61A											User B is informed that content sharing has ended
62A										200 OK	UE_B sends 200 OK for BYE
63A										200 OK	IMS_B forwards 200 OK response to IBCF_B
64A										200 OK	IBCF_B forwards 200 OK response to IBCF_A
65A										200 OK	IBCF_A forwards 200 OK response to IMS_A
66A										200 OK	IMS_A forwards the 200 OK response to UE_A
67A											Content sharing terminates

#### 4.5.5.2.2 Termination of Voice Call - roaming

Interoperability Test Description		
<b>Identifier:</b>	TD_IMS_SHARE_0004	
<b>Summary:</b>	Termination of voice call during content sharing	
<b>Configuration:</b>	CF_ROAM_CALL	
<b>SUT</b>	IMS_A and IMS_B and UE_B	
<b>References</b>	<b>Test Purpose</b>	<b>Specification Reference</b>
	TP_IMS_CONTENT_SHARING_01	Rich Communication Suite Release 2, Technical realization [10], clause 8.1
	TP_IMS_CONTENT_SHARING_02	Rich Communication Suite Release 2, Technical realization [10], clause 8.1
<b>Use Case ref.:</b>	UC_RCS_11_R	
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userSHARE according to table 1</li> <li>UE_B is registered in IMS_B via IMS_A using userSHARE according to table 1</li> <li>User A and B are subscribed to file transfer service</li> <li>IMS_A within the trust domain of IMS_B</li> <li>UE_A and UE_B support content sharing</li> </ul>	

Interoperability Test Description		
<b>Test Sequence:</b>	<b>Step</b>	
	1	Setup of voice call between User A and user B
	2	Verify that user A is informed of content sharing capabilities of user B
	3	Verify that user B is informed on content sharing capabilities of user A
	4	User A requests to share content with user B
	5	User B is requested to accept to share content
	6	User B accepts to share content with User A
	7	Verify that user A is informed that request has been answered
	8	User A ends voice call
	9	Verify that user B is informed that content sharing terminates
	10	Content sharing terminates
<b>Conformance Criteria:</b>	<b>Check</b>	
	1	TP_IMS_CONTENT_SHARE_01 in CFW step 4 (OPTIONS): ensure that { when { IUT receives an OPTIONS from UE_A addressed_to UE_B } then { IUT sends the OPTIONS to IMS_B containing a Contact_header indicating g.3gpp.cs-voice_feature_tag and containing a Accept-Contact_header indicating g.3gpp.cs-voice_feature_tag } }
	2	TP_IMS_CONTENT_SHARE_02 in CFW step 41 (INVITE): ensure that { when { IUT receives a subsequent content_share INVITE from UE_A addressed_to UE_B } then { IUT sends the INVITE to IMS_B containing a Contact_header indicating g.3gpp.cs-voice_feature_tag and containing a Accept-Contact_header indicating g.3gpp.cs-voice_feature_tag } }

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			→							OPTIONS UE_A sends OPTIONS to IMS_A
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									←	200 OK UE_B responds with 200 OK to IMS_A
11									→	200 OK IMS_A forwards 200 OK to IBCF_A
12									→	200 OK IBCF_A forwards 200 OK to IBCF_B
13									→	200 OK IBCF_B forwards 200 OK to IMS_B
14									←	200 OK IMS_B forwards 200 OK to IBCF_B
15									←	200 OK IBCF_B forwards 200 OK to IBCF_A
16									←	200 OK IBCF_A forwards 200 OK to IMS_A
17									←	200 OK IMS_A forwards 200 OK to UE_A
18										User A is informed on content sharing capabilities of user B
19									←	OPTIONS UE_B sends OPTIONS to IMS_A
20									→	OPTIONS IMS_A forwards OPTIONS to IBCF_A

Step	Direction									Message	Comment
	U s e r A	U E A	I M S A	I B C F A	I B C F B	I M S B	U E B	U s e r B			
21					→					OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
22						→				OPTIONS	IBCF_B forwards OPTIONS to IMS_B
23							←			OPTIONS	IMS_B forwards OPTIONS to IBCF_B
24					←					OPTIONS	IBCF_B forwards OPTIONS to IBCF_A
25				←						OPTIONS	IBCF_A forwards OPTIONS to IMS_A
26				←						OPTIONS	IMS_A forwards OPTIONS to UE_A
27				→						200 OK	UE_A responds 200 OK to IMS_A
28				→						200 OK	IMS_A forwards 200 OK to IBCF_A
29					→					200 OK	IBCF_A forwards 200 OK to IBCF_B
30						→				200 OK	IBCF_B forwards 200 OK to IMS_B
31							←			200 OK	IMS_B forwards 200 OK to IBCF_B
32					←					200 OK	IBCF_B forwards 200 OK to IBCF_A
33				←						200 OK	IBCF_A forwards 200 OK to IMS_A
34								→		200 OK	IMS_A forwards 200 OK to UE_B
35											User B is informed of content sharing capabilities of user A
36											User A requests to share content with user B
37										INVITE	UE_A sends INVITE to share content with user B
38							←			100 Trying	IMS_A responds with a 100 Trying provisional response
39										INVITE	IMS_A forwards INVITE to IBCF_A
40							←			100 Trying	IBCF_A responds with a 100 Trying provisional response
41										INVITE	IBCF_A forwards INVITE to IBCF_B
42							←			100 Trying	IBCF_B responds with a 100 Trying provisional response
43										INVITE	IBCF_B forwards INVITE to IMS_B
44							←			100 Trying	IMS_B responds with a 100 Trying provisional response
45							←			INVITE	IMS_B forwards INVITE to IBCF_B
46										100 Trying	IBCF_B responds with a 100 Trying provisional response
47										INVITE	IBCF_B forwards INVITE to IBCF_A
48										100 Trying	IBCF_A responds with a 100 Trying provisional response
49							←			INVITE	IBCF_A forwards INVITE to IMS_A
50										100 Trying	IMS_A responds with a 100 Trying provisional response
51										INVITE	IMS_A forwards INVITE to UE_B
52										100 Trying	UE_B responds with a 100 Trying provisional response
53											User B is requested to accept to share content
54										180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting
55										180 Ringing	IMS_A forwards 180 Ringing response to IBCF_A
56										180 Ringing	IBCF_A forwards 180 Ringing response to IBCF_B
57										180 Ringing	IBCF_B forwards 180 Ringing response to IMS_B
58										180 Ringing	IMS_B forwards the 180 Ringing response to IBCF_B
59										180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
60										180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A



Step	Direction								Message	Comment
	U s e r A	U E A	I M S A	I B C F A	I B C F B	I M S B	U E B	U s e r B		
61			←						180 Ringing	IMS_A forwards 180 Ringing response to UE_A
62								←		User B accepts to share content
63			←						200 OK	UE_B responds INVITE with 200 OK to indicate that the request has been accepted
64				→					200 OK	IMS_A forwards 200 OK response to IBCF_A
65					→				200 OK	IBCF_A forwards 200 OK response to IBCF_B
66						→			200 OK	IBCF_B forwards 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			←							IMS_A forwards 200 OK response to UE_A
71	←									User A is informed that request has been answered
72		→							ACK	UE_A acknowledges the receipt of 200 OK for INVITE
73		→							ACK	IMS_A forwards ACK to IBCF_A
74				→					ACK	IBCF_A forwards ACK to IBCF_B
75					→				ACK	IBCF_B forwards ACK to IMS_B
76					←				ACK	IMS_B forwards ACK to IBCF_B
77				←					ACK	IBCF_B forwards ACK to IBCF_A
78			←						ACK	IBCF_A forwards ACK to IMS_A
79			→						ACK	IMS_A forwards ACK to UE_B
80								→		Content sharing starts
81	←							→		User A terminates voice call
82A	←							→		User A ends content sharing
83A		→							BYE	UE_A releases the call with BYE
84A				→					BYE	IMS_A forwards BYE to IBCF_A
85A					→				BYE	IBCF_A forwards BYE to IBCF_B
86A						→			BYE	IBCF_B forwards BYE to IMS_B
87A					←				BYE	IMS_B forwards BYE to IBCF_B
88A				←					BYE	IBCF_B forwards BYE to IBCF_A
89A			←						BYE	IBCF_A forwards BYE to IMS_A
90A			→					→	BYE	IMS_A forwards BYE to UE_B
91A								→		User B is informed that content sharing has ended
92A			←						200 OK	UE_B sends 200 OK for BYE
93A				→					200 OK	IMS_A forwards 200 OK response to IBCF_A
94A					→				200 OK	IBCF_A forwards 200 OK response to IBCF_B
95A						→			200 OK	IBCF_B forwards 200 OK response to IMS_B
96A					←				200 OK	IMS_B forwards the 200 OK response to IBCF_B
97A				←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
98A			←						200 OK	IBCF_A forwards 200 OK response to IMS_A
99A			←						200 OK	IMS_A forwards the 200 OK response to UE_A
100A										Content sharing terminates

4.5.5.3 Content Sharing from called to calling user

4.5.5.3.1 Content Sharing from called to calling user - interworking

Interoperability Test Description		
<b>Identifier:</b>	TD_IMS_SHARE_0005	
<b>Summary:</b>	User A sets up a voice call to user B and user B shares content with user A.	
<b>Configuration:</b>	CF_INT_CALL	
<b>SUT</b>	IMS_A and IMS_B and UE_B	
<b>References</b>	<b>Test Purpose</b>	<b>Specification Reference</b>
	TP_IMS_CONTENT_SHARING_02	Rich Communication Suite Release 2, Technical realization [10], clause 8.1
<b>Use Case ref.:</b>	UC_RCS_11_I	
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS_B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userSHARE according to table 1</li> <li>UE_B is registered in IMS_B using userSHARE according to table 1</li> <li>User A and B are subscribed to file transfer service</li> <li>IMS_A within the trust domain of IMS_B</li> <li>UE_A and UE_B support content sharing</li> </ul>	
<b>Test Sequence:</b>	<b>Step</b>	
	1	Setup of voice call between User A and user B
	2	Verify that user A is informed of content sharing capabilities of user B
	3	Verify that user B is informed on content sharing capabilities of user A
	4	User B wishes to share content with user A
	5	User A is requested to share content
	6	User A accepts to share content with User B
	7	Verify that user B is informed that request has been answered
	8	User B ends content sharing
	9	Verify that user A is informed that content sharing terminates
	10	Content sharing terminates
11	User A ends voice call	
<b>Conformance Criteria:</b>	<b>Check</b>	
	1	TP_IMS_CONTENT_SHARE_01 in CFW step 4 (OPTIONS): ensure that { when { IUT receives an OPTIONS from UE_A addressed_to UE_B } then { IUT sends the OPTIONS to IMS_B containing a Contact_header indicating g.3gpp.cs-voice_feature_tag and containing a Accept-Contact_header indicating g.3gpp.cs-voice_feature_tag } }

Step	Direction								Message	Comment
	U s e r A	U E A	I M S A	I B C F A	I B C F B	I M S B	U E B	U s e r B		
1										User A sets up a voice call to user B
12										User A is informed on content sharing capabilities of user B
23										User B is informed of content sharing capabilities of user A
24										User B wishes to share content with user A
25										INVITE UE_B sends INVITE to share content with user A
26										100 Trying IMS_B responds with a 100 Trying provisional response
27										INVITE IMS_B forwards INVITE to IBCF_B

Step	Direction									Message	Comment
	U s e r A	U E A	I M S A	I B C F A	I B C F B	I M S B	U E B	U s e r B			
28										100 Trying	IBCF_B responds with a 100 Trying provisional response
29										INVITE	IBCF_B forwards INVITE to IBCF_A
30										100 Trying	IBCF_A responds with a 100 Trying provisional response
31										INVITE	IBCF_A forwards INVITE to IMS_A
32										100 Trying	IMS_A responds with a 100 Trying provisional response
33										INVITE	IMS_A forwards INVITE to UE_A
34										100 Trying	UE_A responds with a 100 Trying provisional response
35											User A is requested to share content
36										180 Ringing	UE_A responds to initial INVITE with 180 Ringing to indicate that it has started alerting
37										180 Ringing	IMS_A forwards 180 Ringing response to IBCF_A
38										180 Ringing	IBCF_A forwards 180 Ringing response to IBCF_B
39										180 Ringing	IBCF_B forwards 180 Ringing response to IMS_B
40										180 Ringing	IMS_B forwards the 180 Ringing response to UE_B
41											User A accepts to share content
42										200 OK	UE_A responds INVITE with 200 OK to indicate that the request has been accepted
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 UE_B
47											User B is informed that request has been answered
48										ACK	UE_B acknowledges the receipt of 200 OK for INVITE
49										ACK	IMS_B forwards ACK to IBCF_B
50										ACK	IBCF_B forwards ACK to IBCF_A
51										ACK	IBCF_A forwards ACK to IMS_A
52										ACK	IMS_A forwards ACK to UE_A
53											Content sharing starts
54B											User B ends content sharing
60B											User A is informed that content sharing has ended
66B											Content sharing terminates
67B										...	User B terminates voice call

## 4.5.5.3.2

## Content Sharing from called to calling user - roaming

Interoperability Test Description		
Identifier:	TD_IMS_SHARE_0006	
Summary:	User A sets up a voice call to user B and user B shares content with user A.	
Configuration:	CF_ROAM_CALL	
SUT	IMS_A and IMS_B and UE_B	
References	Test Purpose	Specification Reference
	TP_IMS_CONTENT_SHARING_01	Rich Communication Suite Release 2, Technical realization [10], clause 8.1
Use Case ref.:	UC_RCS_11_R	

Interoperability Test Description		
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userSHARE according to table 1</li> <li>UE_B is registered in IMS_B via IMS_A using userSHARE according to table 1</li> <li>User A and B are subscribed to file transfer service</li> <li>IMS_A within the trust domain of IMS_B</li> <li>UE_A and UE_B support content sharing</li> </ul>	
<b>Test Sequence:</b>	<b>Step</b>	
	1	Setup of voice call between User A and user B
	2	Verify that user A is informed of content sharing capabilities of user B
	3	Verify that user B is informed on content sharing capabilities of user A
	4	User B wishes to share content with user A
	5	User A is requested to share content
	6	User A accepts to share content with User B
	7	Verify that user B is informed that request has been answered
	8	User B ends content sharing
	9	Verify that user A is informed that content sharing terminates
	10	Content sharing terminates
11	User A ends voice call	
<b>Conformance Criteria:</b>	<b>Check</b>	
	1	TP_IMS_CONTENT_SHARE_01 in CFW step 4 (OPTIONS): <i>ensure that {</i> <i>  when { IUT receives an OPTIONS from UE_A addressed_to UE_B }</i> <i>  then { IUT sends the OPTIONS to IMS_B</i> <i>    containing a Contact_header</i> <i>    indicating g.3gpp.cs-voice_feature_tag and</i> <i>    containing a Accept-Contact_header</i> <i>    indicating g.3gpp.cs-voice_feature_tag }</i> <i>}</i>

Step	Direction									Message	Comment
	U s e r A	U E A	I M S A	I B C F A	I B C F B	I M S B	U E B	U s e r B			
1A											User A sets up a voice call to user B
1B											User B sets up a voice call to user A
18											User A is informed on content sharing capabilities of user B
35											User B is informed of content sharing capabilities of user A
36											User B wishes to share content with user A
37										INVITE	UE_B sends INVITE to share content with user A
38										100 Trying	IMS_A responds with a 100 Trying provisional response
39										INVITE	IMS_A forwards INVITE to IBCF_A
40										100 Trying	IBCF_A responds with a 100 Trying provisional response
41										INVITE	IBCF_A forwards INVITE to IBCF_B
42										100 Trying	IBCF_B responds with a 100 Trying provisional response
43										INVITE	IBCF_B forwards INVITE to IMS_B
44										100 Trying	IMS_B responds with a 100 Trying provisional response
45										INVITE	IMS_B forwards INVITE to IBCF_B
46										100 Trying	IBCF_B responds with a 100 Trying provisional response
47										INVITE	IBCF_B forwards INVITE to IBCF_A

Step	Direction									Message	Comment
	U s e r A	U E A	I M S A	I B C F A	I B C F B	I M S B	U E B	U s e r B			
48					→					100 Trying	IBCF_A responds with a 100 Trying provisional response
49				←						INVITE	IBCF_A forwards INVITE to IMS_A
50					→					100 Trying	IMS_A responds with a 100 Trying provisional response
51				←						INVITE	IMS_A forwards INVITE to UE_A
52					→					100 Trying	UE_A responds with a 100 Trying provisional response
53	←										User A is requested to share content
54					→					180 Ringing	UE_A responds to initial INVITE with 180 Ringing to indicate that it has started alerting
55					→					180 Ringing	IMS_A forwards 180 Ringing response to IBCF_A
56					→					180 Ringing	IBCF_A forwards 180 Ringing response to IBCF_B
57						→				180 Ringing	IBCF_B forwards 180 Ringing response to IMS_B
58						←				180 Ringing	IMS_B forwards the 180 Ringing response to IBCF_B
59					←					180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
60					←					180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
61								→		180 Ringing	IMS_A forwards 180 Ringing response to UE_B
62											User A accepts to share content
63					→					200 OK	UE_A responds INVITE with 200 OK to indicate that the request has been accepted
64					→					200 OK	IMS_A forwards 200 OK response to IBCF_A
65					→					200 OK	IBCF_A forwards 200 OK response to IBCF_B
66						→				200 OK	IBCF_B forwards 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								→			IMS_A forwards 200 OK response to UE_B
71									→		User B is informed that request has been answered
72					←					ACK	UE_A acknowledges the receipt of 200 OK for INVITE
73					→					ACK	IMS_A forwards ACK to IBCF_A
74					→					ACK	IBCF_A forwards ACK to IBCF_B
75						→				ACK	IBCF_B forwards ACK to IMS_B
76						←				ACK	IMS_B forwards ACK to IBCF_B
77					←					ACK	IBCF_B forwards ACK to IBCF_A
78					←					ACK	IBCF_A forwards ACK to IMS_A
79					←					ACK	IMS_A forwards ACK to UE_A
80	←										Content sharing starts
81A	←										User B ends content sharing
82A					←					BYE	UE_B releases the call with BYE
83A					→					BYE	IMS_A forwards BYE to IBCF_A
84A					→					BYE	IBCF_A forwards BYE to IBCF_B
85A						→				BYE	IBCF_B forwards BYE to IMS_B
86A						←				BYE	IMS_B forwards BYE to IBCF_B
87A					←					BYE	IBCF_B forwards BYE to IBCF_A
88A					←					BYE	IBCF_A forwards BYE to IMS_A
89A					←					BYE	IMS_A forwards BYE to UE_A

Step	Direction									Message	Comment
	U s e r A	U E A	I M S A	I B C F A	I B C F B	I M S B	U E B	U s e r B			
90A											User A is informed that content sharing has ended
91A										200 OK	UE_A sends 200 OK for BYE
92A										200 OK	IMS_A forwards 200 OK response to IBCF_A
93A										200 OK	IBCF_A forwards 200 OK response to IBCF_B
94A										200 OK	IBCF_B forwards 200 OK response to IMS_B
95A										200 OK	IMS_B forwards the 200 OK response to IBCF_B
96A										200 OK	IBCF_B forwards 200 OK response to IBCF_A
97A										200 OK	IBCF_A forwards 200 OK response to IMS_A
98A										200 OK	IMS_A forwards the 200 OK response to UE_A
99A											Content sharing terminates
100A											User A terminates voice call

#### 4.5.5.4 User without content sharing capability

##### 4.5.5.4.1 User without content sharing capability - interworking

Interoperability Test Description		
<b>Identifier:</b>	TD_IMS_SHARE_0007	
<b>Summary:</b>	User A receive information that content sharing is not possible with user B.	
<b>Configuration:</b>	CF_INT_CALL	
<b>SUT</b>	IMS_A and IMS_B and UE_B	
<b>References</b>	<b>Test Purpose</b>	<b>Specification Reference</b>
	TP_IMS_CONTENT_SHARING_01	Rich Communication Suite Release 2, Technical realization [10], clause 8.1
<b>Use Case ref.:</b>	UC_RCS_11_I	
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userSHARE according to table 1</li> <li>UE_B is registered in IMS_B using userSHARE according to table 1</li> <li>User A and B are subscribed to file transfer service</li> <li>IMS_A within the trust domain of IMS_B</li> <li>UE_A supports content sharing</li> <li>UE_B does not support content sharing or has service disabled</li> </ul>	
<b>Test Sequence:</b>	<b>Step</b>	
	1	Setup of voice call between User A and user B
	2	Verify that user A is informed that user B cannot share content.
	3	Verify that user B is informed on content sharing capabilities of user A
	4	User A ends voice call
<b>Conformance Criteria:</b>	<b>Check</b>	
	1	TP_IMS_CONTENT_SHARE_01 in CFW step 4 (OPTIONS): ensure that { when { IUT receives an OPTIONS from UE_A addressed_to UE_B } then { IUT sends the OPTIONS to IMS_B containing a Contact_header indicating g.3gpp.cs-voice_feature_tag and containing a Accept-Contact_header indicating g.3gpp.cs-voice_feature_tag } }

Step	Direction									Message	Comment
	U s e r A	U E A	I M S A	I B C F A	I B C F B	I M S B	U E B	U s e r B			
1											User A sets up a voice call to user B
2										OPTIONS	UE_A sends OPTIONS to IMS_A
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										200 OK	UE_B responds with 200 OK to IMS_B
8										200 OK	IMS_B forwards 200 OK to IBCF_B
9										200 OK	IBCF_B forwards 200 OK to IBCF_A
10										200 OK	IBCF_A forwards 200 OK to IMS_A
11										200 OK	IMS_A forwards 200 OK to UE_A
12											User A is informed that user B cannot share content.
13										OPTIONS	UE_B sends OPTIONS to IMS_B
14										OPTIONS	IMS_B forwards OPTIONS to IBCF_B
15										OPTIONS	IBCF_B forwards OPTIONS to IBCF_A
16										OPTIONS	IBCF_A forwards OPTIONS to IMS_A
17										OPTIONS	IMS_A forwards OPTIONS to UE_A
18										200 OK	UE_A responds 200 OK to IMS_A
19										200 OK	IMS_A forwards 200 OK to IBCF_A
20										200 OK	IBCF_A forwards 200 OK to IBCF_B
21										200 OK	IBCF_B forwards 200 OK to IMS_B
22										200 OK	IMS_B forwards 200 OK to UE_B
23											User B is informed of content sharing capabilities of user A
24										...	User A terminates voice call

## 4.5.5.4.2 User without content sharing capability - roaming

Interoperability Test Description		
<b>Identifier:</b>	TD_IMS_SHARE_0008	
<b>Summary:</b>	User A receive information that content sharing is not possible with user B.	
<b>Configuration:</b>	CF_ROAM_CALL	
<b>SUT</b>	IMS_A and IMS_B and UE_B	
<b>References</b>	<b>Test Purpose</b>	<b>Specification Reference</b>
	TP_IMS_CONTENT_SHARING_01	Rich Communication Suite Release 2, Technical realization [10], clause 8.1
<b>Use Case ref.:</b>	UC_RCS_11_R	
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userSHARE according to table 1</li> <li>UE_B is registered in IMS_B via IMS_A using userSHARE according to table 1</li> <li>User A and B are subscribed to file transfer service</li> <li>IMS_A within the trust domain of IMS_B</li> <li>UE_A supports content sharing</li> <li>UE_B does not support content sharing or has service disabled</li> </ul>	
<b>Test Sequence:</b>	<b>Step</b>	
	1	Setup of voice call between User A and user B
	2	Verify that user A is informed that user B cannot share content.
	3	Verify that user B is informed on content sharing capabilities of user A
	4	User A ends voice call

Interoperability Test Description		
Conformance Criteria:	Check	
	1	TP_IMS_CONTENT_SHARING_01in CFW step 4 (OPTIONS): ensure that { when { IBCF_A receives an OPTIONS from UE_A} then { IBCF_A sends a OPTIONS to IBCF_B containing Contact_header including g.3gpp.cs-voice_featuretag and Accept-Contact_header including g.3gpp.cs-voice_featuretag } }

Step	Direction								Message	Comment
	U s e r A	U E A	I M S A	I B C F A	I B C F B	I M S B	U E B	U s e r B		
1A										User A sets up a voice call to user B
2									OPTIONS	UE_A sends OPTIONS to IMS_A
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									200 OK	UE_B responds with 200 OK to IMS_A
11									200 OK	IMS_A forwards 200 OK to IBCF_A
12									200 OK	IBCF_A forwards 200 OK to IBCF_B
13									200 OK	IBCF_B forwards 200 OK to IMS_B
14									200 OK	IMS_B forwards 200 OK to IBCF_B
15									200 OK	IBCF_B forwards 200 OK to IBCF_A
16									200 OK	IBCF_A forwards 200 OK to IMS_A
17									200 OK	IMS_A forwards 200 OK to UE_A
18										User A is informed that user B cannot share content.
19									OPTIONS	UE_B sends OPTIONS to IMS_A
20									OPTIONS	IMS_A forwards OPTIONS to IBCF_A
21									OPTIONS	IBCF_A forwards OPTIONS to IBCF_B
22									OPTIONS	IBCF_B forwards OPTIONS to IMS_B
23									OPTIONS	IMS_B forwards OPTIONS to IBCF_B
24									OPTIONS	IBCF_B forwards OPTIONS to IBCF_A
25									OPTIONS	IBCF_A forwards OPTIONS to IMS_A
26									OPTIONS	IMS_A forwards OPTIONS to UE_A
27									200 OK	UE_A responds 200 OK to IMS_A
28									200 OK	IMS_A forwards 200 OK to IBCF_A
29									200 OK	IBCF_A forwards 200 OK to IBCF_B
30									200 OK	IBCF_B forwards 200 OK to IMS_B
31									200 OK	IMS_B forwards 200 OK to IBCF_B
32									200 OK	IBCF_B forwards 200 OK to IBCF_A
33									200 OK	IBCF_A forwards 200 OK to IMS_A
34									200 OK	IMS_A forwards 200 OK to UE_B
35										User B is informed of content sharing capabilities of user A
100A										User A terminates voice call



## 4.5.5.5 Content sharing rejection

## 4.5.5.5.1 Content sharing rejection - interworking

Interoperability Test Description		
<b>Identifier:</b>	TD_IMS_SHARE_0009	
<b>Summary:</b>	User B rejects to share content with user A	
<b>Configuration:</b>	CF_INT_CALL	
<b>SUT</b>	IMS_A and IMS_B and UE_B	
<b>References</b>	<b>Test Purpose</b>	<b>Specification Reference</b>
	TP_IMS_CONTENT_SHARING_01	Rich Communication Suite Release 2, Technical realization [10], clause 8.1
	TP_IMS_CONTENT_SHARING_03	Rich Communication Suite Release 2, Technical realization [10], clause 8.1
<b>Use Case ref.:</b>	UC_RCS_11_I	
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS_B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userSHARE according to table 1</li> <li>UE_B is registered in IMS_B using userSHARE according to table 1</li> <li>User A and B are subscribed to file transfer service</li> <li>IMS_A within the trust domain of IMS_B</li> <li>UE_A and UE_B support content sharing</li> </ul>	
<b>Test Sequence:</b>	<b>Step</b>	
	1	Setup of voice call between user A and user B
	2	Verify that user A is informed of content sharing capabilities of user B
	3	Verify that user B is informed on content sharing capabilities of user A
	4	User A requests to share content with user B
	5	User B is requested to accept to share content
	6	User B rejects to share content with User A
	7	Verify that user A is informed that request has been rejected
	8	User A ends voice call
<b>Conformance Criteria:</b>	<b>Check</b>	
	1	TP_IMS_CONTENT_SHARE_01 in CFW step 4 (OPTIONS): <i>ensure that { when { IUT receives an OPTIONS from UE_A addressed_to UE_B } then { IUT sends the OPTIONS to IMS_B containing a Contact_header indicating g.3gpp.cs-voice_feature_tag and containing a Accept-Contact_header indicating g.3gpp.cs-voice_feature_tag } }</i>
	3	TP_IMS_CONTENT_SHARING_03 in CFW step 38 (603 response): <i>ensure that { when { IUT receives a 603_response from UE_B addressed_to UE_A } then { IUT sends the 603_response to IMS_A } }</i>

Step	Direction									Message	Comment
	U s e r A	U E A	I M S A	I B C F A	I B C F B	I M S B	U E B	U s e r B			
1											User A sets up a voice call to user B
12											User A is informed on content sharing capabilities of user B
23											User B is informed of content sharing capabilities of user A
24											User A requests to share content with user B

Step	Direction									Message	Comment
	U s e r A	U E A	I M S A	I B C F A	I B C F B	I M S B	U E B	U s e r B			
25			→							INVITE	UE_A sends INVITE to share content with user B
26		←								100 Trying	IMS_A responds with a 100 Trying provisional response
27			→							INVITE	IMS_A forwards INVITE to IBCF_A
28			←							100 Trying	IBCF_A responds with a 100 Trying provisional response
29				→						INVITE	IBCF_A forwards INVITE to IBCF_B
30				←						100 Trying	IBCF_B responds with a 100 Trying provisional response
31					→					INVITE	IBCF_B forwards INVITE to IMS_B
32					←					100 Trying	IMS_B responds with a 100 Trying provisional response
33						→				INVITE	IMS_B forwards INVITE to UE_B
34						←				100 Trying	UE_B responds with a 100 Trying provisional response
35											User B is requested to accept to share content
36						←				180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting
37					←					180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
38				←						180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
39			←							180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
40		←								180 Ringing	IMS_A forwards the 180 Ringing response to UE_A
41								←			User B rejects to share content
42						←				603 Decline	UE_B responds INVITE with 603 Decline to indicate that the request has been rejected
43					←					603 Decline	IMS_B forwards 603 Decline response to IBCF_B
44				←						603 Decline	IBCF_B forwards 603 Decline response to IBCF_A
45			←							603 Decline	IBCF_A forwards 603 Decline response to IMS_A
46		←								603 Decline	IMS_A forwards 603 Decline response to UE_A
47	←										User A is informed that request has been rejected
48		→								ACK	UE_A acknowledges the receipt of 603 Decline for INVITE
49			→							ACK	IMS_A forwards ACK to IBCF_A
50				→						ACK	IBCF_A forwards ACK to IBCF_B
51					→					ACK	IBCF_B forwards ACK to IMS_B
52						→				ACK	IMS_B forwards ACK to UE_B
53											User A terminates voice call

4.5.5.5.2 Content sharing rejection - roaming

Interoperability Test Description		
<b>Identifier:</b>	TD_IMS_SHARE_0010	
<b>Summary:</b>	Content sharing rejection	
<b>Configuration:</b>	CF_ROAM_CALL	
<b>SUT</b>	User B rejects to share content with user A	
<b>References</b>	<b>Test Purpose</b>	<b>Specification Reference</b>
	TP_IMS_CONTENT_SHARING_01	Rich Communication Suite Release 2, Technical realization [10], clause 8.1
	TP_IMS_CONTENT_SHARING_04	Rich Communication Suite Release 2, Technical realization [10], clause 8.1
<b>Use Case ref.:</b>	UC_RCS_11_R	
<b>Pre-test conditions:</b>	<ul style="list-style-type: none"> <li>HSS of IMS_A and of IMS B is configured according to table 1</li> <li>UE_A and UE_B have IP bearers established to their respective IMS networks as per TS 186 011-2 [11], clause 4.2.1</li> <li>UE_A is registered in IMS_A using userSHARE according to table 1</li> <li>UE_B is registered in IMS_B via IMS_A using userSHARE according to table 1</li> <li>User A and B are subscribed to file transfer service</li> <li>IMS_A within the trust domain of IMS_B</li> <li>UE_A and UE_B support content sharing</li> </ul>	
<b>Test Sequence:</b>	<b>Step</b>	
	1	Setup of voice call between User A and user B
	2	Verify that user A is informed of content sharing capabilities of user B
	3	Verify that user B is informed on content sharing capabilities of user A
	4	User A requests to share content with user B
	5	User B is requested to accept to share content
	6	User B rejects to share content with User A
	7	Verify that user A is informed that request has been rejected
	8	User A ends voice call
<b>Conformance Criteria:</b>	<b>Check</b>	
	1	TP_IMS_CONTENT_SHARE_01 in CFW step 4 (OPTIONS): ensure that { when { IUT receives an OPTIONS from UE_A addressed_to UE_B } then { IUT sends the OPTIONS to IMS_B containing a Contact_header indicating g.3gpp.cs-voice_feature_tag and containing a Accept-Contact_header indicating g.3gpp.cs-voice_feature_tag } }
	3	TP_IMS_CONTENT_SHARING_04 in CFW step 65 (603 response): ensure that { when { IUT receives a 603_response from UE_B addressed_to UE_A } then { IUT sends the 603_response to IMS_B } }

Step	Direction								Message	Comment
	U s e r A	U E A	I M S A	I B C F A	I B C F B	I M S B	U E B	U s e r B		
1A										User A sets up a voice call to user B
18										User A is informed on content sharing capabilities of user B
35										User B is informed of content sharing capabilities of user A
36										User A requests to share content with user B
37									INVITE	UE_A sends INVITE to share content with user B
38									100 Trying	IMS_A responds with a 100 Trying provisional response

Step	Direction									Message	Comment
	U s e r A	U E A	I M S A	I B C F A	I B C F B	I M S B	U E B	U s e r B			
39			→							INVITE	IMS_A forwards INVITE to IBCF_A
40			←							100 Trying	IBCF_A responds with a 100 Trying provisional response
41				→						INVITE	IBCF_A forwards INVITE to IBCF_B
42				←						100 Trying	IBCF_B responds with a 100 Trying provisional response
43					→					INVITE	IBCF_B forwards INVITE to IMS_B
44					←					100 Trying	IMS_B responds with a 100 Trying provisional response
45					←					INVITE	IMS_B forwards INVITE to IBCF_B
46										100 Trying	IBCF_B responds with a 100 Trying provisional response
47				←						INVITE	IBCF_B forwards INVITE to IBCF_A
48				→						100 Trying	IBCF_A responds with a 100 Trying provisional response
49			←							INVITE	IBCF_A forwards INVITE to IMS_A
50			→							100 Trying	IMS_A responds with a 100 Trying provisional response
51								→		INVITE	IMS_A forwards INVITE to UE_B
52								←		100 Trying	UE_B responds with a 100 Trying provisional response
53								→			User B is requested to accept to share content
54								←		180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting
55				→						180 Ringing	IMS_A forwards 180 Ringing response to IBCF_A
56				→						180 Ringing	IBCF_A forwards 180 Ringing response to IBCF_B
57					→					180 Ringing	IBCF_B forwards 180 Ringing response to IMS_B
58					←					180 Ringing	IMS_B forwards the 180 Ringing response to IBCF_B
59					←					180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
60					←					180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
61			←							180 Ringing	IMS_A forwards 180 Ringing response to UE_A
62								←			User B rejects to share content
63								←		603 Decline	UE_B responds INVITE with 603 Decline to indicate that the request has been accepted
64				→						603 Decline	IMS_A forwards 603 Decline response to IBCF_A
65				→						603 Decline	IBCF_A forwards 603 Decline response to IBCF_B
66					→					603 Decline	IBCF_B forwards 603 Decline response to IMS_B
67					←					603 Decline	IMS_B forwards 603 Decline response to IBCF_B
68					←					603 Decline	IBCF_B forwards 603 Decline response to IBCF_A
69					←					603 Decline	IBCF_A forwards 603 Decline response to IMS_A
70			←							603 Decline	IMS_A forwards 603 Decline response to UE_A
71	←										User A is informed that request has been rejected
72			→							ACK	UE_A acknowledges the receipt of 603 Decline for INVITE
73			→							ACK	IMS_A forwards ACK to IBCF_A

Step	Direction									Message	Comment
	U s e r A	U E A	I M S A	I B C F A	I B C F B	I M S B	U E B	U s e r B			
74					→					ACK	IBCF_A forwards ACK to IBCF_B
75						→				ACK	IBCF_B forwards ACK to IMS_B
76						←				ACK	IMS_B forwards ACK to IBCF_B
77					←					ACK	IBCF_B forwards ACK to IBCF_A
78				←						ACK	IBCF_A forwards ACK to IMS_A
79				→						ACK	IMS_A forwards ACK to UE_B
100	←										User A terminates voice call

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## Annex A (informative): Bibliography

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ETSI TR 123 981: "Universal Mobile Telecommunications System (UMTS); LTE; Interworking aspects and migration scenarios for IPv4-based IP Multimedia Subsystem (IMS) implementations (3GPP TR 23.981 Release 8)".

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## History

<b>Document history</b>		
V1.1.1	June 2011	Publication