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Part 2: Test description for IMS NNI Interoperability

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Contents

Intelle	ctual Property Rights	7
Forew	ord	7
Introdu	uction	7
1	Scope	8
2	References	8
2.1	Normative references	8
2.2	Informative references	9
3	Abbreviations	10
	IMS NNI Interoperability Test Specification	
4.1	Introduction	
4.2	Test Prerequisites	
4.2.1	IP Version	
4.2.2	Authentication and Security	
4.2.3	Registration and Subscription	
4.2.3.1	SIP Call Flow	
4.2.3.1		
4.2.3.1.		
4.2.3.1		
4.2.4	Supported Options	
4.2.4.1	Security	
4.2.4.2		
4.2.5	Number Resolution	14
4.3	Test Infrastructure	14
4.3.1	Core IMS Nodes	15
4.3.1.1	P-CSCF	15
4.3.1.1.		
4.3.1.1.		
4.3.1.2	E	
4.3.1.2		
4.3.1.2		
4.3.1.3	· · · · · · · · · · · · · · · · · · ·	
4.3.1.3 4.3.1.3.		
4.3.1.3. 4.3.1.3.		
	8	
4.3.1.4		
4.3.1.4.		
4.3.1.4	e	
4.3.1.5		
4.3.1.5		
4.3.1.5		
4.3.1.6		
4.3.1.6		17
4.3.1.6	.2 Node Configuration	17
4.3.1.7	MRFP	17
4.3.1.7	.1 Relevant Interfaces	17
4.3.1.7	.2 Node Configuration	17
4.3.1.8	MGCF	17
4.3.1.8		
4.3.1.8		
4.3.1.9		
4.3.1.9		
4.3.1.9.		
4.3.1.10		
4.3.1.10 4.3.1.10		
+.J.1.I\	U. I ROICVAIR HILCHACES	10

4.3.1.10.2	Node Configuration	18
4.3.2	External IMS core Nodes	18
4.3.2.1	UE	
4.3.2.1.1	Relevant Interfaces	18
4.3.2.1.2	Node Configuration	
4.3.2.2	AS	
4.3.2.2.1	Relevant Interfaces	
4.3.2.2.2	Node Configuration	
4.3.3	Supporting IMS Nodes	
4.3.3.1	DNS	
4.3.3.1.1	Relevant Interfaces	
4.3.3.1.2	Node Configuration	
4.3.3.2	ENUM	
4.3.3.2.1	Local ENUM Solution	
4.3.3.2.2	Common ENUM Solution	
4.3.3.2.3	Node Configuration	
4.3.4	Test Configurations	
4.4	Use Cases	
4.4.1	IMS Registration in a Visited Network	
4.4.1.1	Description	
4.4.1.2	UC_01_R: SIP message flow for IMS registration with CF ROAM ROAM	
4.4.2	User-initiated VoIP call setup and release	
4.4.2.1	Normal Call	
4.4.2.1.1	Description	
4.4.2.1.2	UC_02_I: SIP Call Flow "Normal Call" with CF_INT_CALL	
4.4.2.1.3	UC_02_R: SIP Call Flow "Normal Call" with CF_ROAM_CALL	
4.4.3 4.4.3.1	User-initiated call hold and resume	
4.4.3.1.1	Description	
4.4.3.1.1	UC_03_I: SIP Call Flow "call hold and resume" using reINVITE with CF_INT_CALL	
4.4.3.1.2	UC_03_R: SIP Call Flow "call hold and resume" using reINVITE with CF_IN1_CALL UC_03_R: SIP Call Flow "call hold and resume" using reINVITE with CF_ROAM_CALL	
4.4.3.1.3	User-initiated call hold and resume using UPDATE	
4.4.3.2.1	Description	
4.4.3.2.2	UC_04_I: SIP Call Flow "call hold and resume" using UPDATE with CF_INT_CALL	
4.4.3.2.3	UC_04_R: SIP Call Flow "call hold and resume" using UPDATE with CF_ROAM_CALL	
4.4.4	IMS message exchange between UEs in different networks	
4.4.4.1	Description	
4.4.4.2	UC_05_I: SIP Call flow for IMS Message Exchange with CF_INT_CALL	
4.4.4.3	UC_05_R: SIP Call Flow for IMS Message Exchange with CF_ROAM_CALL	
4.4.5	Supplementary Service Anonymous Communication Rejection (ACR)	
4.4.5.1	Description	
4.4.5.2	UC_06_I: SIP message flow for SS ACR with CF_INT_AS	
4.4.5.3	UC_06_R: SIP message flow for SS ACR with CF_ROAM_AS	
4.4.6	Supplementary Service Outgoing Communication Barring (OCB)	
4.4.6.1	Description	63
4.4.6.2	UC_07_I: SIP message flow for SS OCB with CF_INT_AS	64
4.4.6.3	UC_07_R: SIP message flow for SS OCB with CF_ROAM_AS	
4.4.7	Supplementary Service Originating Identification Presentation (OIP)	65
4.4.7.1	Description	
4.4.7.2	UC_08_I: SIP message flow for SS OIP with CF_INT_AS	
4.4.7.3	UC_08_R: SIP message flow for SS OIP with CF_ROAM_AS	
4.4.8	Supplementary Service Originating Identification Restriction (OIR)	
4.4.8.1	Description	
4.4.8.2	UC_09_I: SIP message flow for SS OIR with CF_INT_AS	
4.4.8.3	UC_09_R: SIP message flow for SS OIR with CF_ROAM_AS	
4.4.9	Supplementary Service HOLD	
4.4.9.1	Description	78
4.4.9.1.1	UC_10_I: SIP Call Flow "call hold and resume with AS tone" using reINVITE with	
4 4 0 1 2	CF_INT_AS	/8
4.4.9.1.2	UC_10_R: SIP Call Flow "call hold and resume with AS tone" using reINVITE with	0.0
4.4.10	CF_ROAM_AS Supplementary Service Call Forward Unconditional (CFU)	

4.4.10.1	Description	
4.4.10.1.1	UC_11_I: SIP Call Flow "Communication Forwarding unconditional" with CF_INT_AS	
4.4.10.1.2	UC_11_R: SIP Call Flow "Communication Forwarding unconditional" with CF_ROAM_AS	
4.4.10.1.3	UC_12: SIP Call Flow "Normal Call" with 2 UEs registered to same public identity	94
4.4.11	Addition of media stream	97
4.4.11.1	Description	97
4.4.11.1.1	UC_13: SIP Call Flow "Addition of media stream using reINVITE"	97
4.4.12	Removal of media stream	101
4.4.12.1	Description	101
4.4.12.1.1	UC_14: SIP Call Flow "Removal of media streams using UPDATE"	102
4.4.12.1.2	UC_15: SIP Call Flow "Removal of media streams using reINVITE"	
4.4.13	Ad-hoc Conferencing service	
4.4.13.1	Description	
4.4.13.2	UC_16: SIP Call Flow "Ad-hoc Conference call"	
4.4.14	Presence service	
4.4.15	IPTV service	
4.4.15.1	Broadcast (BC) Session	
4.4.15.1.1	Description	
4.4.15.1.2	UC_19: BC session	
4.4.15.2	Content on Demand (CoD) Session	
4.4.15.2.1	Description	
4.4.15.2.1	UC_20: CoD session establishing content control channel and content delivery channels	110
4.4.13.2.2		110
4 4 15 0 2	separately (RTSP Method 1)	110
4.4.15.2.3	UC_21: CoD session establishing content control channel and content delivery channels	110
4 4 15 2	separately using RTSP Method 2	
4.4.15.3	Request for Network PVR offline capture	
4.4.15.3.1	Description	
4.4.15.3.2	UC_22: Request for Network PVR offline capture.	
4.4.16	IMS-PSTN Interoperability	
4.4.16.1	IMS-to-PSTN call	
4.4.16.1.1	Description	
4.4.16.1.2	UC_23: IMS-to-PSTN call	
4.4.16.2	PSTN-to-IMS call	
4.4.16.2.1	Description	
4.4.16.2.2	UC_24: PSTN-to-IMS call	
	est Descriptions	
4.5.1	General Capabilities	
4.5.1.1	SIP messages longer than 1 500 bytes	
4.5.1.2	ENUM Query - Functionality test	
4.5.2	Registration and De-registration	
4.5.2.1	First time registration in a visited IMS network	121
4.5.2.2	No response from first entry point on REGISTER without topology hiding	127
4.5.2.3	403 response to REGISTER from an un-trusted domain without topology hiding	130
4.5.2.4	Network initiated deregistration by the S-CSCF	131
4.5.2.5	Network initiated re-authentication by the S-CSCF	
4.5.3	Initial Dialog or Subsequent Procedures	
4.5.3.1	Initial INVITE Dialog Procedures	
4.5.3.1.1	Initial INVITE Request Procedures - Originating	
4.5.3.1.2	Dialogue Procedures with Roaming	
4.5.3.1.3	Subsequent Request Procedures - Originating Network	
4.5.3.1.4	Dialogue Procedures - Topology Hiding	
4.5.4	Messaging	
4.5.4.1	Messaging with ENUM lookup procedure	
4.5.4.2	Messaging with SIP URI public identities	
4.5.4.3	Messaging with TEL URI identities	
4.5.4.4	Messaging with TEL ON identities	
4.5.4.4		
	Messaging with receiving user not registered	
4.5.4.6	Messaging with receiving user barred	
4.5.5	Supplementary Services	
4.5.5.1	Supplementary Service HOLD with AS	
4.5.5.2	Supplementary Service HOLD with AS in roaming	
4.5.5.3	Supplementary Service OIP with AS	226

4.5.5.4	Supplementary Service OIP with AS in roaming	229
4.5.5.5	Supplementary Services OIR and ACR with AS	
4.5.5.6	Supplementary Services OIR and ACR with AS in roaming	234
4.5.5.7	Supplementary Service CFU with AS	237
4.5.5.8	Supplementary Service CFU with AS in roaming	240
4.5.5.9	Supplementary Services OIP and OIR with AS	243
4.5.5.10	Supplementary Services OIP and OIR with AS in roaming	246
4.5.5.11	Ad-hoc Conference Call service	250
4.5.6	Presence	254
4.5.7	IPTV	254
4.5.7.1	IPTV registration and Service Attachment. Push mode	254
4.5.7.2	IPTV registration and Service Attachment. Pull mode.	255
4.5.7.3	BC session	256
4.5.7.4	CoD session. Establishing content control channel and content delivery channels using RTSP	
	Method 1	258
4.5.7.5	CoD session. Establishing content control channel and content delivery channels using RTSP	
	Method 2	260
4.5.7.6	Request for Network PVR offline capture in home network	262
4.5.8	IMS-PSTN Interoperability	263
4.5.8.1	IMS-to-PSTN call	263
4.5.8.1.1	ENUM Query - IMS-to-PSTN call	263
4.5.8.1.2	Normal Call, PSTN user clears call	264
4.5.8.1.3	Normal Call, IMS user clears call	
4.5.8.1.4	Unsuccessful Call, PSTN user busy	269
4.5.8.1.5	IMS user holds/resumes call	271
4.5.8.1.6	PSTN user holds/resumes call	272
4.5.8.2	PSTN-to-IMS call	274
4.5.8.2.1	Normal Call, PSTN user clears call	274
4.5.8.2.2	Normal Call, IMS user clears call	
4.5.8.2.3	Unsuccessful Call, IMS user busy	280
4.5.8.2.4	IMS user holds/resumes call	282
4.5.8.2.5	PSTN user holds/resumes call	283
History		286

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Foreword

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

The present document is part 2 of a multi-part deliverable covering the IMS NNI Interoperability Test Specifications, as identified below:

Part 1: "Test purposes for IMS NNI Interoperability";

Part 2: "Test descriptions for IMS NNI Interoperability";

Part 3: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT)".

Introduction

The IP Multimedia core network Subsystem (IMS) is a key component in the ETSI NGN architecture. Each IMS consists of multiple functional entities and interfaces. The goal of this work is to provide the interoperability tests for standardized network to network interfaces (NNI) of the IMS core network that are based on SIP messages.

Test purposes defined in the present document have been developed based on the requirements stated in the 3GPP IMS Release 9 specification.

1 Scope

The present document specifies interoperability Test Descriptions (TDs) for Inter-IMS Network to Network Interface (II-NNI) interoperability testing for the IP Multimedia Call Control Protocol based on Stage 3 Session Initiation Protocol (SIP) and Session Description Protocol (SDP) standard, TS 124 229 [1]. Interconnection aspects between two different IM CN subsystems for end to end service interoperability are based on standard TS 129 165 [16]. 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.

For the assessment of IMS core network requirements related to the ISC interface parts of the supplementary services HOLD (see TS 124 410 [10]), CDIV (see TS 124 404 [11]), ACR-CB (see TS 124 411 [12]), and OIP/OIR (see TS 124 407 [13]) have been used.

The scope of these test descriptions is not to cover all requirements specified in TS 124 229 [1]. TDs have been only specified for requirements that are observable at the interface between two IMS core network implementations, i.e. IMS NNI.

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 134 229-1 [6].

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 (V9.5.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3 (3GPP TS 24.229 version 9.5.0 Release 9)".
[2]	ETSI TS 186 011-1 (V4.1.3): "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 134 229-1: "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 133 203: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; 3G security; Access security for IP-based services (3GPP TS 33.203 Release 8)".
- [8] IETF RFC 2617: "HTTP Authentication: Basic and Digest Access Authentication".
- [9] IETF RFC 3966: "The tel URI for Telephone Numbers".
- [10] ETSI TS 124 410: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); TISPAN; NGN Signalling Control Protocol; Communication HOLD (HOLD) PSTN/ISDN simulation services; Protocol specification (3GPP TS 24.410 Release 8)".
- [11] ETSI TS 124 404: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); TISPAN; PSTN/ISDN simulation services: Communication Diversion (CDIV); Protocol specification (3GPP TS 24.404 Release 7)".
- [12] ETSI TS 124 411: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); TISPAN; PSTN/ISDN simulation services: Anonymous Communication Rejection (ACR) and Communication Barring (CB); Protocol specification (3GPP TS 24.411 Release 7)".
- [13] ETSI TS 124 407: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); TISPAN; PSTN/ISDN simulation services; Originating Identification Presentation (OIP) and Originating Identification Restriction (OIR); Protocol specification (3GPP TS 24.407 Release 7)".
- [14] ETSI TS 183 063: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); IMS-based IPTV stage 3 specification".
- [15] ETSI TS 124 247: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Messaging service using the IP Multimedia (IM) Core Network (CN) subsystem; Stage 3 (3GPP TS 24.247 Release 9)".
- [16] 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 9.5.0 Release 9)".
- [17] ETSI TS 102 901: "IMS Network Testing (INT); IMS NNI Interoperability Test Specifications; IMS NNI interoperability test descriptions for RCS".
- [18] ETSI TS 129 163 (V9.4.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Interworking between the IP Multimedia (IM) Core Network (CN) subsystem and Circuit Switched (CS) networks (3GPP TS 29.163 version 9.4.0 Release 9)".

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.

- [i.1] ETSI TR 133 978: "Universal Mobile Telecommunications System (UMTS); Security aspects of early IP Multimedia Subsystem (IMS) (3GPP TR 33.978 version 7.0.0 Release 7)".
- [i.2] 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)".

[i.3] ETSI TR 184 008: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Infrastructure ENUM Options for a TISPAN IPX". [i.4]

IETF RFC 3761: "The E.164 to Uniform Resource Identifiers (URI); Dynamic Delegation

Discovery System (DDDS) Application (ENUM)".

GSMA PRD IR.67: "DNS/ENUM Guidelines for Service Providers & GRX/IPX Providers" [i.5]

ver.5.1.

[i.6] IETF RFC 3403: "Dynamic Delegation Discovery System (DDDS), Part Three: The Domain

Name System (DNS) Database".

3 **Abbreviations**

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

3GPP 3rd Generation Partnership Project **ACL Automatic Congestion Level** Address Complete Message **ACM**

ACR Anonymous Communication Rejection

ACR-CB Anonymous Communication Rejection - Communication Barring

Authentication and Key Agreement **AKA**

Application Level Gateway **ALG**

Answer Message **ANM**

(IMS) Application Server AS

BC**Broadcast** CB Call Barring Call DIVersion **CDIV** (Test) ConFiguration CF Call Forward Unconditional **CFU**

CFW Call FloW Core Network CN Content on Demand CoD **CPG** Call Progress Message CS Circuit Switched

CSCF Call Session Control Function

DB Enum database

Dynamic Host Configuration Protocol DHCP

Domain Name System DNS **ENUM** E.164 Number Mapping

Global System for Mobile Communications **GSM**

GSM Association **GSMA** Communication HOLD **HOLD** HSS Home Subscriber Server Initial Address Message **IAM**

IAM_A Not applicable

Interconnection Border Control Gateway **IBCF**

I-CSCF Interrogating CSCF Initial Filter Criteria **IFC** Not applicable II-NNI IP Multimedia IM

IMS IP Multimedia Subsystem Inter Operator Identifier IOI Internet Protocol IP

Internet Protocol security **IPsec**

IPTV IP Television

Not applicable, document reference IR

ISC IMS Service Control

ISDN Integrated Service Digital Network

ISDN User Part **ISUP**

IUT Implementation Under Test MF Media Function

MGCF Media Gateway Control Function

MGF Media Gateway Function

MRFC Multimedia Resource Function Controller MRFP Multimedia Resource Function Processor

MSRP Message Session Relay Protocol

MTP Message Transfer Part
NAPTR Naming Authority Pointer
NNI Network-to-Network Interface

N-PVR Network based Personal Video Recording

NS Name Server

OCB Outgoing Communication Barring
OIP Originating Identification Presentation
OIR Originating Identification Restriction

PCM Pulse Code Modulation

PCO Point of Control and Observation PCRF Policy and Charging Rules Function

P-CSCF Proxy CSCF

PO Point of Observation
PoI Point of Interconnection

PRACK Reliability of Provisional Responses
PRD Not applicable, document reference
PSTN Public Switched Telephone Network
PVR Personal video recorder services
RLC Release Complete Message
RTSP Real Time Streaming Protocol

SA Security Association SCF Session Control Function

S-CSCF Serving CSCF

SCTP Stream Control Transmission Protocol

SDF Service Discovery Function
SDP Session Description Protocol
SGF Signalling Gateway Function
SIP Session Initiation Protocol
SS Simulation Services

SS Simulation Services
SUT System Under Test

TCP Transmission Control Protocol

TD Test Description

TISPAN Telecommunications and Internet converged Services and Protocols for Advanced Networking

TN Telephone Number TP Test Purpose

TPLan Test Purpose Notation
TSS Test Suite Structure

TTL Time to live USE Case UC_2_I Not applicable

UDP User Datagram Protocol UE User Equipment

UE User Equipment
URI Uniform Record Identifier

VoIP Voice over Internet Protocol
XML eXtensible Markup Language

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 both basic call procedures such as call establishment and call release and a selection of the most common supplementary services.*

4.2 Test Prerequisites

4.2.1 IP Version

These test specifications are based on the use of IPv4 for SIP message transport throughout all IMS nodes as specified in TR 123 981 [i.2] but do not exclude the use of IPv6 in the case that all involved IMS nodes support this version of the IP protocol.

4.2.2 Authentication and Security

The current test specification supports as default full IMS TS 133 203 [7] 3GPP security. Non-compliance with full IMS security features defined in TS 133 203 [7] is expected to be a problem mainly at the UE side, because of the potential lack of support of the USIM/ISIM interface (especially in 2G-only devices) and of the potential inability to support IPsec on some UE platforms. For those reasons, fallback to early IMS TR 133 978 [i.1] and SIP Digest authentication without key agreement and null authentication may be used to achieve satisfactory test results. Tests should however be executed with full IMS security if all required IMS nodes support it.

4.2.3 Registration and Subscription

4.2.3.1 SIP Call Flow

This clause describes the registration call flow under the authentication and security scope described in clause 4.2.2.

4.2.3.1.1 Early IMS Registration and Subscription Call Flow

Early IMS security does not allow SIP requests to be protected using an IPsec Security Association (SA) because it does not perform a key agreement procedure. IPsec security associations are not set up between UE and P-CSCF, as they are in the full IMS security solution. For early IMS security, the expected registration and subscription sequence is:

Step	Direction	Message	Comment	
Step	UE IMS	Wessage	Comment	
1			The UE establishes an IP bearer as required by its	
			specific access network (optional).	
2	$\leftarrow \rightarrow$		P-CSCF address discovery using DHCP	
			procedures for IPv4 (optional).	
3	\rightarrow	REGISTER	The UE sends initial registration for IMS services.	
4	+	200 OK	The IMS responds with 200 OK.	
5	\rightarrow	SUBSCRIBE	The UE subscribes to its registration event	
			package.	ĘĘ
6	+	200 OK or 202 Accepted The IMS responds with 200 OK or 202 Accepted.		Unprotected
7	+	NOTIFY	The IMS sends initial NOTIFY for registration event	20
			package, containing full registration state	Ju
			information for the registered public user identity in	_ر
			the XML body.	
8	\rightarrow	200 OK	The UE responds with 200 OK.	

4.2.3.1.2 Full IMS Registration and Subscription Call Flow

For full IMS security, the expected registration and subscription sequence is:

Cton	ep Direction Message Comment						
Step	UE IM	S Wessage					
1			The UE establishes an IP bearer as required by its specific access network (optional).				
2	←→		P-CSCF address discovery using DHCP procedures for IPv4 (optional).				
3	\rightarrow	REGISTER	The UE sends initial registration for IMS services.	_			
4	+	401 Unauthorized	The IMS responds with a valid Digest AKA authentication challenge and a list of integrity and encryption algorithms supported by the network as defined in the IMS_AKA procedure of TS 133 203 [7].	Unprotected			
5	Upon receipt of 401 Unauthorized, the UE selective first integrity and encryption algorithm combination on the list received from the P-CS 401 Unauthorized which is also supported by the UE. If the P-CSCF did not include any confidentiality algorithm in 401 Unauthorized the UE shall select the NULL encryption algorithm UE then proceeds to establish two new particles. In the UE then proceeds to establish two new particles.						
6	→	REGISTER	The UE sends another REGISTER with authentication credentials over IPSEC security association SA1.	by SA1			
7	← 200 OK		← 200 OK		The IMS responds with 200 OK over the same IPSEC security association SA1.	Protected by SA1	
8	→	SUBSCRIBE	The UE subscribes to its registration event package over the IPSEC security association SA2.				
9	+	200 OK or 202 Accepted	The IMS responds with 200 OK or 202 Accepted over the IPSEC security association SA2.	SA2			
10	+	NOTIFY	The IMS sends initial NOTIFY for registration event package, containing full registration state information for the registered public user identity in the XML body, over the IPSEC security association SA2.	Protected by SA2			
11	→	200 OK	The UE responds with 200 OK over the IPSEC security association SA2.				

4.2.3.1.3 SIP Digest Registration and Subscription Call Flow

For SIP Digest authentication without key agreement and null authentication, the expected registration and subscription sequence is:

Step	Direction		Comment			
1			The UE establishes an IP bearer as required by its specific access network (optional).			
2	←→		P-CSCF address discovery using DHCP procedures for IPv4 (optional).			
3	\rightarrow	REGISTER	The UE sends initial registration for IMS services.			
4	← 401 Unauthorized		← 401 Unauthorized The IMS responds with a valid HTTP Digest authentication challenge as defined in RFC 2617 [8].			
5	→	REGISTER	The UE sends another REGISTER with authentication credentials.	Jnprotected		
6	← 200 OK The IMS responds with 200 OK.		The IMS responds with 200 OK.	je l		
7	\rightarrow	SUBSCRIBE	The UE subscribes to its registration event package.	20		
8			The IMS responds with 200 OK or 202 Accepted.	Jr I		
9	← NOTIFY The IMS sends initial NOTIFY for registration event package, containing full registration state information for the registered public user identity in the XML body					
10	\rightarrow	200 OK	The UE responds with 200 OK.			

4.2.4 Supported Options

4.2.4.1 Security

Support for security agreement is optional in case of Full IMS Reg. It shall only be used in case all IMS nodes support it

4.2.4.2 Signalling Compression

"No SigComp" is the default signalling configuration in all test descriptions. Tests may be executed with signalling compression if the required nodes support it.

4.2.5 Number Resolution

"ENUM (RFC 3761 [i.4]) is a capability that transforms E.164 numbers into domain names and then uses the DNS (Domain Name System) to discover NAPTR records that specify the services available for a specific domain name." (TR 184 008 [i.3]).

The test infrastructure focuses on the use of Infrastructure ENUM to map a telephone number into a SIP URI that could identify a specific point of interconnection (PoI) to that communication provider's network that could enable the originating party to establish communication with the associated terminating party either directly or through an IPX.

The Infrastructure ENUM platform has a tiered structure and provides authoritative, service specific information to the quering party. A combination of Tier 0, Tier 1 and Tier 2 registries enables global discovery of ENUM data.

When returning the SIP URI of an PoI the ENUM solution acts a hosted T2 ENUM registry for the number range holder. When returning a NS record the ENUM solution acts as either a Tier 0 or Tier 1 registry.

4.3 Test Infrastructure

In these clauses we define the involvement of the various IMS nodes specifically as they pertain to NNI testing. The configuration of the nodes is described. Points of control and observation are identified and static test configurations are described. The Mw interface or the Ic interface if topology hiding is required is the interface under observation for NNI interoperability testing.

4.3.1 Core IMS Nodes

The current testing scope includes IMS roaming and border control functionality. For IMS roaming, Mw reference point between IMS core in visited network (P-CSCF) and IMS core in home network will be monitored for testing purposes. For border control functionality, Mx reference point between IMS Core and IBCF, Ici reference point between an IBCF and another IBCF or I-CSCF belonging to a different IM CN subsystem network and Izi reference point between a TrGW and another TrGW or media handling node belonging to a different IM CN subsystem network will be monitored for testing purposes. For all test cases not requiring IMS roaming or border control functionality, P-CSCF, S-CSCF, I-CSCF, IBCF, and HSS are considered to be within a "black box" for testing purposes, i.e. the System Under Test (SUT). Interfaces within the IMS (excluding Mx reference point between IMS Core and IBCF when border control functionality is required) are considered internal and not observable for testing purposes.

4.3.1.1 P-CSCF

4.3.1.1.1 Relevant Interfaces

The P-CSCF constitutes the point of entry for UE signalling into the IMS core. The Gm interface between the P-CSCF and the UE is used as a point of control and observation (PCO) for NNI interoperability testing purposes. In the case of IMS roaming configurations the Mw reference point of the P-CSCF is exposed at the NNI and used there as a point of observation (PO).

4.3.1.1.2 Node Configuration

The P-CSCF should be configured to support the pre-requisites outlined in clause 4.2.

4.3.1.2 S-CSCF

4.3.1.2.1 Relevant Interfaces

The S-CSCF is the core IMS node delivering IMS services to subscribers. When no border control functionalities are applied, the Mw reference point between the S-CSCF and either I- or S-CSCF in another network domain is used as a PO against which NNI interoperability tests are validated. The Mw interfaces between I- and S-CSCFs within the same network are considered to be internal IMS interfaces. Although considered as internal and not explicitly involved in all NNI test configurations, it is recommended that these interface are exposed for troubleshooting purposes. When border control functionalities are applied, the Mx reference point between S-CSCF and IBCF within the same network domain, is used as a PO for NNI interoperability checks.

4.3.1.2.2 Node Configuration

The S-CSCF should be configured to support the pre-requisites outlined in clause 4.2. When applicable based on the specific configuration, the S-CSCF must be provisioned to support required Application Servers (AS) as trusted nodes.

4.3.1.3 I-CSCF

4.3.1.3.1 Relevant Interfaces

The I-CSCF is the contact point within an operator's network for all connections destined to a user of that network operator, or a roaming user currently located within that network operator's service area. When no border control functionalities are applied, the Mw reference point between the I-CSCF and an S-CSCF in another network domain is used as a PO against which NNI interoperability tests are validated. The Mw interfaces between I- and S-CSCFs within the same network are considered to be internal IMS interfaces. Although considered as internal and not explicitly involved in all NNI test configurations, it is recommended that these interface are exposed for troubleshooting purposes. When border control functionalities are applied, the Mx reference point between I-CSCF and IBCF within the same network domain, is used as a PO for NNI interoperability checks.

4.3.1.3.2 Node Configuration

The I-CSCF should be configured to support the pre-requisites outlined in clause 4.2.

4.3.1.4 **IBCF**

4.3.1.4.1 Relevant Interfaces

The IBCF is the core IMS node providing border control functionalities such as topology hiding, transport plane control, screening of SIP signalling or application level gateway (for instance enabling communication between IPv6 and IPv4 SIP applications). However, the IBCF can act also as a pass-through entity between adjacent IMS networks. The IcI reference point between the IBCF and either IBCF or I- or S-CSCF in another network domain is used as a PO against which NNI interoperability tests are validated.

4.3.1.4.2 Node Configuration

The IBCF should be configured to support the pre-requisites outlined in clause 4.2. The IBCF node will be present in all tests to be executed. In case the requirement to support topology hiding is not explicitly stated in the pre-conditions of a test description it shall be assumed that the IBCF does not apply this functionality. In case the requirement to support application level gateway (ALG) is not explicitly stated in the pre-conditions of a test description it shall be assumed that the IBCF does not apply this functionality.

4.3.1.5 HSS

4.3.1.5.1 Relevant Interfaces

The HSS constitutes the repository for IMS subscriber information. The Cx interface between the HSS and the S-CSCF and/or I-CSCF is considered an internal IMS interface.

4.3.1.5.2 **Node Configuration**

The HSS should be configured within each IMS participating in an interoperability test, i.e. IMS A as well as IMS B, to interact with CSCFs as required using DIAMETER Cx interfaces. Users should be provisioned to match the sample profiles listed in table 1. In addition, each IMS shall have its own unique domain. Also the phone numbers configured in the two IMSes participating in an interoperability test shall be unique, i.e. IMS A and IMS B shall have no phone numbers in common. All public identities belong to the same implicitly registered set.

Table 1: HSS sample user profiles

Private Identity	Public Identity 1 (SIP URI)	Public Identity 2 (Tel URI)	Default Public Identity	Filter criteria
userGEN_priv	userGEN	na	1	na
userSIP_priv	userSIP	e.g. tel:+330123402	1	na
userTEL_priv	userTEL	e.g. tel:+330123403	2	na
userNOAS_priv	userNOAS	na	1	contact AS on terminating INVITE SESSION_TERMINATED
userHOLD_priv	userHOLD	na	1	contact HOLD AS
userOIP_priv	userOIP	na	1	contact OIP AS
userOIR_priv	userOIR	na	1	contact OIR AS
userACR_priv	userACR	na	1	contact ACR AS
userCFU_priv	userCFU	na	1	contact CFU AS
userIPTV priv	userIPTV	na	1	Contact IPTV AS

Public user identity may take the form of SIP or TEL URIs (RFC 3966 [9]).

EXAMPLE 1: sip: userGEN@ims a.net.

EXAMPLE 2: tel: +330123402.

A private user identity may also take the form of-<imsi>@ims.<xxx>mnc.<yyy>.mcc.3gppnetwork.org.

EXAMPLE 3: 293410100367663@ims.041mnc.293.mcc.3gppnetwork.org.

4.3.1.6 MRFC

4.3.1.6.1 Relevant Interfaces

The Media Resource Function Controller (MRFC) is a signalling plane node that acts as a SIP User Agent to the S-CSCF, and which controls the MRFP across an H.248 interface. The Mr interface between the MRFC and the S-CSCF, the Cr/Sr interfaces to the AS and the Mp interface to the MRFP are considered internal IMS interfaces.

4.3.1.6.2 Node Configuration

The MRFC should be configured to support the pre-requisites outlined in clause 4.2. The need to activate the MRFC as part of an IMS core network depends highly on the test description to be executed.

4.3.1.7 MRFP

4.3.1.7.1 Relevant Interfaces

The Media Resource Function Processor (MRFP) is a media plane node that implements all media-related functions. The Mp interface between the MRFP and the MRFC is considered an internal IMS interface.

4.3.1.7.2 Node Configuration

The MRFP should be configured to support the pre-requisites outlined in clause 4.2. The need to activate the MRFP as part of an IMS core network depends highly on the test description to be executed.

4.3.1.8 MGCF

4.3.1.8.1 Relevant Interfaces

The Media Gateway Controller Function (MGCF) does call control protocol conversion between SIP and ISUP. It also controls the resources in a Media Gateway across an H.248 interface. The Mg reference point between the MGCF and an I-CSCF in the same network domain is used as a PO against which NNI interoperability tests are validated. The E1 reference point to the CS network is used to verify the codings of the ISUP messages.

4.3.1.8.2 Node Configuration

The MGCF should be configured to support the pre-requisites outlined in clause 4.2. The need to activate the MGCF as part of an IMS core network depends highly on the test description to be executed.

4.3.1.9 MGF

4.3.1.9.1 Relevant Interfaces

The Media Gateway Function (MGF) interfaces with the media plane of the CS network, by converting between RTP and PCM. It can also transcode when the codecs do not match. The reference points of the MGF with other entities are out of the scope of the test descriptions in the present document.

4.3.1.9.2 Node Configuration

The MGF should be configured to support the pre-requisites outlined in clause 4.2. The need to activate the MGF as part of an IMS core network depends highly on the test description to be executed.

4.3.1.10 SGF

4.3.1.10.1 Relevant Interfaces

The Signalling Gateway Function (SGF) interfaces with the signalling plane of the CS. It transforms lower layer protocols as Stream Control Transmission Protocol (SCTP) into Message Transfer Part (MTP) protocol), to pass ISDN User Part (ISUP) from the MGCF to the CS network.

4.3.1.10.2 Node Configuration

The SGF should be configured to support the pre-requisites outlined in clause 4.2. The need to activate the SGF as part of an IMS core network depends highly on the test description to be executed.

4.3.2 External IMS core Nodes

4.3.2.1 UE

4.3.2.1.1 Relevant Interfaces

The UE is considered to act as a stimulus node in this test specification. The Gm interface between the P-CSCF and the UE is used as a Point of Control and Observation (PCO) for NNI interoperability tests.

4.3.2.1.2 Node Configuration

The UE should be configured to support the pre-requisites outlined in clause 4.2. The test descriptions in the present document assume that a UE supports basic call and messaging functionality, target refresh based on UPDATE and on re-INVITE method, message transport via UDP and TCP, and the use of at least one of the supplementary services HOLD (see TS 124 410 [10]), CDIV (see TS 124 404 [11]), ACR-CB (see TS 124 411 [12]) or OIP/OIR (see TS 124 407 [13]). In the case that a UE does not meet one or more of these features, 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 features.

4.3.2.2 AS

4.3.2.2.1 Relevant Interfaces

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.

4.3.2.2.2 Node Configuration

The AS should be configured to support the pre-requisites outlined in clause 4.2. The test descriptions in the present document assume that an AS supports the use of the supplementary services HOLD (see TS 124 410 [10]), CDIV (see TS 124 404 [11]), ACR-CB (see TS 124 411 [12]), OIP/OIR (see TS 124 407 [13]), IPTV(see TS 183 063 [14]) or Conference (see TS 124 247 [15]). In the case that an AS does not support one or more of these supplementary 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 Supporting IMS Nodes

4.3.3.1 DNS

4.3.3.1.1 Relevant Interfaces

The Domain Name Service (DNS) is considered as a supporting entity in this test specification. It is assumed that each IMS has its own local DNS which is connected to the common interconnect DNS.

4.3.3.1.2 Node Configuration

The common DNS should be configured for appropriate resource record handling as required to support proper resolution of all SIP URIs in Request URIs and Route headers.

4.3.3.2 ENUM

When testing a combination of local and external registries can be used to simulate all functions of the Tier 0, Tier 1 and Tier 2 registries operation plus all national and international interconnect scenarios. It is assumed that each IMS core may access a local ENUM solution and an external ENUM solution with query capabilities or a combination of local and external solutions to allow retrieval of ENUM data.

4.3.3.2.1 Local ENUM Solution

Each IMS may access a local ENUM solution with query capabilities which allows retrieval of authoritative stored ENUM data (usually Tier 2 data) or authoritative cached ENUM data (any Tier).

4.3.3.2.2 Common ENUM Solution

An external ENUM registry is provided by the GSMA PRD IR.67 [i.5] to simulate a Tier 0 global root, national Tier 1 registries and off board Tier 2 registries. Depending on the scenario in simulation the registry allows to resolve a TN either directly with the SIP URI of the appropriate interconnection point or indirectly with a NS record of the destination operator. The NS record can then be used by the local ENUM solution to obtain a SIP URI. The test participants select the required features in order to implement particular simulation scenarios.

For the test participants the registry offers:

- an interface to manage user accounts;
- a provisioning interface for entering relevant information (E.164 number, SIP URI or NS record etc.) into the database; and
- a query interface accepting NAPTR queries and responding with NAPTR responses. As an example, the ENUM service should have an entry to map E.164 number (e.g. +33633348273) to the SIP URI of userSIP. Alternatively the response can also contain a NS record.

4.3.3.2.3 Node Configuration

The common ENUM solution should be configured to support a proper resolution of E.164 TNs into SIP URIs as defined in GSMA PRD IR.67 [i.5], clause 5.44 with reference to RFC 3761 [i.4] and RFC 3403 [i.6].

4.3.4 Test Configurations

The following architectural test configurations are referenced in the IMS NNI interoperability TDs in the present document. They are intended to give a general rather than a specific view of the required IMS core network SUT(s) connectivity and associated UE(s), AS(s), and DNS(s).

NOTE: Note that in the following figures observable interfaces are indicated as a solid line, non-observable interfaces indicated as dashed lines, and IBCFs are assumed to act in a "pass-through" mode if topology hiding is not required by a test description. In addition, local DNS servers are not shown.

Roaming Registration

CF_ROAM_REG **IMS A IMSB** FNUM HSS HSS DB Gm Мx lc Mx S-CSCF PCO PO PΟ РΟ I-CSCF

Precondition:

Different network operators performing origination and termination, UE_B roaming in visited network A (ROAM). UE_B not yet registered (REG), neither UE_A nor AS involved, a common interconnect ENUM DB and local ENUM is involved, IBCF is involved but no topology hiding performed.

Test configuration for:

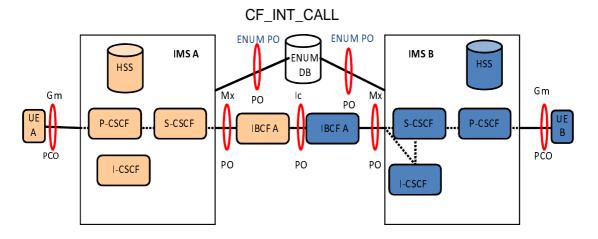
Registration requests and responses from UE_B

Example:

REGISTER prior to IMS VoIP voice call from UE_B

Figure 1: CF_ROAM_REG

Interworking Call



Precondition:

Different network operators performing origination and termination, both Ues or only UE_A in home networks (INT), both Ues registered, no AS, a common interconnect ENUM DB and local ENUM is involved, IBCF is involved, topology hiding may apply.

Test configuration for:

Requests and responses between UE_A and UE_B in call (CALL) and messaging scenarios. Unsuccessful initiall requests and responses from UE_A (when UE_B is nor registered)

Example:

Initial INVITE in IMS VoIP voice call from UE_A to UE_B

Figure 2: CF_INT_CALL

Roaming Call

CF_ROAM_CALL IMS A IMS B Gm ENUM HSS HSS UE DΒ Мx lc Мx S-CSCF PCO S-CSCF P-CSCF P-CSCF РΟ РΟ PΟ **I-CSCF I-CSCF** В PCO

Precondition:

Different network operators performing origination and termination, UE_B roaming (ROAM) via IMS_A, UE_A in home network, both Ues are registered, no AS, a common interconnect ENUM DB and local ENUM is involved, IBCF is involved, topology hiding may apply.

Test configuration for:

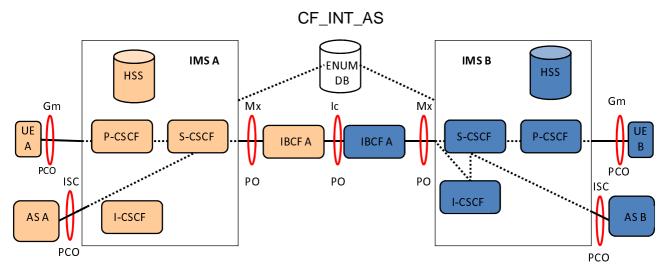
Requests and responses between UE_B and UE_A in call (CALL) and messaging scenarios

Example:

Initial INVITE in IMS VoIP voice call from UE_B to UE_A

Figure 3: CF_ROAM_CALL

Interworking Application Server



Precondition:

Different network operators performing origination and termination, UE_A and UE_B in home networks INT), both UEs registered, AS for UE_A and UE_B (AS), a common interconnect ENUM DB and local ENUM is involved, IBCF is involved, topology hiding may apply.

Test configuration for:

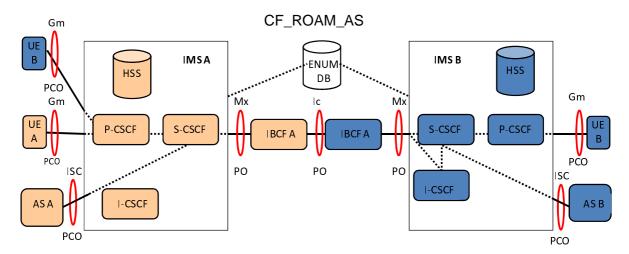
Requests and responses between ASes and UEs

Example:

Initial INVITE in IMS VoIP voice call unconditionally forwarded to UE_B by AS_A (CFU), AS_A acts as routing AS

Figure 4: CF_INT_AS

Roaming Application Server



Precondition:

Different network operators performing origination and termination, UE_B roaming (ROAM) via IMS_A, UE_A in home network, both Ues are registered, AS for UE_A and UE_B may be involved (AS), a common interconnect ENUM DB and local ENUM is involved, IBCF is involved, topology hiding may apply.

Test configuration for:

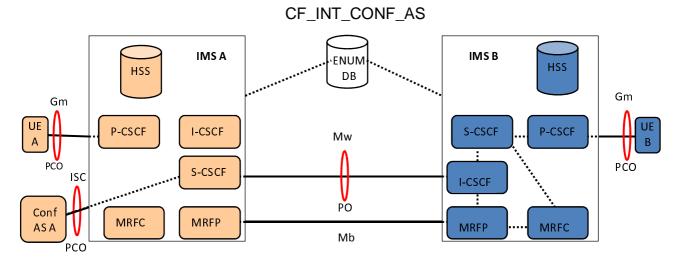
Requests and responses between AS_B and UEs

Example:

Initial INVITE in IMS VoIP voice call unconditionally forwarded to UE_B by AS_B (CFU), AS_B acts as routing AS

Figure 5: CF_ROAM_AS

Interworking Conference Server



Precondition:

Different network operators performing origination and termination, both Ues or only UE_A in home networks (INT), both UEs registered, CONF AS is involved in IMS_A, a common interconnect ENUM DB and local ENUM is involved, IMS_A and IMS_B both include MRFC and MRFP

Test configuration for:

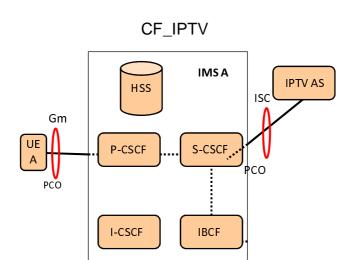
Requests and responses between UE_A and UE_B in an Ad-hoc Conference call (CONF_CALL)

Example:

Initial INVITE from UE_A to initiate an ad-hoc Conference call in IMS_A, and subsequent invitation to UE_B to join (via REFER method from UE_A)

Figure 6: CF_INT_CONF_CALL

IPTV



Precondition:

UE_A registered in home network, IPTV_AS involved

Test configuration for:

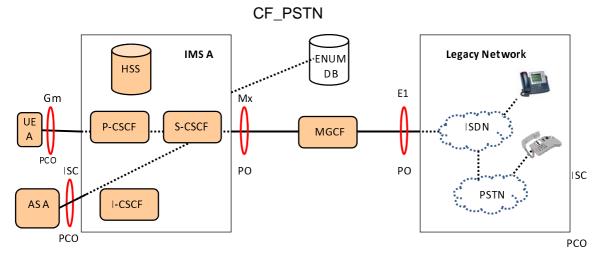
Requests and responses between UE_A and IPTV AS

Example:

Initial INVITE from UE_A to initiate an IPTV Broadcast session

Figure 7: CF_IPTV

PSTN Interworking



Precondition:

Different network operators performing origination and termination, UE_A and UE_B in home networks INT), both UEs registered, AS for UE_A and UE_B (AS), a common interconnect ENUM DB and local ENUM is involved, IBCF is involved, topology hiding may apply.

Test configuration for:

Requests and responses between ASes and UEs

Example:

Initial INVITE in IMS VoIP voice call unconditionally forwarded to UE_B by AS_A (CFU), AS_A acts as routing AS

Figure 8: CF_PSTN

4.4 Use Cases

Use cases are the basis for interoperability test descriptions. Each use case defines both a generic test sequence, i.e. a set of user stimuli and observations for any number of involved IMS external entities (IMS UE, DNS Server, and AS), and a monitor view of all the resulting messages exchanged at the outer IMS core network interfaces, i.e. a call flow for user, Gm, Mw, Ic, DNS, and ISC interfaces. The test sequence and call flow are correlated using grey shading.

For call and messaging related use cases presented in this clause that involve UE interaction it is assumed to follow the registration and subscription procedure described in clause 4.2.4 for each UE involved in the test. These procedures are not shown here to reduce the size of the call flows.

Test descriptions defined in clause 4.5 then reference and specialize one of the use cases presented in this clause, i.e. generic test sequence and call flow, according to the needs of the one or more test purposes which are associated with a test description.

4.4.1 IMS Registration in a Visited Network

4.4.1.1 Description

UE_B registers in a visiting network. The call flow path and node configuration for this use case corresponds to CF_ROAM_REG.

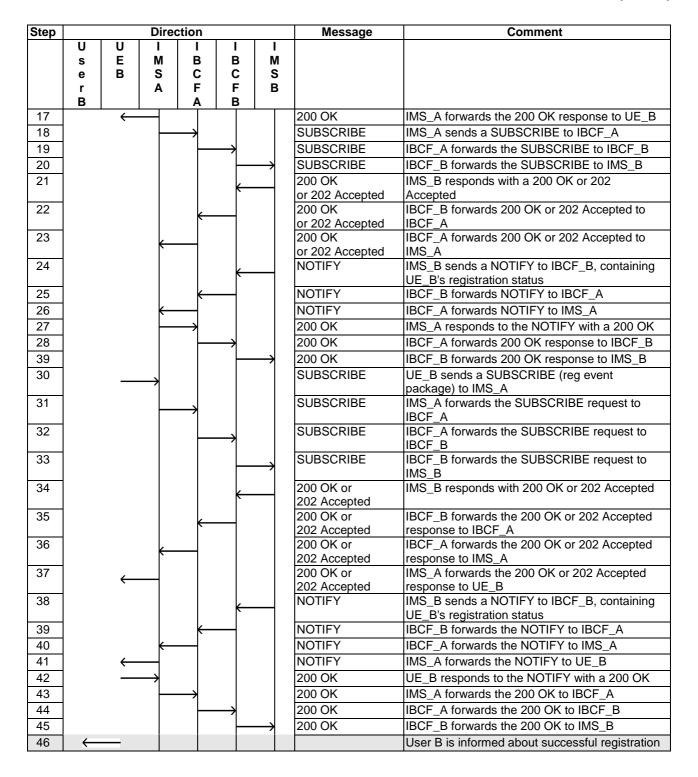
The test sequence typically associated with this use case when an established session is released is as follows (CFW step numbers refer the call flow step numbering).

Step	Action	CF_ROAM_REG
1	User B triggers registration to IMS B	Step 1
2	User B is informed about successful registration	Step 46

4.4.1.2 UC_01_R: SIP message flow for IMS registration with CF ROAM ROAM

The expected call flow sequence is:

Step	Direction						Message	Comment
	U s e r B	U E B	I M S A	I B C F A	I B C F B	M S B		
1	_	\rightarrow		•				User B triggers registration to IMS B
2			\rightarrow				REGISTER	UE_B sends a REGISTER to IMS_A
3			-	\longrightarrow			REGISTER	IMS_A forwards the REGISTER to IBCF_A
4					\longrightarrow		REGISTER	IBCF_A forwards the REGISTER to IBCF_B
5						\rightarrow	REGISTER	IBCF_B forwards the REGISTER to IMS_B
6					←		401 Unauthorized	IMS_B responds with 401 Unauthorized to IBCF_B
7				←			401 Unauthorized	IBCF_B forwards the 401 Unauthorized to IBCF_A
8			\leftarrow				401 Unauthorized	IBCF_A forwards the 401 Unauthorized to IMS_A
9		\leftarrow					401 Unauthorized	IMS_A forwards the 401 Unauthorized to UE_B
10		_	\rightarrow				REGISTER	UE_B sends the same REGISTER containing authentication challenge response to IMS_A
11			-	\longrightarrow			REGISTER	IMS_A forwards the REGISTER to IBCF A
12					\longrightarrow		REGISTER	IBCF_A forwards the REGISTER to IBCF B
13						\rightarrow	REGISTER	IBCF_B forwards the REGISTER to IMS B
14					←		200 OK	IMS_B responds with 200 OK
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



4.4.2 User-initiated VoIP call setup and release

4.4.2.1 Normal Call

4.4.2.1.1 Description

UE_A places an IMS VoIP call to UE_B. Once the media path is established, the originating user releases the call. The call flow path and node configuration for this use case corresponds to CF_INT_CALL in case of interworking and CF_ROAM_CALL in case of roaming.

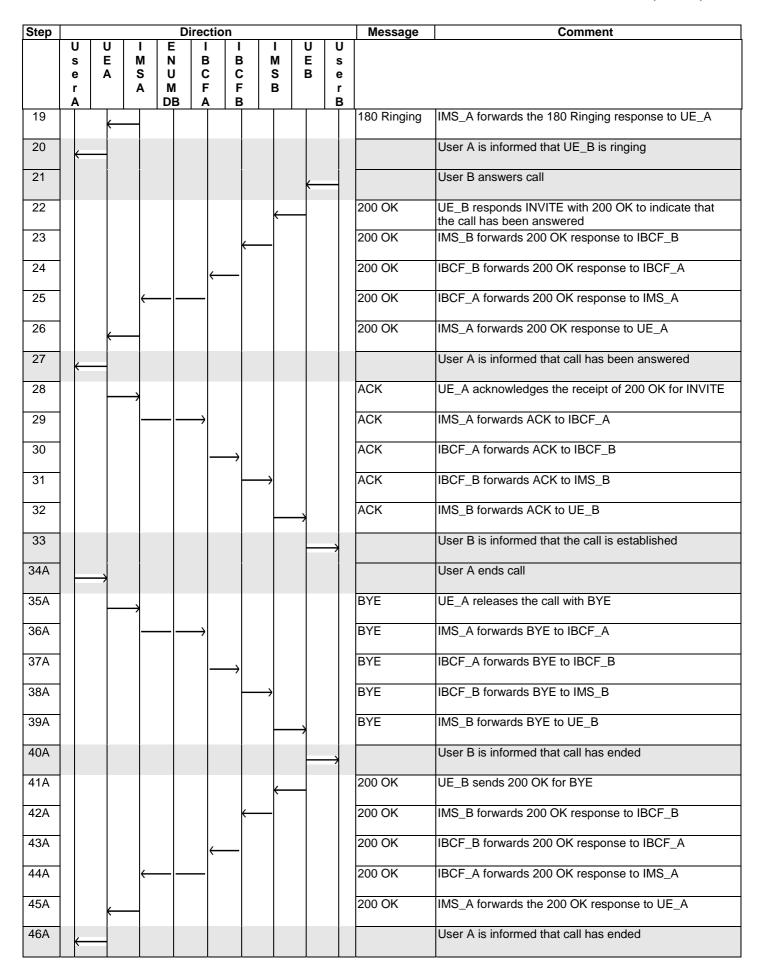
The test sequence typically associated with this use case is as follows (CFW step numbers refer the call flow step numbering).

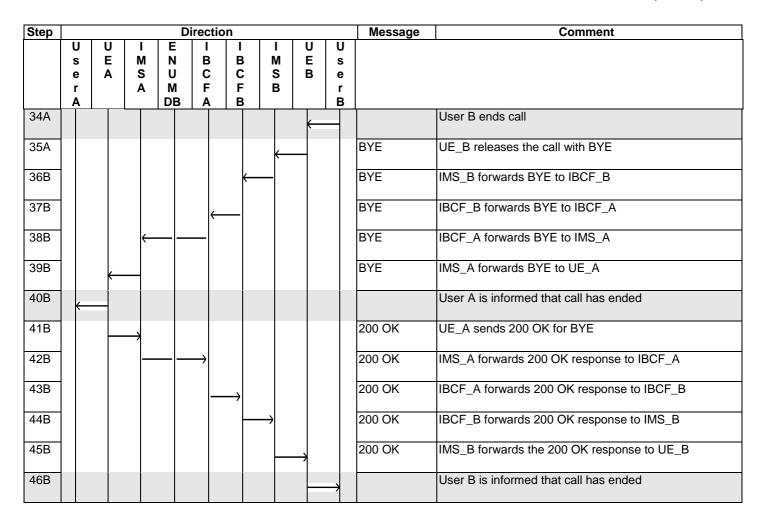
4.4.2.1.2 UC_02_I: SIP Call Flow "Normal Call" with CF_INT_CALL

The test sequence and expected call flow sequence when user A calls user B in an interworking scenario is:

Step	Action	CF_INT_CALL
1	User A calls User B	Step 1
2	User B is informed of incoming call of User A	Step 14
3	User A is informed that UE_B is ringing	Step 20
4	User B answers call	Step 21
5	User A is informed that call has been answered	Step 27
6	User B is informed that the call is established	Step 33
7A	User A ends call	Step 34A
7B	User B ends call	Step 34B
8A	User B is informed that call has ended	Step 40A
8B	User A is informed that call has ended	Step 40B
9A	User A is informed that call has ended	Step 46A
9B	User B is informed that call has ended	Step 46B

Step		Direction										Message	Comment
	U s e r A	U E A	M S A	E N U M DB	B C F A		С	I M S B	U E B	S e r B	!		
1		\rightarrow		•									User A calls User B
2			\rightarrow									INVITE	UE_A sends INVITE with the first SDP offer indicating all desired medias and codecs that UE_A supports
3		←	_									100 Trying	IMS_A responds with a 100 Trying provisional response
4			_	\longrightarrow								ENUM	IMS_A sends query to ENUM DB
5			\leftarrow									ENUM	ENUM DB sends response to IMS_A
6			-		\longrightarrow							INVITE	IMS_A forwards INVITE to IBCF_A
7			\leftarrow									100 Trying	IBCF_A responds with a 100 Trying provisional response
8							>					INVITE	IBCF_A forwards INVITE to IBCF_B
9							-					100 Trying	IBCF_B responds with a 100 Trying provisional response
10								•				INVITE	IBCF_B forwards INVITE to IMS_B
11								_				100 Trying	IMS_B responds with a 100 Trying provisional response
12									>			INVITE	IMS_B forwards INVITE to UE_B
13												100 Trying	UE_B optionally responds with a 100 Trying provisional response
14										\rightarrow			User B is informed of incoming call of User A
15								<u></u>				180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting
16								-				180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
17							-					180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
18			\leftarrow									180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A





4.4.2.1.3 UC_02_R: SIP Call Flow "Normal Call" with CF_ROAM_CALL

The expected call flow sequence when user A calls user B in a roaming scenario is:

Step				Di	rectio	n				Message	Comment
	U s e r A	U E A	M S A	E N U M DB	I B C F A	I B C F B	I M S B	U E B	U s e r B		
1	È	\rightarrow									User A calls User B
2			\rightarrow							INVITE	UE_A sends INVITE with the first SDP offer indicating all desired medias and codecs that
3		←								100 Trying	IMS_A responds with a 100 Trying provisional response
4				\rightarrow						ENUM	IMS_A sends query to ENUM DB
5			\leftarrow							ENUM	ENUM DB sends response to IMS_A
6					\rightarrow					INVITE	IMS_A forwards INVITE to IBCF_A
7			\leftarrow		_					100 Trying	IBCF_A responds with a 100 Trying provisional response
8						\rightarrow				INVITE	IBCF_A forwards INVITE to IBCF_B
9					←					100 Trying	IBCF_B responds with a 100 Trying provisional response

Step						ection	1				Message	Comment
	U s	U E	I M	1 E		I B	I B	I M	U E	U		
	е	Ā	S	; L	J	С	С	S	В	е		
	r A		A	, D		F A	F B	В		r B		
10								\rightarrow			INVITE	IBCF_B forwards INVITE to IMS_B
11							(100 Trying	IMS_B responds with a 100 Trying provisional response
12							←				INVITE	IMS_B forwards INVITE to IBCF_B
13								\rightarrow			100 Trying	IBCF_B responds with a 100 Trying provisional response
14						←					INVITE	IBCF_B forwards INVITE to IBCF_A
15							\rightarrow				100 Trying	IBCF_A responds with a 100 Trying provisional response
16			•	(_					INVITE	IBCF_A forwards INVITE to IMS_A
17			-			→					100 Trying	IMS_A responds with a 100 Trying provisional response
18			-			-			\rightarrow		INVITE	IMS_A forwards INVITE to UE_B
19			•	(100 Trying	UE_B optionally responds with a 100 Trying provisional response
20										\rightarrow		User B is informed of incoming call of User A
21			•	(180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting
22			-			→					180 Ringing	IMS_A forwards 180 Ringing response to IBCF_A
23							\rightarrow				180 Ringing	IBCF_A forwards 180 Ringing response to IBCF_B
24								\rightarrow			180 Ringing	IBCF_B forwards 180 Ringing response to IMS_B
25							\leftarrow				180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
26						\leftarrow					180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
27			•	(_					180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
28		(180 Ringing	IMS_A forwards the 180 Ringing response to UE_A
29	—											User A is informed that UE_A is ringing
30									(User B answers call
31			•	(200 OK	UE_B responds INVITE with 200 OK to indicate that the call has been answered
32			-			→					200 OK	IMS_A forwards 200 OK response to IBCF_A
33							\rightarrow				200 OK	IBCF_A forwards 200 OK response to IBCF_B
34								\rightarrow			200 OK	IBCF_B forwards 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

Step					 ctio	1				Message	Comment
	U s	U	I	1 E	I B	I B	I M	U E	U s		
	e r	Α	S		C F	C F	S B	В	e r		
38	A			D	A	В			В	200 OK	IMS_A forwards 200 OK response to UE_A
		+								200 OK	·
39	\leftarrow										User A is presented that call in process
40		-	\longrightarrow							ACK	UE_A acknowledges the receipt of 200 OK for INVITE
41			-		 →					ACK	IMS_A forwards ACK to IBCF_A
42						\rightarrow				ACK	IBCF_A forwards ACK to IBCF_B
43							\rightarrow			ACK	IBCF_B forwards ACK to IMS_B
44							_			ACK	IMS_B forwards ACK to IBCF_B
45					←					ACK	IBCF_B forwards ACK to IBCF_A
46			,		_					ACK	IBCF_A forwards ACK to IMS_A
47						_		\rightarrow		ACK	IMS_A forwards ACK to UE_B
48									\rightarrow		User B is informed that the call is in progress
49A		\rightarrow									User A ends call
50A			\longrightarrow							BYE	UE_A releases the call with BYE
51A			•)					BYE	IMS_A forwards BYE to IBCF_A
52A						\rightarrow				BYE	IBCF_A forwards BYE to IBCF_B
53A							\rightarrow			BYE	IBCF_B forwards BYE to IMS_B
54A						—				BYE	IMS_B forwards BYE to IBCF_B
55A					\leftarrow					BYE	IBCF_B forwards BYE to IBCF_A
56A			ļ		_					BYE	IBCF_A forwards BYE to IMS_A
57A								\rightarrow		BYE	IMS_A forwards BYE to UE_B
58A									\rightarrow		User B is informed that call has ended
59A										200 OK	UE_B sends 200 OK for BYE
60A					 >					200 OK	IMS_A forwards 200 OK response to IBCF_A
61A						\rightarrow				200 OK	IBCF_A forwards 200 OK response to IBCF_B
62A							\rightarrow			200 OK	IBCF_B forwards 200 OK response to IMS_B
63A						\leftarrow	\perp			200 OK	IMS_B forwards 200 OK response to IBCF_B
64A					\leftarrow	-				200 OK	IBCF_B forwards 200 OK response to IBCF_A
65A					-					200 OK	IBCF_A forwards 200 OK response to IMS_A

Step				D	irectio	n				Message	Comment
	U s e r A	U E A	M S A	E N U M DB	I B C F A	I B C F B	M S B	U E B	U s e r B		
66A		<u> </u>				J B			Б	200 OK	IMS_A forwards the 200 OK response to UE_A
67A	(User A is informed that call has ended
49B		\rightarrow									User A ends call
50B			\rightarrow							BYE	UE_A releases the call with BYE
51B					\rightarrow					BYE	IMS_A forwards BYE to IBCF_A
52B						\longrightarrow				BYE	IBCF_A forwards BYE to IBCF_B
53B							\rightarrow			BYE	IBCF_B forwards BYE to IMS_B
54B										BYE	IMS_B forwards BYE to IBCF_B
55B					←					BYE	IBCF_B forwards BYE to IBCF_A
56B			←							BYE	IBCF_A forwards BYE to IMS_A
57B				_				\rightarrow		BYE	IMS_A forwards BYE to UE_B
58B									\rightarrow		User B is informed that call has ended
59B			←							200 OK	UE_B sends 200 OK for BYE
60B					\rightarrow					200 OK	IMS_A forwards 200 OK response to IBCF_A
61B						\rightarrow				200 OK	IBCF_A forwards 200 OK response to IBCF_B
62B							\rightarrow			200 OK	IBCF_B forwards 200 OK response to IMS_B
63B						←				200 OK	IMS_B forwards 200 OK response to IBCF_B
64B					←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
65B			\leftarrow							200 OK	IBCF_A forwards 200 OK response to IMS_A
66B		—								200 OK	IMS_A forwards the 200 OK response to UE_A
67B	(User A is informed that call has ended

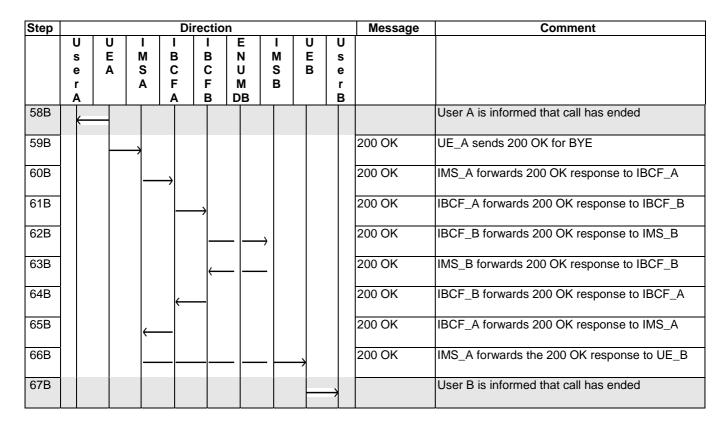
The test sequence and expected call flow sequence when user B calls user A in a roaming scenario is:

Step	Action	CF_ROAM_CALL
1	User B calls User A	Step 1
2	User A is informed of incoming call of User B	Step 20
3	User B is informed that UE_A is ringing	Step 29
4	User A answers call	Step 30
5	User B is informed that call has been answered	Step 39
6	User A is informed that the call is established	Step 48
7A	User A ends call	Step 49A
7B	User B ends call	Step 49B
8A	User B is informed that call has ended	Step 58A
8B	User A is informed that call has ended	Step 58B
9A	User A is informed that call has ended	Step 67A
9B	User B is informed that call has ended	Step 67B

Step				Di	rectio	n				Message	Comment
	U s e r A	UEA	I M S A	I B C F A	I B C F B	E N U M DB	M S B	U E B	U e r B		
1								(User B calls User A
2			←				_			INVITE	UE_B sends INVITE with the first SDP offer indicating all desired medias and codecs that
3					_	_	_	\rightarrow		100 Trying	IMS_A responds with a 100 Trying provisional response
4				\rightarrow						INVITE	IMS_A forwards INVITE to IBCF_A
5			\leftarrow	_						100 Trying	IBCF_A responds with a 100 Trying provisional response
6				_	\rightarrow					INVITE	IBCF_A forwards INVITE to IBCF_B
7				\leftarrow	-					100 Trying	IBCF_B responds with a 100 Trying provisional response
8					\leftarrow	_	_			INVITE	IBCF_B forwards INVITE to IMS_B
9					_	_	\rightarrow			100 Trying	IMS_B responds with a 100 Trying provisional response
10						\leftarrow	_			ENUM	IMS B sends query to ENUM DB
11							\rightarrow			ENUM	ENUM DB sends response to IMS B
12					\leftarrow	_	_			INVITE	IMS_B forwards INVITE to IBCF_B
13										100 Trying	IBCF_B responds with a 100 Trying provisional response
14				\leftarrow						INVITE	IBCF_B forwards INVITE to IBCF_A
15					\rightarrow					100 Trying	IBCF_A responds with a 100 Trying provisional response
16			←	_						INVITE	IBCF_A forwards INVITE to IMS_A
17				\rightarrow						100 Trying	IMS_A responds with a 100 Trying provisional response
18		—								INVITE	IMS_A forwards INVITE to UE_A
19			\rightarrow							100 Trying	UE_A optionally responds with a 100 Trying provisional response
20	(User A is informed of incoming call of User B

Step				Di	rectio					Message	Comment
	U	U E	I M	I B	I B	E N	I M	U E	U		
	s e	A	S	С	C	U	S	В	s e		
	r A		Α	F A	F B	M DB	В		r B		
21	Î		\rightarrow	<u> </u>						180 Ringing	UE_A responds to initial INVITE with 180 Ringing to indicate that it has started alerting
22				\rightarrow						180 Ringing	IMS_A forwards 180 Ringing response to IBCF_A
23					\rightarrow					180 Ringing	IBCF_A forwards 180 Ringing response to IBCF_B
24						- -	\rightarrow			180 Ringing	IBCF_B forwards 180 Ringing response to IMS_B
25					\leftarrow	_	_			180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
26				\leftarrow						180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
27			\leftarrow							180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
28								\rightarrow		180 Ringing	IMS_A forwards the 180 Ringing response to UE_B
29									\rightarrow		User B is informed that UE_A is ringing
30		\rightarrow									User A answers call
31			\rightarrow							200 OK	UE_A responds INVITE with 200 OK to indicate that the call has been answered
32				\rightarrow						200 OK	IMS_A forwards 200 OK response to IBCF_A
33				_	\rightarrow					200 OK	IBCF_A forwards 200 OK response to IBCF_B
34					_	- -	\rightarrow			200 OK	IBCF_B forwards 200 OK response to IMS_B
35					\leftarrow	_	_			200 OK	IMS_B forwards 200 OK response to IBCF_B
36				\leftarrow						200 OK	IBCF_B forwards 200 OK response to IBCF_A
37			\leftarrow							200 OK	IBCF_A forwards 200 OK response to IMS_A
38					_	- -	_ _	\rightarrow		200 OK	IMS_A forwards 200 OK response to UE_B
39									\rightarrow		User B is presented that call in process
40			←			_	_			ACK	UE_B acknowledges the receipt of 200 OK for INVITE
41				\rightarrow						ACK	IMS_A forwards ACK to IBCF_A
42				_	\rightarrow					ACK	IBCF_A forwards ACK to IBCF_B
43					-	_	\rightarrow			ACK	IBCF_B forwards ACK to IMS_B
44					\leftarrow	- -	_			ACK	IMS_B forwards ACK to IBCF_B
45				\leftarrow	-					ACK	IBCF_B forwards ACK to IBCF_A
46			\leftarrow	_						ACK	IBCF_A forwards ACK to IMS_A
47		K								ACK	IMS_A forwards ACK to UE_A
48	←										User A is informed that the call is in progress

Step				Di	rectio					Message	Comment
	U s	U	I M	I B	I B	E N	M	U E	U		
	e r	Α	S A	C F	C F	U M	S B	В	e r		
49A	A			A	В	DB			В		User A ends call
50A		\rightarrow								BYE	UE_A releases the call with BYE
			\rightarrow								
51A				\rightarrow						BYE	IMS_A forwards BYE to IBCF_A
52A					\rightarrow					BYE	IBCF_A forwards BYE to IBCF_B
53A						_ _	\rightarrow			BYE	IBCF_B forwards BYE to IMS_B
54A					←	_	_			BYE	IMS_B forwards BYE to IBCF_B
55A				\leftarrow						BYE	IBCF_B forwards BYE to IBCF_A
56A			←							BYE	IBCF_A forwards BYE to IMS_A
57A			<u> </u>					\rightarrow		BYE	IMS_A forwards BYE to UE_B
58A									\rightarrow		User B is informed that call has ended
59A			←				_			200 OK	UE_B sends 200 OK for BYE
60A				\rightarrow						200 OK	IMS_A forwards 200 OK response to IBCF_A
61A					\rightarrow					200 OK	IBCF_A forwards 200 OK response to IBCF_B
62A						_	\rightarrow			200 OK	IBCF_B forwards 200 OK response to IMS_B
63A					\leftarrow	_	_			200 OK	IMS_B forwards 200 OK response to IBCF_B
64A				\leftarrow						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	—										User A is informed that call has ended
49B								(User B ends call
50B			←			_ _				BYE	UE_B releases the call with BYE
51B				\rightarrow						BYE	IMS_A forwards BYE to IBCF_A
52B					\rightarrow					BYE	IBCF_A forwards BYE to IBCF_B
53B						_	\rightarrow			BYE	IBCF_B forwards BYE to IMS_B
54B					\leftarrow	_	_			BYE	IMS_B forwards BYE to IBCF_B
55B				\leftarrow						BYE	IBCF_B forwards BYE to IBCF_A
56B			←							BYE	IBCF_A forwards BYE to IMS_A
57B		—								BYE	IMS_A forwards BYE to UE_A



4.4.3 User-initiated call hold and resume

UE_A places an IMS VoIP call to UE_B. Once the media path is established:

- a) The originating user puts the call on hold, stopping the media stream. The originating user then resumes the call.
- b) The terminating user puts the call on hold, stopping the media stream. The terminating user then resumes the call.

The call flow path and node configuration for this use case corresponds to CF_INT_CALL in case of interworking and CF_ROAM_CALL in case of roaming.

Depending on the UE this feature may be implemented either using reINVITE or UPDATE where UPDATE is only an optional feature for the UE. However, an IMS shall be able to process UPDATE requests as they may be received when inter working with a PSTN.

4.4.3.1 User-initiated call hold and resume using reINVITE

4.4.3.1.1 Description

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

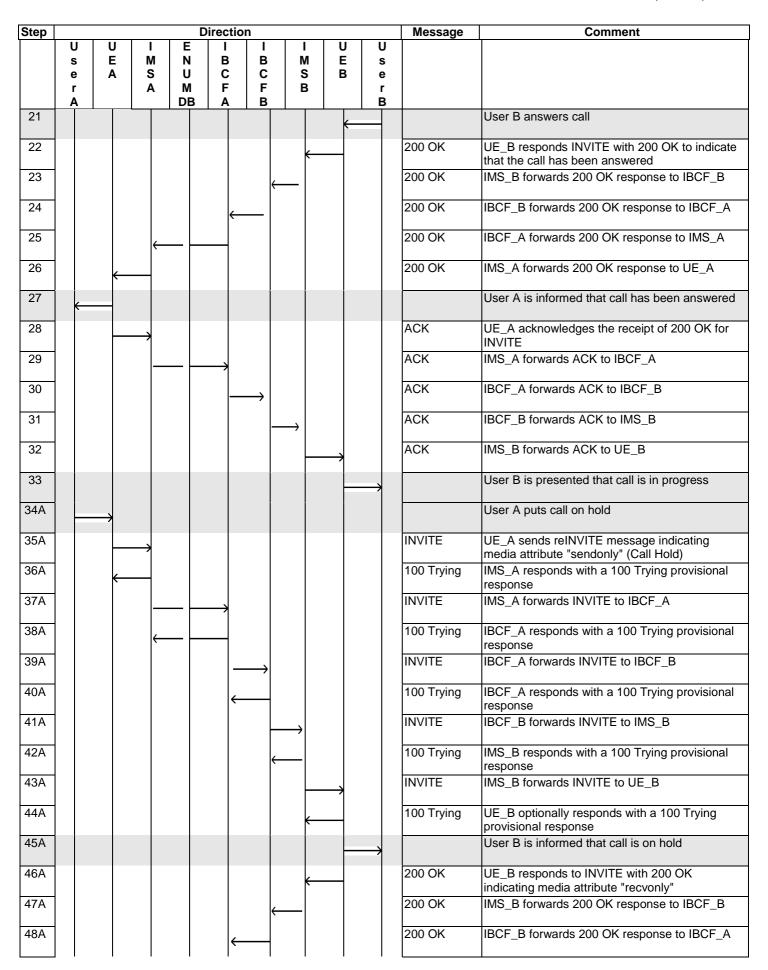
Step	Action	CF_INT_CALL	CF_ROAM_CALL
1	User A calls User B	1	1
2	User B is informed of incoming call of User A	14	20
3	User A is informed that UE_B is ringing	20	29
4	User B answers call	21	30
5	User A is informed that call has been answered	23	39
6	User B is presented that call is established	33	48
7A	User A puts call on hold	34A	49A
7B	User B puts call on hold	34B	49B
8A	User B is informed that call on hold	51A	66A
8B	User A is informed that call on hold	51B	66B

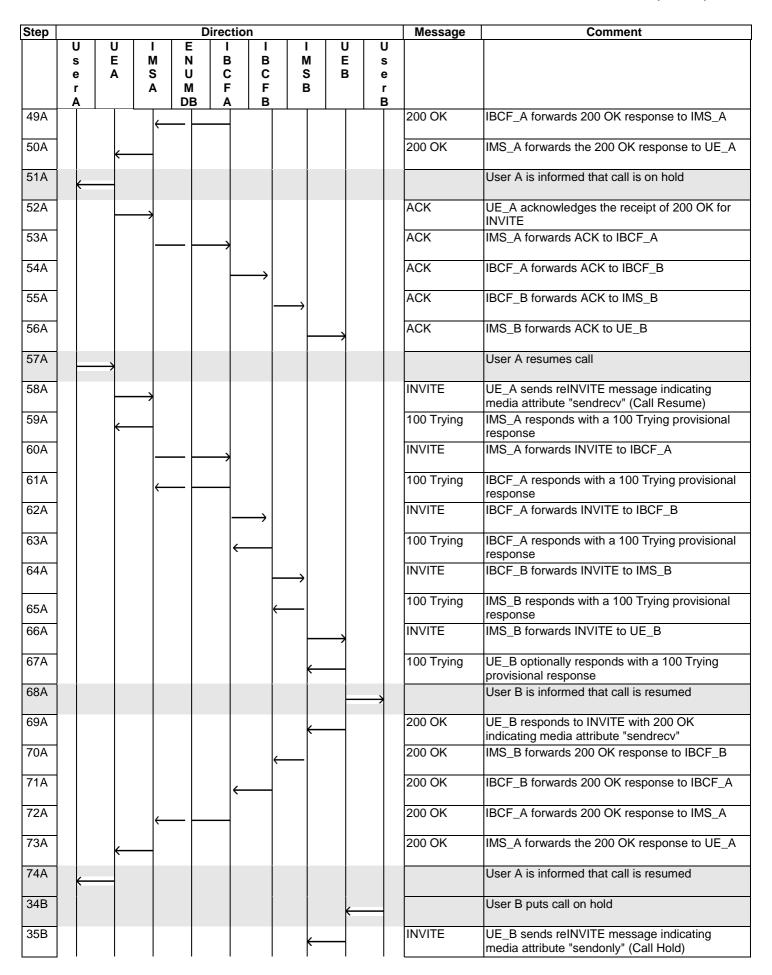
Step	Action	CF_INT_CALL	CF_ROAM_CALL
9A	User A resumes call	57A	84A
9B	User B resumes call	57B	84B
10A	User B is informed that call is resumed	68A	101A
10B	User A is informed that call is resumed	68B	101B
11A	User A is informed that call is resumed	74A	110A
11B	User B is informed that call is resumed	74B	110B
12	User A ends call	75	111
13	User B is informed that call has ended	81	119
14	User A is informed that call has ended	87	129

4.4.3.1.2 UC_03_I: SIP Call Flow "call hold and resume" using reINVITE with CF_INT_CALL

The expected call flow sequence is:

Step				г	Directi	on					Message	Comment
Otep	U s e r A	U E A	M S A	E N U M DB	I B C F A	I B C F	I M S B	1	U E B	U s e r B	message	
1		\rightarrow										User A calls User B
2			\longrightarrow								INVITE	UE_A sends INVITE with the first SDP offer indicating all desired medias and codecs that
3		(100 Trying	IMS_A responds with a 100 Trying provisional response
4				\rightarrow							ENUM	IMS_A sends query to ENUM DB
5			←	_							ENUM	ENUM DB sends response to IMS_A
6			_	_ -	\longrightarrow						INVITE	IMS_A forwards INVITE to IBCF_A
7			←	_							100 Trying	IBCF_A responds with a 100 Trying provisional response
8					_	\longrightarrow					INVITE	IBCF_A forwards INVITE to IBCF_B
9					+						100 Trying	IBCF_B responds with a 100 Trying provisional response
10							\longrightarrow				INVITE	IBCF_B forwards INVITE to IMS_B
11											100 Trying	IMS_B responds with a 100 Trying provisional response
12									>		INVITE	IMS_B forwards INVITE to UE_B
13							•	(-		100 Trying	UE_B optionally responds with a 100 Trying provisional response
14									H	\rightarrow		User B is informed of incoming call of User A
15									-		180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting
16							\longleftarrow				180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
17					(180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
18			←	_							180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
19		←									180 Ringing	IMS_A forwards the 180 Ringing response to UE_A
20	←											User A is informed that UE_B is ringing





Step				D	irectio	n				Message	Comment
	U s	U	I M	E N	I B	I B	I M	U E	U s		
	е	Ā	S	U	С	С	S	В	е		
	r A		Α	M DB	F A	F B	В		r B		
36B								\rightarrow		100 Trying	IMS_B responds with a 100 Trying provisional response
37B						←				INVITE	IMS_B forwards INVITE to IBCF_B
38B						_	\longrightarrow			100 Trying	IBCF_B responds with a 100 Trying provisional response
39B					_					INVITE	IBCF_B forwards INVITE to IBCF_A
40B					_	\longrightarrow				100 Trying	IBCF_A responds with a 100 Trying provisional response
41B			\leftarrow	_						INVITE	IBCF_A forwards INVITE to IMS_A
42B				_	\rightarrow					100 Trying	IMS_A responds with a 100 Trying provisional response
43B										INVITE	IMS_A forwards INVITE to UE_A
44B			→							100 Trying	UE_A optionally responds with a 100 Trying provisional response
45B	←										User A is informed that call is on hold
46B			\rightarrow							200 OK	UE_A responds to INVITE with 200 OK indicating media attribute "recvonly"
47B				_	\rightarrow					200 OK	IMS_A forwards 200 OK response to IBCF_A
48B					_	\longrightarrow				200 OK	IBCF_A forwards 200 OK response to IBCF_B
49B						_	\longrightarrow			200 OK	IBCF_B forwards 200 OK response to IMS_B
50B								\longrightarrow		200 OK	IMS_B forwards the 200 OK response to UE_B
51B									\rightarrow		User B is informed that call is on hold
52B							←			ACK	UE_B acknowledges the receipt of 200 OK for INVITE
53B						←				ACK	IMS_B forwards ACK to IBCF_B
54B					(ACK	IBCF_B forwards ACK to IBCF_B
55B			←	_						ACK	IBCF_B forwards ACK to IMS_A
56B										ACK	IMS_A forwards ACK to UE_A
57B								←			User B resumes call
58B							(INVITE	UE_B sends reINVITE message indicating media attribute "sendrecv" (Call Resume)
59B								\longrightarrow		100 Trying	IMS_B responds with a 100 Trying provisional response
60B						←				INVITE	IMS_B forwards INVITE to IBCF_B
61B						_	\longrightarrow			100 Trying	IBCF_B responds with a 100 Trying provisional
62B					←					INVITE	response IBCF_B forwards INVITE to IBCF_A
63B					`					100 Trying	IBCF_B responds with a 100 Trying provisional
						\longrightarrow					response

Step				Direction	n				Message	Comment
		U I E M	E N	I B	I B	I M	U E	U s		
		A S	U	С	С	S	В	e		
	r A	A	M DB	F	F B	В		r B		
64B		←							INVITE	IBCF_A forwards INVITE to IMS_A
65B		-		\longrightarrow					100 Trying	IMS_A responds with a 100 Trying provisional response
66B		<u> </u>							INVITE	IMS_A forwards INVITE to UE_A
67B									100 Trying	UE_A optionally responds with a 100 Trying provisional response
68B	(User A is informed that call is resumed
69B									200 OK	UE_A responds to INVITE with 200 OK indicating media attribute "sendrecv"
70B		_		\longrightarrow					200 OK	IMS_A forwards 200 OK response to IBCF_A
71B				_	\longrightarrow				200 OK	IBCF_A forwards 200 OK response to IBCF_B
72B						\longrightarrow			200 OK	IBCF_B forwards 200 OK response to IMS_B
73B							\rightarrow		200 OK	IMS_B forwards the 200 OK response to UE_B
74B										User B is informed that call is resumed
75		,								User A ends call
76		\longrightarrow							BYE	UE_A releases the call with BYE
77		_		\longrightarrow					BYE	IMS_A forwards BYE to IBCF_A
78					\rightarrow				BYE	IBCF_A forwards BYE to IBCF_B
79					_	\longrightarrow			BYE	IBCF_B forwards BYE to IMS_B
80							\rightarrow		BYE	IMS_B forwards BYE to UE_B
81										User B is informed that call has ended
82						\leftarrow			200 OK	UE_B sends 200 OK for BYE
83					←	_			200 OK	IMS_B forwards 200 OK response to IBCF_B
84				\leftarrow					200 OK	IBCF_B forwards 200 OK response to IBCF_A
85									200 OK	IBCF_A forwards 200 OK response to IMS_A
86									200 OK	IMS_A forwards the 200 OK response to UE_A
87	(User A is informed that call has ended

4.4.3.1.3 UC_03_R: SIP Call Flow "call hold and resume" using reINVITE with CF_ROAM_CALL

Step					Direc	tion					Message	Comment
	ν C	UE	I M	E		2	I B	I M	U E	U s		
	e	A	S	Ü		;	С	S	В	e		
	r A		Α	N Di			F B	В		r B		
1		\rightarrow			<u> </u>					Ĭ		User A calls User B
2			\rightarrow								INVITE	UE_A sends INVITE with the first SDP offer indicating all desired medias and codecs that
3		←									100 Trying	IMS_A responds with a 100 Trying provisional response
4			-	\longrightarrow							ENUM	IMS_A sends query to ENUM DB
5			+								ENUM	ENUM DB sends response to IMS_A
6			_		\longrightarrow						INVITE	IMS_A forwards INVITE to IBCF_A
7			+								100 Trying	IBCF_A responds with a 100 Trying provisional response
8							•				INVITE	IBCF_A forwards INVITE to IBCF_B
9							_				100 Trying	IBCF_B responds with a 100 Trying provisional response
10								*			INVITE	IBCF_B forwards INVITE to IMS_B
11							-				100 Trying	IMS_B responds with a 100 Trying provisional response
12											INVITE	IMS_B forwards INVITE to IBCF_B
13								>			100 Trying	IBCF_B responds with a 100 Trying provisional response
14						(INVITE	IBCF_B forwards INVITE to IBCF_A
15							→				100 Trying	IBCF_A responds with a 100 Trying provisional response
16			+								INVITE	IBCF_A forwards INVITE to IMS_A
17			_		\longrightarrow						100 Trying	IMS_A responds with a 100 Trying provisional response
18									-		INVITE	IMS_A 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 call of User A
21			(180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting
22					\longrightarrow						180 Ringing	IMS_A forwards 180 Ringing response to IBCF_A
23						,)				180 Ringing	IBCF_A forwards 180 Ringing response to IBCF_B
24								*			180 Ringing	IBCF_B forwards 180 Ringing response to IMS_B
25							\leftarrow	_			180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
26						(180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A

Step				Di	recti	on				Message	Comment
	Û	U E	I M	E N	В	I B	I M	U E	U		
	s e	Ā	S	Ü	C	C	S	В	s e		
	r A		Α	M DB	F	F B	В		r B		
27			\leftarrow	— —						180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
28		\leftarrow								180 Ringing	IMS_A forwards the 180 Ringing response to UE_A
29	—										User A is informed that UE_B is ringing
30								←			User B answers call
31			\leftarrow							200 OK	UE_B responds INVITE with 200 OK to indicate that the call has been answered
32					\rightarrow					200 OK	IMS_A forwards 200 OK response to IBCF_A
33						\longrightarrow				200 OK	IBCF_A forwards 200 OK response to IBCF_B
34							\rightarrow			200 OK	IBCF_B forwards 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		\leftarrow								200 OK	IMS_A forwards 200 OK response to UE_A
39	—										User A is informed that call has been answered
40			→							ACK	UE_A acknowledges the receipt of 200 OK for INVITE
41					\rightarrow					ACK	IMS_A forwards ACK to IBCF_A
42						\longrightarrow				ACK	IBCF_A forwards ACK to IBCF_B
43							\rightarrow			ACK	IBCF_B forwards ACK to IMS_B
44						←				ACK	IMS_B forwards ACK to IBCF_B
45					+					ACK	IBCF_B forwards ACK to IBCF_A
46			\leftarrow							ACK	IBCF_A forwards ACK to IMS_A
47								\rightarrow		ACK	IMS_A forwards ACK to UE_B
48									\rightarrow		User B is presented that call is in progress
49A		\rightarrow									User A puts call on hold
50A			4							INVITE	UE_A sends reINVITE message indicating media attribute "sendonly" (Call Hold)
51A		—	\dashv							100 Trying	IMS_A responds with a 100 Trying provisional response
52A					\rightarrow					INVITE	IMS_A forwards INVITE to IBCF_A
53A			\leftarrow	_	_					100 Trying	IBCF_A responds with a 100 Trying provisional response
54A					-	\longrightarrow				INVITE	IBCF_A forwards INVITE to IBCF_B

Step					Direc	tion					Message	Comment
	σ C	υE	I M	EN	E		В –	I M	U	U		
	е	Ā	S	U	(;	С	S	В	е		
	r A		Α	M DB	F		F B	В		r B		
55A											100 Trying	IBCF_B responds with a 100 Trying provisional response
56A								\rightarrow			INVITE	IBCF_B forwards INVITE to IMS_B
57A							—				100 Trying	IMS_B responds with a 100 Trying provisional response
58A							—				INVITE	IMS_B forwards INVITE to IBCF_B
59A								\rightarrow			100 Trying	IBCF_B responds with a 100 Trying provisional response
60A						\leftarrow					INVITE	IBCF_B forwards INVITE to IBCF_A
61A							\rightarrow				100 Trying	IBCF_A responds with a 100 Trying provisional response
62A			←								INVITE	IBCF_A forwards INVITE to IMS_A
63A					\longrightarrow						100 Trying	IMS_A responds with a 100 Trying provisional response
64A									\rightarrow		INVITE	IMS_A forwards INVITE to UE_B
65A			\leftarrow								100 Trying	UE_B optionally responds with a 100 Trying provisional response
66A										\rightarrow		User B is informed that call is on hold
67A			←				+		-		200 OK	UE_B responds to INVITE with 200 OK indicating attribute "recvonly" inactive
68A					\longrightarrow						200 OK	IMS_A forwards 200 OK response to IBCF_A
69A)				200 OK	IBCF_A forwards 200 OK response to IBCF_B
70A								\rightarrow			200 OK	IBCF_B forwards 200 OK response to IMS_B
71A							—				200 OK	IMS_B forwards 200 OK response to IBCF_B
72A						(_				200 OK	IBCF_B forwards 200 OK response to IBCF_A
73A			←								200 OK	IBCF_A forwards 200 OK response to IMS_A
74A		—									200 OK	IMS_A forwards 200 OK response to UE_A
75A			\rightarrow								ACK	UE_A acknowledges the receipt of 200 OK for INVITE
76A			_		\longrightarrow						ACK	IMS_A forwards ACK to IBCF_A
77A							\rightarrow				ACK	IBCF_A forwards ACK to IBCF_B
78A								\rightarrow			ACK	IBCF_B forwards ACK to IMS_B
79A							\leftarrow	_			ACK	IMS_B forwards ACK to IBCF_B
80A							_				ACK	IBCF_B forwards ACK to IBCF_A
81A			\leftarrow	-							ACK	IBCF_A forwards ACK to IMS_A
82A									\rightarrow		ACK	IMS_A forwards ACK to UE_B

Step					irecti	on				Message	Comment
	U s	U	I M	E N	I B	I B	I M	U E	U		
	е	Ā	S	U	С	С	S	В	е		
	r A		A	M DB	F	F B	В		r B		
83A	\leftarrow										User A is informed that call is on hold
84A		\rightarrow									User A resumes call
85A			\rightarrow							INVITE	UE_A sends reINVITE message indicating media attribute "sendrecv" (Call Resume)
86A		←								100 Trying	IMS_A responds with a 100 Trying provisional response
87A					\rightarrow					INVITE	IMS_A forwards INVITE to IBCF_A
88A			←							100 Trying	IBCF_A responds with a 100 Trying provisional response
89A						\longrightarrow				INVITE	IBCF_A forwards INVITE to IBCF_B
90A					(100 Trying	IBCF_B responds with a 100 Trying provisional response
91A							\rightarrow			INVITE	IBCF_B forwards INVITE to IMS_B
92A						(100 Trying	IMS_B responds with a 100 Trying provisional response
93A						(INVITE	IMS_B forwards INVITE to IBCF_B
94A							\rightarrow			100 Trying	IBCF_B responds with a 100 Trying provisional response
95A					(INVITE	IBCF_B forwards INVITE to IBCF_A
96A						\longrightarrow				100 Trying	IBCF_A responds with a 100 Trying provisional response
97A			←	_ _						INVITE	IBCF_A forwards INVITE to IMS_A
98A					\rightarrow					100 Trying	IMS_A responds with a 100 Trying provisional response
99A								\rightarrow		INVITE	IMS_A forwards INVITE to UE_B
100 A			←							100 Trying	UE_B optionally responds with a 100 Trying provisional response
101 A									\rightarrow		User B is informed that call is resumed
102 A			←							200 OK	UE_B responds to INVITE with 200 OK indicating media attribute "sendrecv"
103 A			_	_ _	\longrightarrow					200 OK	IMS_A forwards 200 OK response to IBCF_A
104 A						\longrightarrow				200 OK	IBCF_A forwards 200 OK response to IBCF_B
105 A							\rightarrow			200 OK	IBCF_B forwards 200 OK response to IMS_B
106 A						←				200 OK	IMS_B forwards 200 OK response to IBCF_B
107 A					←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
108 A			←		_					200 OK	IBCF_A forwards 200 OK response to IMS_A
109 A		(200 OK	IMS_A forwards the 200 OK response to UE_A
110 A	←										User B is informed that call has ended

Step					Direc	tion)				Message	Comment
	U s	U E	I M	E		 	I B	I M	U	U		
	е	Ā	S	U	(;	С	S	В	e		
	r A		Α	M DB	F		F B	В		r B		
49B									←			User B puts call on hold
50B			\leftarrow						-		INVITE	UE_B sends reINVITE message indicating media attribute "sendonly" (Call Hold)
51B									\rightarrow		100 Trying	IMS_A responds with a 100 Trying provisional response
52B					\longrightarrow						INVITE	IMS_A forwards INVITE to IBCF_A
53B			\leftarrow								100 Trying	IBCF_A responds with a 100 Trying provisional response
54B							\rightarrow				INVITE	IBCF_A forwards INVITE to IBCF_B
55B											100 Trying	IBCF_B responds with a 100 Trying provisional response
56B								→			INVITE	IBCF_B forwards INVITE to IMS_B
57B							—				100 Trying	IMS_B responds with a 100 Trying provisional response
58B							—				INVITE	IMS_B forwards INVITE to IBCF_B
59B								\rightarrow			100 Trying	IBCF_B responds with a 100 Trying provisional response
60B											INVITE	IBCF_B forwards INVITE to IBCF_A
61B							\rightarrow				100 Trying	IBCF_A responds with a 100 Trying provisional response
62B			\leftarrow								INVITE	IBCF_A forwards INVITE to IMS_A
63B				_	\longrightarrow						100 Trying	IMS_A responds with a 100 Trying provisional response
64B		\leftarrow									INVITE	IMS_A forwards INVITE to UE_A
65B			\rightarrow								100 Trying	UE_A optionally responds with a 100 Trying provisional response
66B	←											User A is informed that call is on hold
67B			\rightarrow								200 OK	UE_A responds to INVITE with 200 OK indicating attribute "recvonly" inactive
68B					\longrightarrow						200 OK	IMS_A forwards 200 OK response to IBCF_A
69B							\rightarrow				200 OK	IBCF_A forwards 200 OK response to IBCF_B
70B								\rightarrow			200 OK	IBCF_B forwards 200 OK response to IMS_B
71B							\leftarrow				200 OK	IMS_B forwards 200 OK response to IBCF_B
72B							_				200 OK	IBCF_B forwards 200 OK response to IBCF_A
73B			\leftarrow	_ -							200 OK	IBCF_A forwards 200 OK response to IMS_A
74B							-		\rightarrow		200 OK	IMS_A forwards 200 OK response to UE_B
75B			\leftarrow						\dashv		ACK	UE_B acknowledges the receipt of 200 OK for INVITE
76B					\longrightarrow						ACK	IMS_A forwards ACK to IBCF_A

Step					Dire	ction					Message	Comment
	U s	U E	I M	E N	١,	I B	I B	I M	U E	U s		
	е	Ā	S	U	(C	С	S	В	е		
	r A		A	M DB		F A	F B	В		r B		
77B					•		\rightarrow				ACK	IBCF_A forwards ACK to IBCF_B
78B								\rightarrow			ACK	IBCF_B forwards ACK to IMS_B
79B							\leftarrow				ACK	IMS_B forwards ACK to IBCF_B
80B						-	_				ACK	IBCF_B forwards ACK to IBCF_A
81B											ACK	IBCF_A forwards ACK to IMS_A
82B		(ACK	IMS_A forwards ACK to UE_A
83B	←											User A is informed that call is on hold
84B									—			User B resumes call
85B			←	_							INVITE	UE_B sends reINVITE message indicating media attribute "sendrecv" (Call Resume)
86B			_						\rightarrow		100 Trying	IMS_A responds with a 100 Trying provisional response
87B											INVITE	IMS_A forwards INVITE to IBCF_A
88B			(100 Trying	IBCF_A responds with a 100 Trying provisional response
89B							\rightarrow				INVITE	IBCF_A forwards INVITE to IBCF_B
90B						\leftarrow					100 Trying	IBCF_B responds with a 100 Trying provisional response
91B								\rightarrow			INVITE	IBCF_B forwards INVITE to IMS_B
92B							\leftarrow				100 Trying	IMS_B responds with a 100 Trying provisional response
93B							\leftarrow				INVITE	IMS_B forwards INVITE to IBCF_B
94B								\rightarrow			100 Trying	IBCF_B responds with a 100 Trying provisional response
95B											INVITE	IBCF_B forwards INVITE to IBCF_A
96B							\rightarrow				100 Trying	IBCF_A responds with a 100 Trying provisional response
97B			(INVITE	IBCF_A forwards INVITE to IMS_A
98B			_								100 Trying	IMS_A responds with a 100 Trying provisional response
99B		K									INVITE	IMS_A forwards INVITE to UE_A
100 B			\rightarrow								100 Trying	UE_A optionally responds with a 100 Trying provisional response
101 B												User A is informed that call is resumed
102 B			\rightarrow								200 OK	UE_A responds to INVITE with 200 OK indicating media attribute "sendrecv"
103 B			_								200 OK	IMS_A forwards 200 OK response to IBCF_A
104 B							\rightarrow				200 OK	IBCF_A forwards 200 OK response to IBCF_B

Step					Dire	ction					Message	Comment
	U s	U E	I	I E		I B	I B	I M	U E	U		
	е	Ā	S	: L	J	C F	C F	S	В	е		
	r A		Ļ	D		Ā	В	Ь		r B		
105 B								\rightarrow			200 OK	IBCF_B forwards 200 OK response to IMS_B
106 B							\leftarrow				200 OK	IMS_B forwards 200 OK response to IBCF_B
107 B						\leftarrow	_				200 OK	IBCF_B forwards 200 OK response to IBCF_A
108 B						-					200 OK	IBCF_A forwards 200 OK response to IMS_A
109 B									\rightarrow		200 OK	IMS_A forwards the 200 OK response to UE_B
110 B									H	\rightarrow		User B is informed that call is resumed
111		\rightarrow										User A ends call
112			\rightarrow								BYE	UE_A releases the call with BYE
113			-			>					BYE	IMS_A forwards BYE to IBCF_A
114							\rightarrow				BYE	IBCF_A forwards BYE to IBCF_B
115								\rightarrow			BYE	IBCF_B forwards BYE to IMS_B
116							—				BYE	IMS_B forwards BYE to IBCF_B
117						←					BYE	IBCF_B forwards BYE to IBCF_A
118			•	(-					BYE	IBCF_A forwards BYE to IMS_A
119			-						\rightarrow		BYE	IMS_A forwards BYE to UE_B
120										\rightarrow		User B is informed that call has ended
121			•	<u> </u>							200 OK	UE_B sends 200 OK for BYE
122			-			>					200 OK	IMS_A forwards the 200 OK response to IBCF_A
123							\rightarrow				200 OK	IBCF_A forwards 200 OK response to IBCF_B
124								\rightarrow			200 OK	IBCF_B forwards 200 OK response to IMS_B
125		\top									200 OK	IMS_B forwards 200 OK response to IBCF_B
126						←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
127			•	(-					200 OK	IBCF_A forwards 200 OK response to IMS_A
128		-									200 OK	IMS_A forwards the 200 OK response to UE_A
129	(User A is informed that call has ended

4.4.3.2 User-initiated call hold and resume using UPDATE

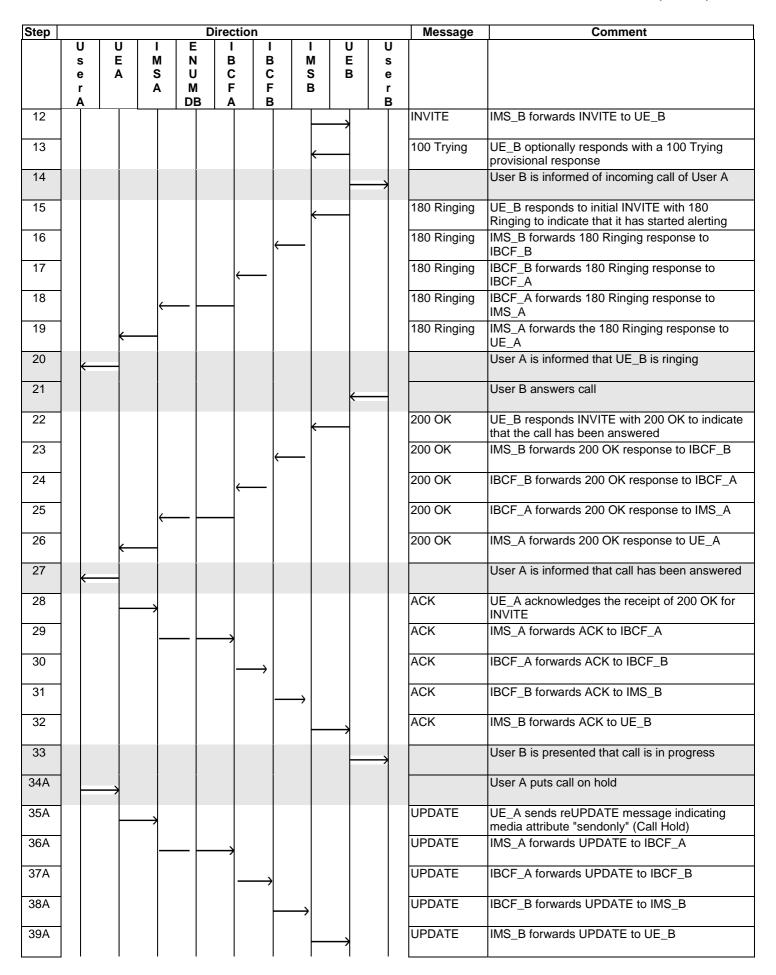
4.4.3.2.1 Description

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

Step	Action	CF_INT_CALL	CF_ROAM_CALL
1	User A calls User B	1	1
2	User B is informed of incoming call of User A	14	20
3	User A is informed that UE_B is ringing	20	29
4	User B answers call	21	30
5	User A is informed that call has been answered	27	39
6	User B is informed that call is established	29	48
7A	User A puts call on hold	34A	49A
7B	User B puts call on hold	34B	49B
8A	User B is informed that call on hold	40A	58A
8B	User A is informed that call on hold	40B	58B
9A	User A resumes call	52A	68A
9B	User B resumes call	52B	68B
10A	User B is informed that call is resumed	58A	77A
10B	User A is informed that call is resumed	58B	77B
11A	User A is informed that call is resumed	64A	86A
11	User A is informed that call is resumed	64B	86B
12	User A ends call	65	87
13	User B is informed that call has ended	71	96
14	User A is informed that call has ended	77	105

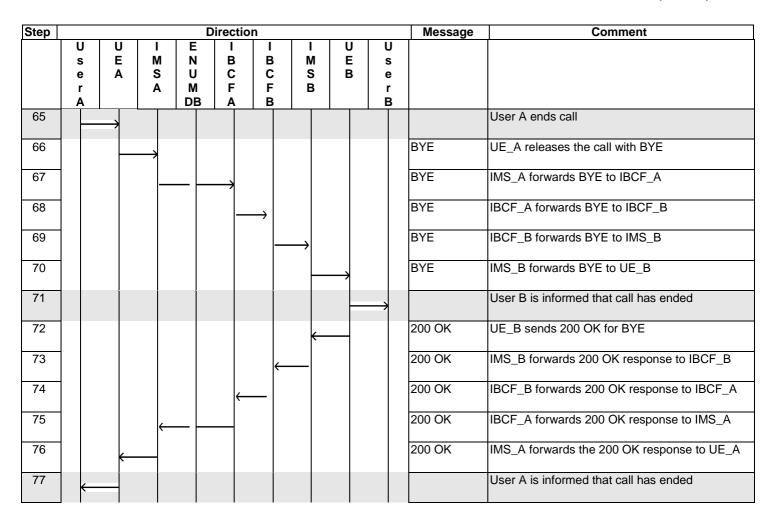
4.4.3.2.2 UC_04_I: SIP Call Flow "call hold and resume" using UPDATE with CF_INT_CALL

Step				D	irectio	n				Message	Comment
	U s e r A	U E A	I M S A	E N U M DB	I B C F	B C F B	M S B	U E B	U s e r B		
1		-									User A calls User B
2			\rightarrow							INVITE	UE_A sends INVITE with the first SDP offer indicating all desired medias and codecs that
3		←								100 Trying	IMS_A responds with a 100 Trying provisional response
4				\rightarrow						ENUM	IMS_A sends query to ENUM DB
5			\leftarrow							ENUM	ENUM DB sends response to IMS_A
6					\rightarrow					INVITE	IMS_A forwards INVITE to IBCF_A
7			\leftarrow							100 Trying	IBCF_A responds with a 100 Trying provisional response
8						\rightarrow				INVITE	IBCF_A forwards INVITE to IBCF_B
9					\leftarrow	_				100 Trying	IBCF_B responds with a 100 Trying provisional response
10							\rightarrow			INVITE	IBCF_B forwards INVITE to IMS_B
11						\leftarrow	_			100 Trying	IMS_B responds with a 100 Trying provisional response



Step					Direc	tion		_			Message	Comment
	U		J I	I E		I B	. I		U E	U s		
	e r		A 5		ı c	; c	: 5		В	e r		
40.4	A			DI			_			В		Ligar D in informed that call in an hald
40A)		User B is informed that call is on hold
41A								(200 OK	UE_B responds to UPDATE with 200 OK indicating media attribute "recvonly"
42A							\longleftarrow				200 OK	IMS_B forwards 200 OK response to IBCF_B
43A						←—					200 OK	IBCF_B forwards 200 OK response to IBCF_A
44A											200 OK	IBCF_A forwards 200 OK response to IMS_A
45A											200 OK	IMS_A forwards the 200 OK response to UE_A
46A												User A resumes call
47A											UPDATE	UE_A sends UPDATE message indicating media attribute "sendrecv" (Call Resume)
48A											UPDATE	IMS_A forwards UPDATE to IBCF_A
49A											UPDATE	IBCF_A forwards UPDATE to IBCF_B
50A							\longrightarrow				UPDATE	IBCF_B forwards UPDATE to IMS_B
51A									>		UPDATE	IMS_B forwards UPDATE to UE_B
52A										>		User B is informed that call is resumed
53A									-		200 OK	UE_B responds to UPDATE with 200 OK indicating media attribute "sendrecv"
54A							\longleftarrow				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 the 200 OK response to UE_A
58A												User A is informed that call is resumed
34B												User B puts call on hold
35B											UPDATE	UE_B sends UPDATE message indicating media attribute "sendonly" (Call Hold)
36B											UPDATE	IMS_B forwards UPDATE to IBCF_B
37B											UPDATE	IBCF_B forwards UPDATE to IBCF_A
38B											UPDATE	IBCF_A forwards UPDATE to IMS_A
39B			.								UPDATE	IMS_A forwards UPDATE to UE_A
40B												User A is informed that call is on hold
41B											200 OK	UE_A responds to UPDATE with 200 OK indicating media attribute "recvonly"
42B											200 OK	IMS_A forwards 200 OK response to IBCF_A

Step				D	irection	n				Message	Comment
	U s e r A	U E A	I M S A	E N U M DB	I B C F A	ı	I M S B	U E B	U s e r B		
43B						\rightarrow				200 OK	IBCF_A forwards 200 OK response to IBCF_B
44B						;	•			200 OK	IBCF_B forwards 200 OK response to IMS_B
45B								\rightarrow		200 OK	IMS_B forwards the 200 OK response to UE_B
46B									\rightarrow		User B is informed that call is on hold
47B							←			ACK	UE_B acknowledges the receipt of 200 OK for UPDATE
48B						←—	_			ACK	IMS_B forwards ACK to IBCF_B
49B					(_				ACK	IBCF_B forwards ACK to IBCF_A
50B			\leftarrow							ACK	IBCF_A forwards ACK to IMS_A
51B		←								ACK	IMS_A forwards ACK to UE_A
52B								←			User B resumes call
53B							←			UPDATE	UE_B sends UPDATE message indicating media attribute "sendrecv" (Call Resume)
54B						←	_			UPDATE	IMS_B forwards UPDATE to IBCF_B
55B					←					UPDATE	IBCF_B forwards UPDATE to IBCF_A
56B			\leftarrow							UPDATE	IBCF_A forwards UPDATE to IMS_A
57B		←								UPDATE	IMS_A forwards UPDATE to UE_A
58B	←										User A is informed that call is resumed
59B			\rightarrow							200 OK	UE_A responds to UPDATE with 200 OK indicating media attribute "sendrecv"
60B					\rightarrow					200 OK	IMS_A forwards 200 OK response to IBCF_A
61B						\rightarrow				200 OK	IBCF_A forwards 200 OK response to IBCF_B
62B							>			200 OK	IBCF_B forwards 200 OK response to IMS_B
63B								\rightarrow		200 OK	IMS_B forwards the 200 OK response to UE_B
64B											User B is informed that call is resumed



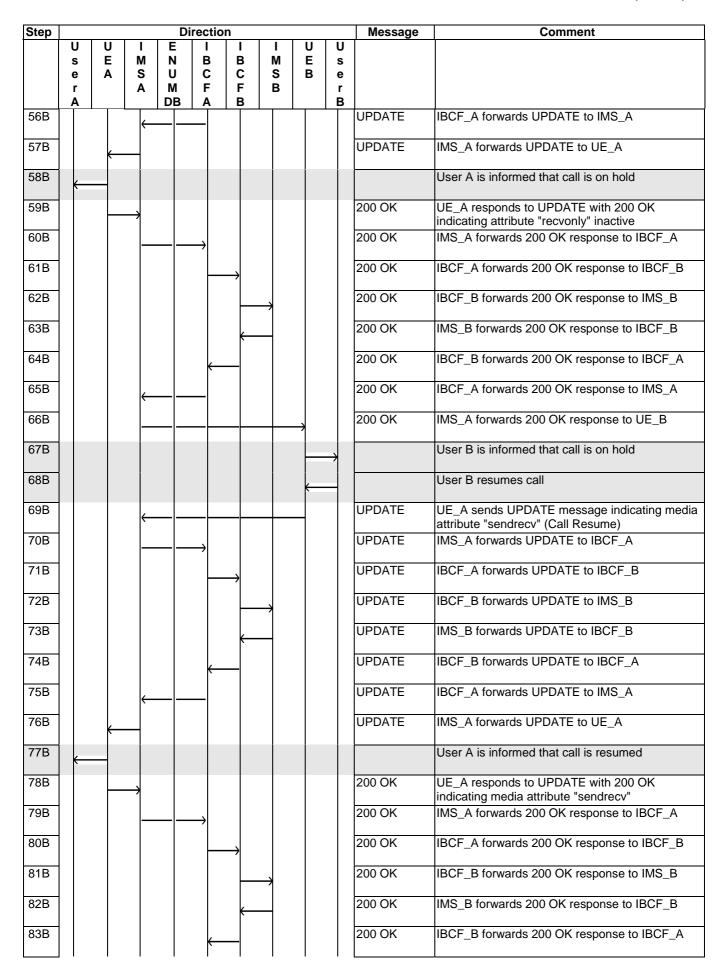
4.4.3.2.3 UC_04_R: SIP Call Flow "call hold and resume" using UPDATE with CF_ROAM_CALL

Step				D	irectio	n				Message	Comment
	U s e r A	U E A	M S A	E N U M DB	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 calls User B
2			\rightarrow							INVITE	UE_A sends INVITE with the first SDP offer indicating all desired medias and codecs that
3		←								100 Trying	IMS_A responds with a 100 Trying provisional response
4				\rightarrow						ENUM	IMS_A sends query to ENUM DB
5			\leftarrow							ENUM	ENUM DB sends response to IMS_A
6					\rightarrow					INVITE	IMS_A forwards INVITE to IBCF_A
7			←							100 Trying	IBCF_A responds with a 100 Trying provisional response
8						\rightarrow				INVITE	IBCF_A forwards INVITE to IBCF_B
9					←					100 Trying	IBCF_B responds with a 100 Trying provisional response

Step				Dire	ction)				Message	Comment
	U s	UE	I E		I B	I B	I M	щС	Us		
	e	Ā	s l	J	С	С	S	В	e		
	r A			M B	F A	F B	В		r B		
10						Ŀ	\rightarrow			INVITE	IBCF_B forwards INVITE to IMS_B
11						\leftarrow				100 Trying	IMS_B responds with a 100 Trying provisional response
12						\leftarrow				INVITE	IMS_B forwards INVITE to IBCF_B
13							\rightarrow			100 Trying	IBCF_B responds with a 100 Trying provisional response
14					\leftarrow					INVITE	IBCF_B forwards INVITE to IBCF_A
15						\rightarrow				100 Trying	IBCF_A responds with a 100 Trying provisional response
16					_					INVITE	IBCF_A forwards INVITE to IMS_A
17)					100 Trying	IMS_A responds with a 100 Trying provisional response
18								-		INVITE	IMS_A forwards INVITE to UE_B
19								1		100 Trying	UE_B optionally responds with a 100 Trying provisional response
20									→		User B is informed of incoming call of User A
21			\leftarrow							180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting
22)					180 Ringing	IMS_A forwards 180 Ringing response to IBCF_A
23						\rightarrow				180 Ringing	IBCF_A forwards 180 Ringing response to IBCF_B
24							\rightarrow			180 Ringing	IBCF_B forwards 180 Ringing response to IMS_B
25						\leftarrow				180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
26					\leftarrow					180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
27			\leftarrow		_					180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
28		+								180 Ringing	IMS_A forwards the 180 Ringing response to UE_A
29	(User A is informed that UE_B is ringing
30											User B answers call
31			 							200 OK	UE_B responds INVITE with 200 OK to indicate that the call has been answered
32					-					200 OK	IMS_A forwards 200 OK response to IBCF_A
33						\rightarrow				200 OK	IBCF_A forwards 200 OK response to IBCF_B
34							\rightarrow			200 OK	IBCF_B forwards 200 OK response to IMS_B
35						\leftarrow				200 OK	IMS_B forwards 200 OK response to IBCF_B
36					\leftarrow					200 OK	IBCF_B forwards 200 OK response to IBCF_A
37			\leftarrow							200 OK	IBCF_A forwards 200 OK response to IMS_A

Step					Dire	ction					Message	Comment
	U s	U E	I M	E N		I B	I B	I M	U E	U s		
	е	Ā	S	Ŭ		C F	C F	S B	В	е		
	r A		A	DE		Ā	В	В		r B		
38		←									200 OK	IMS_A forwards 200 OK response to UE_A
39	—											User A is informed that call has been answered
40			\rightarrow								ACK	UE_A acknowledges the receipt of 200 OK for INVITE
41					\longrightarrow						ACK	IMS_A forwards ACK to IBCF_A
42							\rightarrow				ACK	IBCF_A forwards ACK to IBCF_B
43								\rightarrow			ACK	IBCF_B forwards ACK to IMS_B
44							—				ACK	IMS_B forwards ACK to IBCF_B
45						\leftarrow					ACK	IBCF_B forwards ACK to IBCF_A
46			←								ACK	IBCF_A forwards ACK to IMS_A
47									\rightarrow		ACK	IMS_A forwards ACK to UE_B
48										\rightarrow		User B is presented that call is in progress
49A	-	\rightarrow										User A puts call on hold
50A		_	-;								UPDATE	UE_A sends UPDATE message indicating media attribute "sendonly" (Call Hold)
51A			_			,					UPDATE	IMS_A forwards UPDATE to IBCF_A
52A							\rightarrow				UPDATE	IBCF_A forwards UPDATE to IBCF_B
53A								\rightarrow			UPDATE	IBCF_B forwards UPDATE to IMS_B
54A							—				UPDATE	IMS_B forwards UPDATE to IBCF_B
55A						\leftarrow	_				UPDATE	IBCF_B forwards UPDATE to IBCF_A
56A			←								UPDATE	IBCF_A forwards UPDATE to IMS_A
57A									\rightarrow		UPDATE	IMS_A forwards UPDATE to UE_B
58A										\rightarrow		User B is informed that call is on hold
59A			←								200 OK	UE_B responds to UPDATE with 200 OK indicating attribute "recvonly" inactive
60A			_								200 OK	IMS_A forwards 200 OK response to IBCF_A
61A							\rightarrow				200 OK	IBCF_A forwards 200 OK response to IBCF_B
62A								\rightarrow			200 OK	IBCF_B forwards 200 OK response to IMS_B
63A							\leftarrow	_			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

Step					irecti	on					Message	Comment
	U s	U E	I M	ЕZ	I B	l B	I M		U E	U s		
	e	Ā	S	U	С	С	S	; E	В	e		
	r A		Α	M DB	F	F B	В	3		r B		
66A		<u> </u>				Ī			ı		200 OK	IMS_A forwards 200 OK response to UE_A
67A	—											User A is informed that call is on hold
68A		\rightarrow										User A resumes call
69A			\rightarrow								UPDATE	UE_A sends UPDATE message indicating media attribute "sendrecv" (Call Resume)
70A					\rightarrow						UPDATE	IMS_A forwards UPDATE to IBCF_A
71A					-	\longrightarrow					UPDATE	IBCF_A forwards UPDATE to IBCF_B
72A						-	\longrightarrow				UPDATE	IBCF_B forwards UPDATE to IMS_B
73A						←					UPDATE	IMS_B forwards UPDATE to IBCF_B
74A					←						UPDATE	IBCF_B forwards UPDATE to IBCF_A
75A			\leftarrow								UPDATE	IBCF_A forwards UPDATE to IMS_A
76A								\longrightarrow			UPDATE	IMS_A forwards UPDATE to UE_B
77A										\rightarrow		User B is informed that call is resumed
78A			\leftarrow		_						200 OK	UE_B responds to UPDATE with 200 OK indicating media attribute "sendrecv"
79A					\rightarrow						200 OK	IMS_A forwards 200 OK response to IBCF_A
80A					_	\longrightarrow					200 OK	IBCF_A forwards 200 OK response to IBCF_B
81A							\longrightarrow				200 OK	IBCF_B forwards 200 OK response to IMS_B
82A						←					200 OK	IMS_B forwards 200 OK response to IBCF_B
83A					(200 OK	IBCF_B forwards 200 OK response to IBCF_A
84A			\leftarrow								200 OK	IBCF_A forwards 200 OK response to IMS_A
85A		—	_								200 OK	IMS_A forwards the 200 OK response to UE_A
86A	\leftarrow											User B is informed that call has resumed
49B								(User B puts call on hold
50B			\leftarrow								UPDATE	UE_B sends UPDATE message indicating media attribute "sendonly" (Call Hold)
51B					\rightarrow						UPDATE	IMS_A forwards UPDATE to IBCF_A
52B					-	\longrightarrow					UPDATE	IBCF_A forwards UPDATE to IBCF_B
53B							\longrightarrow				UPDATE	IBCF_B forwards UPDATE to IMS_B
54B						-					UPDATE	IMS_B forwards UPDATE to IBCF_B
55B					←						UPDATE	IBCF_B forwards UPDATE to IBCF_A



Step				Di	rectio	n				Message	Comment
	U s	U E	I M	E N	I B	I B	I M	U E	U		
	e	Ā	S	U	С	С	S	В	e		
	r A		Α	M DB	F A	F B	В		r B		
84B			\leftarrow							200 OK	IBCF_A forwards 200 OK response to IMS_A
85B								\rightarrow		200 OK	IMS_A forwards the 200 OK response to UE_B
86B											User B is informed that call is resumed
87		\rightarrow									User A ends call
88			\rightarrow							BYE	UE_A releases the call with BYE
89					\rightarrow					BYE	IMS_A forwards BYE to IBCF_A
90						\rightarrow				BYE	IBCF_A forwards BYE to IBCF_B
91							—			BYE	IBCF_B forwards BYE to IMS_B
92						←				BYE	IMS_B forwards BYE to IBCF_B
93					\leftarrow					BYE	IBCF_B forwards BYE to IBCF_A
94			\leftarrow							BYE	IBCF_A forwards BYE to IMS_A
95								\rightarrow		BYE	IMS_A forwards BYE to UE_B
96									\rightarrow		User B is informed that call has ended
97			\leftarrow							200 OK	UE_B sends 200 OK for BYE
98					\rightarrow					200 OK	IMS_A forwards the 200 OK response to IBCF_A
99						\rightarrow				200 OK	IBCF_A forwards 200 OK response to IBCF_B
100							\rightarrow			200 OK	IBCF_B forwards 200 OK response to IMS_B
101						←				200 OK	IMS_B forwards 200 OK response to IBCF_B
102					\leftarrow					200 OK	IBCF_B forwards 200 OK response to IBCF_A
103			\leftarrow							200 OK	IBCF_A forwards 200 OK response to IMS_A
104		←								200 OK	IMS_A forwards the 200 OK response to UE_A
105	—										User A is informed that call has ended

4.4.4 IMS message exchange between UEs in different networks

4.4.4.1 Description

The UE_A sends a MESSAGE to UE_B located in a different network.

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

Step	Action	CF_INT_CALL	CF_ROAM_CALL
1	User A sends an instant message	Step 1	Step 1
2	User B is informed about the instant message	Step 9	Step 12
3	Optional: User A is presented a delivery report	Step 15	Step 21

4.4.4.2 UC_05_I: SIP Call flow for IMS Message Exchange with CF_INT_CALL

Step					Dire	ction					Message	Comment
2.56	U	U	I	Е			ı	ı	U	U		
	S	E	M			3	В	M	E	S		
	e r	Α	S				C F	S B	В	e r		
	À			DE			В			В		
1		\rightarrow										User A sends an instant message to user B
2			\longrightarrow								MESSAGE	UE_A sends MESSAGE to IMS_A
3			-	\longrightarrow							ENUM	IMS_A sends query to ENUM DB
4			•								ENUM	ENUM DB sends response to IMS_A
5			-			>					MESSAGE	IMS_A sends MESSAGE to IBCF_A
6							,				MESSAGE	IBCF_A sends MESSAGE to IBCF_B
7								\rightarrow			MESSAGE	IBCF_B sends MESSAGE to IMS_B
8									\rightarrow		MESSAGE	IMS_B sends MESSAGE to UE_B
9										\rightarrow		User B is informed about the instant message
10								—			200 OK	UE_B sends 200 OK to IMS_B
11							←	_			200 OK	IMS_B sends 200 OK to IBCF_B
12											200 OK	IBCF_B sends 200 OK to IBCF_A
13			•	←							200 OK	IBCF_A sends 200 OK to IMS_A
14		(200 OK	IMS_A sends 200 OK to UE_A
15	←											Optional: User A is presented a delivery report

4.4.4.3 UC_05_R: SIP Call Flow for IMS Message Exchange with CF_ROAM_CALL

Step		D	irection				Message	Comment
	U U I s E M	E N	I B	I I 3 M	υE	U		
	e A S	U M		SB	В	e r		
1	A	DB		3		В		User A sends an instant message to user B
2							MESSAGE	UE_A sends MESSAGE to IMS_A
3		\longrightarrow					ENUM	IMS_A sends query to ENUM DB
4		· · · · · · · · · · · · · · · · · · ·					ENUM	ENUM DB sends response to IMS_A
5	-		\longrightarrow				MESSAGE	IMS_A sends MESSAGE to IBCF_A
6			<u> </u>				MESSAGE	IBCF_A sends MESSAGE to IBCF_B
7				$\longrightarrow \Big $			MESSAGE	IBCF_B sends MESSAGE to IMS_B
8							MESSAGE	IMS_B sends MESSAGE to IBCF_B
9							MESSAGE	IBCF_B sends MESSAGE to IBCF_A
10	│	_					MESSAGE	IBCF_A sends MESSAGE to IMS_A
11					\longrightarrow		MESSAGE	IMS_A sends MESSAGE to UE_B
12						\longrightarrow		User B is informed about the instant message
13							200 OK	UE_B sends 200 OK to IMS_A
14			\rightarrow				200 OK	IMS_A sends 200 OK to IBCF_A
15			\longmapsto				200 OK	IBCF_A sends 200 OK to IBCF_B
16				$ \longrightarrow $			200 OK	IBCF_B sends 200 OK to IMS_B
17				\leftarrow			200 OK	IMS_B sends 200 OK to IBCF_B
18							200 OK	IBCF_B sends 200 OK to IBCF_A
19			_				200 OK	IBCF_A sends 200 OK to IMS_A
20							200 OK	IMS_A sends 200 OK to UE_A
21								Optional: User A is presented a delivery report

4.4.5 Supplementary Service Anonymous Communication Rejection (ACR)

4.4.5.1 Description

UE_A makes an IMS VoIP call to UE_B. UE_A is subscribed to OIR service in permanent mode or default presentation restricted temporary mode, UE_B is subscribed to ACR supplementary service. The call flow path and node configuration for this use case corresponds to CF_INT_AS when UE_B is in home network and to CF_ROAM_AS when UE_B is roaming in IMS_A.

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

Step	Action	CF_INT_AS
1	User A calls User B	Step 1
2	User A is informed that call has been rejected due to ACR	Step 25

Step	Action	CF_ROAM_AS
1	User B calls User A	Step 1
2	User B is informed that call has been rejected due to ACR	Step34

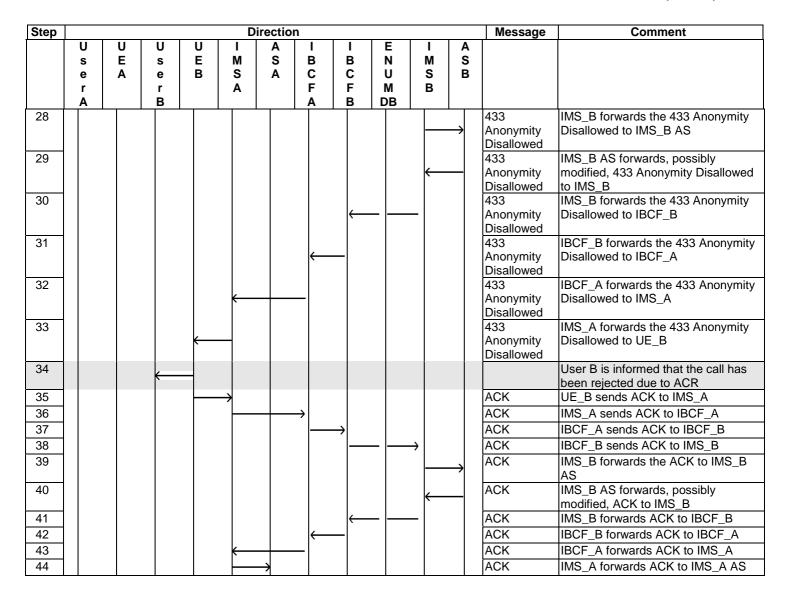
4.4.5.2 UC_06_I: SIP message flow for SS ACR with CF_INT_AS

Step					Di	rection	<u> </u>					Message	Comment
	U s e r A	U E A	U s e r B	U E B	M S A	E N U M DB	A S A	I B C F A	I B C F B	I M S B	A S B		
1		→											User A calls User B
2					\rightarrow							INVITE	UE_A sends INVITE with the first SDP offer indicating all desired
3		-										100 Trying	IMS_A responds with a 100 Trying provisional response
4						\rightarrow						ENUM	IMS_A sends query to ENUM DB
5						_						ENUM	ENUM DB sends response to IMS_A
													INVITE triggers the OIR IFC in IMS_A
6						_	\rightarrow					INVITE	IMS_A forwards the INVITE to IMS_A AS
7					←	_	_					100 Trying	IMS_A AS optionally responds with a 100 Trying provisional response
8					\leftarrow	_						INVITE	IMS_A AS returns modified INVITE including Privacy header (value "id"
9						_	\rightarrow					100 Trying	IMS_A responds with a 100 Trying provisional response
10						_		\rightarrow				INVITE	IMS_A forwards INVITE to IBCF_A
11					\leftarrow	_						100 Trying	IBCF_A responds with a 100 Trying provisional response
12									\rightarrow			INVITE	IBCF_A forwards INVITE to IBCF_B
13								\leftarrow	_			100 Trying	IBCF_B responds with a 100 Trying provisional response

14	Step				Di	rection						Message	Comment
e A e B S U M A C C C S B B INVITE IBCF B forwards INVITE to IMS B 100 Trying IMS B responds with a 100 Trying provisional response INVITE triggers the ACR IFC in IMS B AS 100 Trying AS optionally responds with a 33 Anonymity Anonymity Disallowed to IMS AS 100 Trying provisional response 433 Anonymity Anonymity Disallowed to IMS B Forwards the 433 Anonymity Disallowed to IMS B Forwards the 433 Anonymity Disallowed to IMS B Forwards the 433 Anonymity Disallowed to IMS ANONYMITY Disallowed to IMS B Forwards the 433 Anonymity Disallowed to IMS B Forwards B Forward					ı	E	Α		I	I			
r A B A M B F F B B INVITE IBCF B forwards INVITE to IMS B 100 Trying IMS B responds with a 100 Try provisional response INVITE triggers the ACR IFC in IMS B S forwards the INVITE triggers the ACR IFC in IMS B S forwards the INVITE triggers the ACR IFC in IMS B S forwards the INVITE triggers the ACR IFC in IMS B S forwards the INVITE triggers the ACR IFC in IMS B AS anonymity and IMS B forwards the INVITE triggers the ACR IMS B S forwards the 433 Anonymity Disallowed to IMS B S forwards B S forward													
14 15 16 17 18 19 20 21 22 23 23 24 25 26 27 28 29 30 30 30 30 30 30 30 30 30 30 30 30 30			А	В		_	А		_		В		
IMS_B 100 Trying IMS_B responds with a 100 Try provisional response INVITE triggers the ACR IFC in IMS_B AS 100 Trying MS_B forwards the INVITE triggers the ACR IFC in IMS_B AS 100 Trying As optionally responds with a 33 Anonymity Disallowed to IMS_B AS 100 Trying provisional response 433 MS_B AS responds with 433 Anonymity Disallowed to IMS_B AS 100 Trying provisional response 433 Anonymity Disallowed to IMS_B AS 100 Trying provisional response 433 Anonymity Disallowed to IMS_B AS 100 Trying provisional response 433 Anonymity Disallowed to IMS_B AS 100 Trying provisional response 434 100 Trying provisional response 433 100 Trying provisional response 434 100 Trying provisional response 434 100 Trying provisional response 435 100 Trying provisional response 436 100 Trying provisional response 437 100 Trying provisional response 438 100 Trying provisional response 100 Trying pro					'`				1				
provisional response INVITE triggers the ACR IFC in IMS_B INVITE IMS_B S AS IMS_B AS AS optionally responds with a an anonymity possible of the Acronymity o	14									\rightarrow		INVITE	
16 17 18 19 20 21 21 22 23 23 24 25 26 27 28 29 30 30 INVITE IMS_B AS	15								←			100 Trying	IMS_B responds with a 100 Trying provisional response
IMS_B AS 100 Trying AS optionally responds with as 17 Trying provisional response 433 IMS_B AS responds with 433 Anonymity Disallowed to IMS_B ANOnymity Disallowed to IMS_B ANOnymity Disallowed to IBC 433 IBCF_B forwards the 433 Anonymity Disallowed to IBC 433 IBCF_A forwards the 433 Anonymity Disallowed to IMS_B ANONYMITY DISALIOWED ANONYM													
18 19 20 21 21 22 23 24 25 26 27 28 29 30 30 Trying provisional response 433 Anonymity Disallowed to IMS_ 433 Anonymity Disallowed to IBC 433 Anonymity Disallowed to IBC 433 Anonymity Disallowed to IBC 433 Anonymity Disallowed to IMS_ 433 Anonymity Anonymity Disallowed to IMS_ 433 Anonymity Anonymity Disallowed to IMS_ 433 Anonymity modified, 433 Anonymity modified, 433 Anonymity 433 Anonymity modified, 433 Anonymity Disallowed to UE_A 25 26 27 28 28 29 30 30 ACK IMS_A AS forwards, possibly modified, ACK to IMS_A ACK IMS_A AS forwards the ACK to IMS_A ACK IMS_A AS forwards, possibly modified, ACK to IMS_A ACK IMS_A AS forwards ACK to IMS_A ACK IMS_A AS forwards ACK to IBCF_A ACK IMS_A	16										\rightarrow	INVITE	
Anonymity Anonymity Disallowed to IMS_433 IMS_B forwards the 433 Anonymity Disallowed to IBC_813 Anonymity Disallowed to IBC_433 IBCF_B forwards the 433 Anonymity Disallowed to IMS_433 IBCF_A forwards the 433 Anonymity Disallowed to IMS_433 IMS_A forwards the 433 Anonymity Disallowed to IMS_433 IMS_A forwards the 433 Anonymity Disallowed to IMS_433 IMS_A forwards the 433 Anonymity modified, 433 Anonymity Disallowed to IMS_433 IMS_A forwards the 43	17									←		100 Trying	AS optionally responds with a 100 Trying provisional response
Anonymity Anonymity Disallowed to IBC 433	18									←		Anonymity	Anonymity Disallowed to IMS_B
Anonymity Anonymity Disallowed to IBC 433	19								←				IMS_B forwards the 433 Anonymity Disallowed to IBCF_B
Anonymity Anonymity Disallowed to IMS 433 IMS_A forwards the 433 Anonymity Disallowed to IMS 433 IMS_A AS forwards, possibly modified, ACK to IMS_A ACK IMS_A AS forwards he ACK to IMS_A ACK IMS_A AS forwards, possibly modified, ACK to IMS_A ACK IMS_A forwards ACK to IBCF_A ACK IMS_A forwards ACK to IMS_A	20							\leftarrow					IBCF_B forwards the 433 Anonymity Disallowed to IBCF_A
Anonymity Anonymity Disallowed to IMS Anonymity Anonymity Disallowed to IMS Anonymity Modified, 433 Anonymity Alims_A forwards the 433 Anonymity Disallowed to UE_A User A is informed that the call been rejected due to ACR ACK UE_A sends ACK to IMS_A ACK IMS_A forwards the ACK to IM AS ACK IMS_A AS forwards, possibly modified, ACK to IMS_A ACK IMS_A forwards ACK to IBCF_ ACK IMS_A forwards ACK to IBCF_ ACK IBCF_A forwards ACK to IBCF_	21				\leftarrow								IBCF_A forwards the 433 Anonymity Disallowed to IMS_A
Anonymity modified, 433 Anonymity 433 IMS_A forwards the 433 Anony Disallowed to UE_A User A is informed that the call been rejected due to ACR ACK UE_A sends ACK to IMS_A ACK IMS_A forwards the ACK to IM AS ACK IMS_A AS forwards, possibly modified, ACK to IMS_A ACK IMS_A forwards ACK to IBCF_ ACK IMS_A forwards ACK to IBCF_	22					_	\rightarrow						IMS_A forwards the 433 Anonymity Disallowed to IMS_A
Anonymity Disallowed to UE_A User A is informed that the call been rejected due to ACR ACK UE_A sends ACK to IMS_A ACK IMS_A forwards the ACK to IM AS ACK IMS_A AS forwards, possibly modified, ACK to IMS_A ACK IMS_A forwards ACK to IBCF_ ACK IBCF_A forwards ACK to IBCF_	23				\leftarrow	_							
been rejected due to ACR ACK UE_A sends ACK to IMS_A ACK IMS_A forwards the ACK to IM AS ACK IMS_A AS forwards, possibly modified, ACK to IMS_A ACK IMS_A forwards ACK to IBCF_ ACK IMS_A forwards ACK to IBCF_ ACK IBCF_A forwards ACK to IBCF_	24		\leftarrow		_								IMS_A forwards the 433 Anonymity Disallowed to UE_A
26 27 28 29 30 ACK UE_A sends ACK to IMS_A ACK IMS_A forwards the ACK to IM AS ACK IMS_A AS forwards, possibly modified, ACK to IMS_A ACK IMS_A forwards ACK to IBCF_ ACK IBCF_A forwards ACK to IBCF_	25	←											User A is informed that the call has been rejected due to ACR
28 29 30 AS ACK IMS_A AS forwards, possibly modified, ACK to IMS_A ACK IMS_A forwards ACK to IBCF_ ACK IBCF_A forwards ACK to IBCF	26			+	\rightarrow							ACK	
29 30 modified, ACK to IMS_A ACK IMS_A forwards ACK to IBCF_ ACK IBCF_A forwards ACK to IBCF	27						\rightarrow					ACK	IMS_A forwards the ACK to IMS_A AS
29 30 ACK IMS_A forwards ACK to IBCF_ ACK IBCF_A forwards ACK to IBCF_	28				\leftarrow	_						ACK	
	29					_		\rightarrow				ACK	IMS_A forwards ACK to IBCF_A
31 ACK IBCF B forwards ACK to IMS	30								\rightarrow			ACK	IBCF_A forwards ACK to IBCF_B
	31									\rightarrow		ACK	IBCF_B forwards ACK to IMS_B
32 ACK IMS_B forwards ACK to IMS_E	32										\rightarrow	ACK	IMS_B forwards ACK to IMS_B AS

4.4.5.3 UC_06_R: SIP message flow for SS ACR with CF_ROAM_AS

Step					Di	rection						Message	Comment
	U	U	U	U	I	Α	I	I	Е	I	Α		
	S	E	S	E	M	S	В	В	N	M	S		
	e r	Α	e r	В	S	Α	C F	C F	U M	S	В		
	Å		В		^		Ä	В	DB				
1				\rightarrow									User B calls User A
2					\rightarrow							INVITE	UE_B sends INVITE with the first SDP offer indicating all desired media and codecs that UE_B
													supports
3												100 Trying	IMS_A responds with a 100 Trying provisional response
4						+	•					INVITE	IMS_A sends INVITE to IBCF_A
5					←		-					100 Trying	IBCF_A responds with a 100 Trying provisional response
6								→				INVITE	IBCF_A sends INVITE to IBCF_B
7							-					100 Trying	IBCF_B responds with a 100 Trying provisional response
8									-	\rightarrow		INVITE	IBCF_B sends INVITE to IMS_B
9								←	_	_		100 Trying	IMS_B responds with a 100 Trying provisional response
10									\leftarrow	-		ENUM	IMS B sends query to ENUM DB
11										\rightarrow		ENUM	ENUM DB sends response to IMS B
													INVITE triggers the OIR IFC in IMS_B
12										_	\longrightarrow	INVITE	IMS_B forwards the INVITE to IMS_B AS
13										\leftarrow		100 Trying	IMS_B AS optionally responds with a 100 Trying provisional response
14										←		INVITE	IMS_B AS returns modified INVITE including Privacy header (value "id" or "header") to IMS_B
15											\longrightarrow	100 Trying	IMS_B responds with a 100 Trying provisional response
16								\leftarrow	_	-		INVITE	IMS_B forwards INVITE to IBCF_B
17								-	_	\rightarrow		100 Trying	IBCF_B responds with a 100 Trying provisional response
18							\leftarrow	-				INVITE	IBCF_B forwards INVITE to IBCF_A
19							-	→				100 Trying	IBCF_A responds with a 100 Trying provisional response
20					←							INVITE	IBCF_A forwards INVITE to IMS_A
21						 ;	•					100 Trying	IMS_A responds with a 100 Trying provisional response
													INVITE triggers the ACR IFC in IMS_A
22						-						INVITE	IMS_A forwards the INVITE to IMS_A AS
23					\leftarrow							100 Trying	AS optionally responds with a 100 Trying provisional response
24												433 Anonymity Disallowed	IMS_A AS responds with 433 Anonymity Disallowed to IMS_A
25							>					433 Anonymity Disallowed	IMS_A forwards the 433 Anonymity Disallowed to IBCF_A
26								•				433 Anonymity Disallowed	IBCF_A forwards the 433 Anonymity Disallowed to IBCF_B
27									_	\rightarrow		433 Anonymity Disallowed	IBCF_B forwards the 433 Anonymity Disallowed to IMS_B
	•	•	•	•	•	•	•	•		•	i		•



4.4.6 Supplementary Service Outgoing Communication Barring (OCB)

4.4.6.1 Description

UE_B places an IMS VoIP call to UE_A. UE_B is subscribed to OCB service and based on the UE_B identity the OCB service is invoked. The call flow path and node configuration for this use case corresponds to CF_INT_AS when UE_B is in home network and to CF_ROAM_AS when UE_B is roaming in IMS_A.

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 calls User A	Step 1	Step 1
2	User B is informed that call was declined	Step 11	Step 19

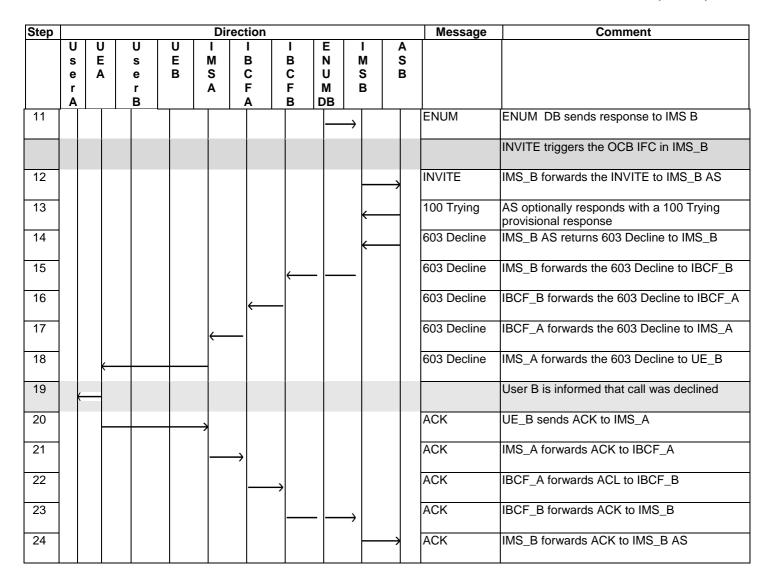
4.4.6.2 UC_07_I: SIP message flow for SS OCB with CF_INT_AS

The expected call flow sequence is:

Step					Dir	ection	1				Message	Comment
	U s	. П.С	s C	UE	I M	В	В	E N	I M	A S		
	e r A	Α	e r B	В	S A	C F A	C F B	U M DB	S B	В		
1				\rightarrow								User B calls User A
2							_	_	→		INVITE	UE_B sends INVITE with the first SDP offer indicating all desired media and codecs that UE_B supports
3				\leftarrow		_	_	_	-		100 Trying	IMS_B responds with a 100 Trying provisional response
4								\leftarrow	-		ENUM	IMS B sends query to ENUM DB
5									→		ENUM	ENUM DB sends response to IMS B
												INVITE triggers the OCB IFC in IMS_B
6										→	INVITE	IMS_B forwards the INVITE to IMS_B AS
7											100 Trying	AS optionally responds with a 100 Trying provisional response
8											603 Decline	IMS_B AS returns 603 Decline to IMS_B
9				\leftarrow		_	_	_	-		603 Decline	IMS_B forwards the 603 Decline to UE_B
11			←									User B is informed that call was declined
12								_	→		ACK	UE_B sends ACK to IMS_B
13)	ACK	IMS_B forwards ACK to IMS_B AS

4.4.6.3 UC_07_R: SIP message flow for SS OCB with CF_ROAM_AS

Step						Dii	ection					Messag	e Comment
	U s e r A	U E A	1	J s e r 3	U E B	I M S A	I B C F A	I B C F B	E N U M DB	M S B	A S B		
1					>								User B calls User A
2						\rightarrow						INVITE	UE_B sends INVITE with the first SDP offer indicating all desired media and codecs that
3					—							100 Trying	IMS_A responds with a 100 Trying provisional response
4							\rightarrow					INVITE	IMS_A forwards INVITE to IBCF_A
5						\leftarrow	_					100 Trying	IBCF_A responds with a 100 Trying provisional response
6								\rightarrow				INVITE	IBCF_A forwards INVITE to IBCF_B
7							←	_				100 Trying	IBCF_B responds with a 100 Trying provisional response
8										\rightarrow		INVITE	IBCF_B forwards INVITE to IMS_B
9								\leftarrow	_	_		100 Trying	IMS_B responds with a 100 Trying provisional response
10									\leftarrow			ENUM	IMS B sends query to ENUM DB



4.4.7 Supplementary Service Originating Identification Presentation (OIP)

4.4.7.1 Description

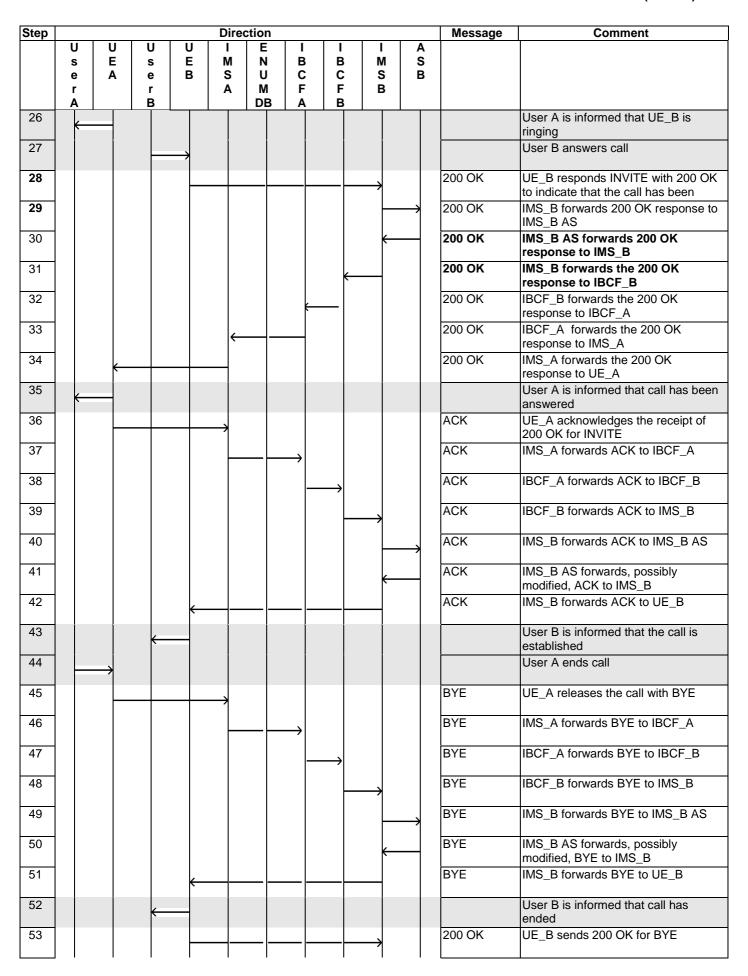
UE_A places an IMS VoIP call to UE_B. UE_B is subscribed to OIP service. The call flow path and node configuration for this use case corresponds to CF_INT_AS when UE_B is in home network and to CF_ROAM_AS when UE_B is roaming in IMS_A.

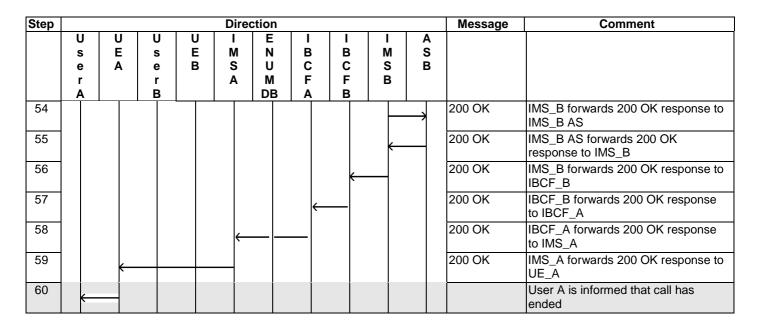
The test sequence typically associated with this use case when is as follows (CFW step numbers refer the call flow step numbering):

Step	Action	CF_INT_AS	CF_ROAM_AS
1	User A calls User B	Step 1	Step 1
2	User B is informed of incoming call of User A, user A's identity is	Step 18	Step 24
	displayed		
3	User A is informed that UE_B is ringing	Step 26	Step 35
4	User B answers call	Step 27	Step 36
5	User A is informed that call has been answered	Step 35	Step 47
6	User B is informed that the call is established	Step 43	Step 58
7	User A ends call	Step 44	Step 59
8	User B is informed that call has ended	Step 52	Step 70
9	User A is informed that call has ended	Step 60	Step 81

4.4.7.2 UC_08_I: SIP message flow for SS OIP with CF_INT_AS

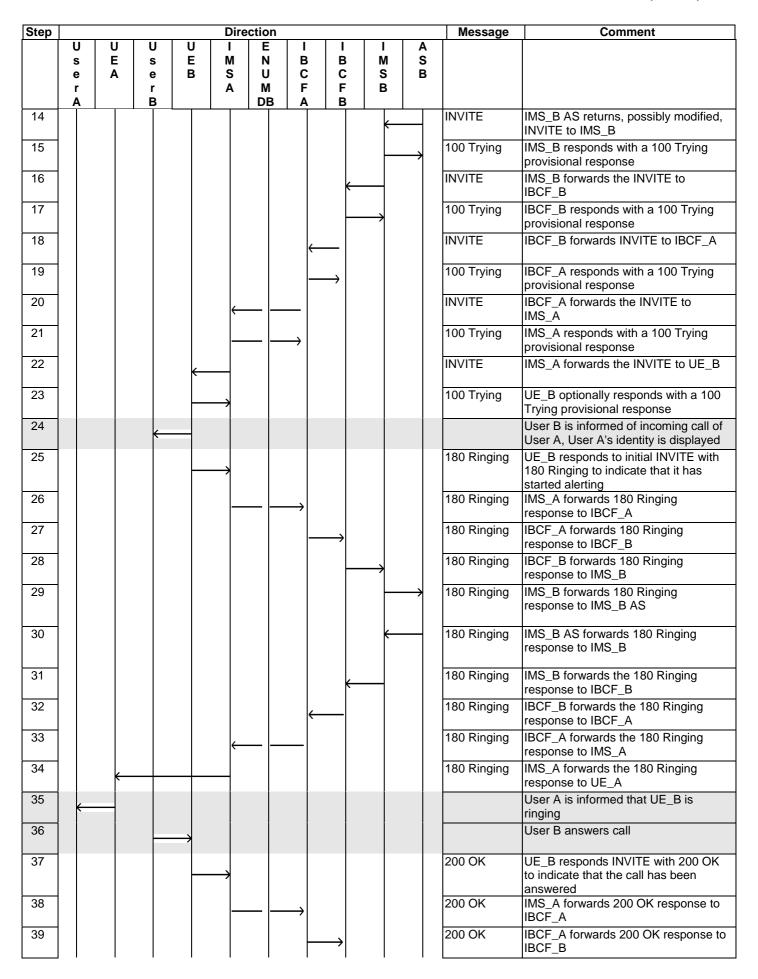
SDP offer indicated to the second sec	
e A e r B A M M F F F B B B User A calls User 1 User A calls User INVITE UE_A sends INVISDP offer indicate 100 Trying IMS_A responds of provisional respondence in the control of the co	
T A B A M DB A B B User A calls User User A calls User User A calls User INVITE UE_A sends INVI SDP offer indicat 100 Trying IMS_A responds v provisional responded in the sended in	
1 User A calls User INVITE UE_A sends INVI SDP offer indicat 100 Trying IMS_A responds w provisional respon ENUM ENUM DB sends ENUM ENUM DB sends INVITE IBCF_A respond Trying provisional INVITE IBCF_B respond Trying provisional INVITE IBCF_B forwards	
INVITE UE_A sends INVISDP offer indicated 100 Trying IMS_A responds we provisional respondence in the provisional respondenc	
SDP offer indicated to the second sec	r B
provisional respondence of the	/ITE with the first ating all desired
5 6 7 8 9 100 Trying IBCF_A responds INVITE IBCF_B responds IBCF_B 100 Trying IBCF_B responds INVITE IBCF_B forwards	
INVITE IMS_A forwards	ery to ENUM DB
7 8 9 100 Trying IBCF_A responds Trying provisions IBCF_B 100 Trying IBCF_B responds Trying provisions INVITE IBCF_B forwards INVITE triggers th IMS_B	s response to IMS
Trying provisional INVITE IBCF_A forwards IBCF_B 100 Trying IBCF_B responds to provisional responds to provisional responds to the provisiona	INVITE to IBCF_A
8 9 100 Trying IBCF_B responds Trying provisional INVITE IBCF_B forwards IBCF_B forwards IBCF_B forwards IBCF_B forwards IBCF_B forwards INVITE IBCF_B forwards IBCF_B forward	
100 Trying IBCF_B responds Trying provisional INVITE IBCF_B forwards 11	
11 100 Trying IMS_B responds we provisional respond INVITE triggers the IMS_B	
provisional responsional INVITE triggers the IMS_B	s INVITE to IMS_B
INVITE triggers th	
12 INVITE IMS_B forwards to IMS_B AS	the INVITE to
13 100 Trying AS optionally resp Trying provisional	
INVITE to IMS_B	
15 100 Trying IMS_B responds v provisional respon	
16 INVITE IMS_B forwards the	the INVITE to UE_B
17 100 Trying UE_B optionally re Trying provisional	responds with a 100 I response
	ed of incoming call of identity is displayed
180 Ringing to ind	o initial INVITE with dicate that it has
20 180 Ringing IMS_B forwards 1 response to IMS_I	_B AS
21 (180 Ringing IMS_B AS forward response to IMS_I	ds 180 Ringing
22 180 Ringing IMS_B forwards the response to IBCF_	the 180 Ringing
23 180 Ringing IBCF_B forwards response to IBCF_	
24 180 Ringing IBCF_A forwards response to IMS_/	
25 180 Ringing IMS_A forwards the response to UE_A	the 180 Ringing



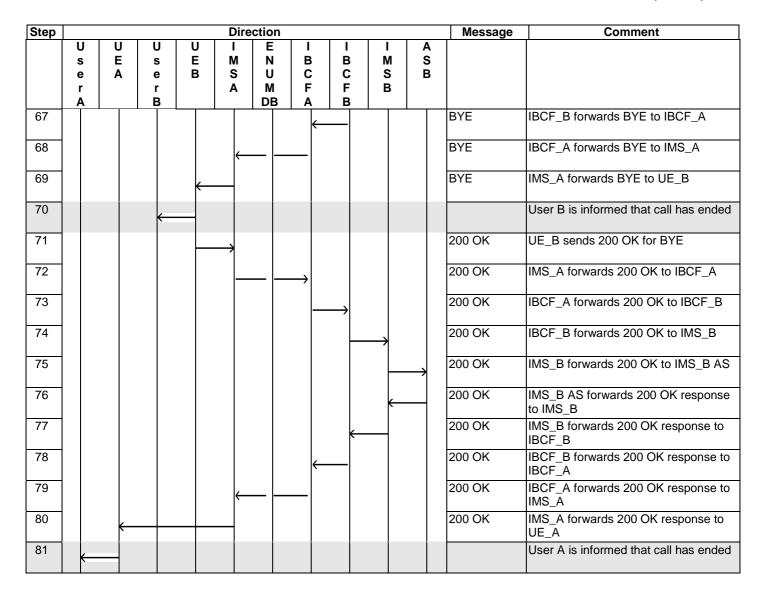


4.4.7.3 UC_08_R: SIP message flow for SS OIP with CF_ROAM_AS

Step						Dire	ectio	<u> </u>					Message	Comment
Step	U	U	U	,	U	I	E	<u>.</u>		<u> </u>		Α	wiessage	Comment
	s	E	s		Ē	M	N	Ė	3	B	M	S		
	е	Α	е	•	В	S	U	C		С	S	В		
	r		r			Α	M	F		F	В			
	Α	L.,	E	3			DE	S A	\	В				
1		\longrightarrow												User A calls User B
2													INVITE	UE_A sends INVITE with the first
														SDP offer indicating all desired
						1								media and codecs that UE_A
														supports
3		€											100 Trying	IMS_A responds with a 100 Trying provisional response
4							\longrightarrow						ENUM	IMS_A sends query to ENUM DB
5						\leftarrow							ENUM	ENUM DB sends response to IMS_A
6													INVITE	IMS_A forwards INVITE to IBCF_A
7						←							100 Trying	IBCF_A responds with a 100 Trying
						`								provisional response
8										\rightarrow			INVITE	IBCF_A forwards INVITE to IBCF_B
9									\leftarrow				100 Trying	IBCF_B responds with a 100 Trying provisional response
10											\rightarrow		INVITE	IBCF_B forwards INVITE to IMS_B
11										_			100 Trying	IMS_B responds with a 100 Trying
														provisional response
														INVITE triggers the OIP IFC in IMS_B
12												\rightarrow	INVITE	IMS_B forwards the INVITE to IMS_B AS
13													100 Trying	AS optionally responds with a 100 Trying provisional response



Step					Direc	tion						Message	Comment
	U s			U E	I M	E N	I B	I		I M	A S		
	e r	_		В	S	Ŭ M	C	F	;	S	В		
	A		В			DB	Ā	E					
40										\rightarrow		200 OK	IBCF_B forwards 200 OK response to IMS_B
41											\rightarrow	200 OK	IMS_B forwards 200 OK response to IMS_B AS
42										\leftarrow		200 OK	IMS_B AS forwards 200 OK response to IMS_B
43												200 OK	IMS_B forwards the 200 OK response to IBCF_B
44							(200 OK	IBCF_B forwards the 180 Ringing response to IBCF_A
45					←	_	_					200 OK	IBCF_A forwards the 180 Ringing response to IMS_A
46												200 OK	IMS_A forwards the 200 OK response to UE_A
47	-												User A is informed that call has been answered
48					>							ACK	UE_A acknowledges the receipt of 200 OK for INVITE
49						_	\rightarrow					ACK	IMS_A forwards ACK to IBCF_A
50								\longrightarrow	,			ACK	IBCF_A forwards ACK to IBCF_B
51										\rightarrow		ACK	IBCF_B forwards ACK to IMS_B
52											\rightarrow	ACK	IMS_B forwards ACK to IMS_B AS
53										—		ACK	IMS_B AS forwards, possibly modified, ACK to IMS_B
54												ACK	IMS_B forwards ACK to IBCF_B
55							←					ACK	IBCF_B forwards ACK to IBCF_A
56					←	_						ACK	IBCF_A forwards ACK to IMS_A
57												ACK	IMS_A forwards ACK to UE_B
58													User B is informed that the call is established
59)											User A ends call
60					>							BYE	UE_A releases the call with BYE
61						_	\rightarrow					BYE	IMS_A forwards BYE to IBCF_A
62								\longrightarrow				BYE	IBCF_A forwards BYE to IBCF_B
63										\rightarrow		BYE	IBCF_B forwards BYE to IMS_B
64											\rightarrow	BYE	IMS_B forwards BYE to IMS_B AS
65										←		BYE	IMS_B AS forwards, possibly modified, BYE to IMS_B
66										\dashv		BYE	IMS_B forwards BYE to IBCF_B



4.4.8 Supplementary Service Originating Identification Restriction (OIR)

4.4.8.1 Description

UE_B places an IMS VoIP call to UE_A. UE_A is subscribed to OIP service, UE_B is subscribed to OIR service in permanent mode or default presentation restricted temporary mode. The call flow path and node configuration for this use case corresponds to CF_INT_AS when UE_B is in home network and to CF_ROAM_AS when UE_B is roaming in IMS_A.

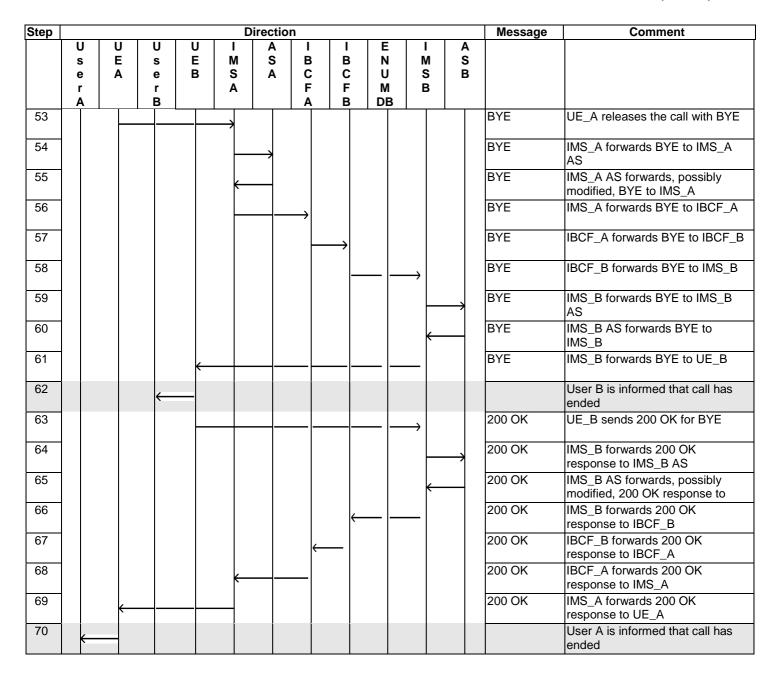
The test sequence typically associated with this use case is as follows (CFW step numbers refer the call flow step numbering):

Step	Action	CF_INT_AS	CF_ROAM_AS
1	User B calls User A	Step 1	Step 1
	User A is informed of incoming call of User B, user B's identity	Step 22	Step 28
	is not displayed		
3	User B is informed that UE_A is ringing	Step 32	Step 41
4	User A answers call	Step 33	Step 42
5	User B is informed that call has been answered	Step 43	Step 55
6	User A is informed that the call is established	Step 51	Step 66
7	User A ends call	Step 52	Step 67
8	User B is informed that call has ended	Step 62	Step 80
9	User A is informed that call has ended	Step 70	Step 91

4.4.8.2 UC_09_I: SIP message flow for SS OIR with CF_INT_AS

Step					Directio	n					Message	Comment
	U s		U L s E		A I S	I B	I B	E N	I M	A S		
	е	Α	e E		Α	C F	C F	U M	S	В		
	r A		r B	^		Ā	В	DB	_ <u>_</u>			
1			\longrightarrow									User B calls User A
2									\rightarrow		INVITE	UE_B sends INVITE with the first SDP offer indicating all desired
3				(100 Trying	IMS_B responds with a 100 Trying provisional response
4								←	_		ENUM	IMS B sends query to ENUM DB
5								_	\rightarrow		ENUM	ENUM DB sends response to IMS B
												INVITE triggers the OIR IFC in IMS_B
6											INVITE	IMS_B forwards the INVITE to IMS_B AS
7									(100 Trying	IMS_B AS optionally responds with a 100 Trying provisional
8									+		INVITE	IMS_B AS returns modified INVITE including Privacy header
9											100 Trying	IMS_B responds with a 100 Trying provisional response
10							\leftarrow	_ -			INVITE	IMS_B forwards the INVITE to IBCF_B
11							_	_ -	\longrightarrow		100 Trying	IBCF_B responds with a 100 Trying provisional response
12							_				INVITE	IBCF_B forwards the INVITE to IBCF_A
13							\longrightarrow				100 Trying	IBCF_A responds with a 100 Trying provisional response
14				•		_					INVITE	IBCF_A forwards the INVITE to IMS_A
15				-		\longrightarrow					100 Trying	IMS_A responds with a 100 Trying provisional response
												INVITE triggers the OIP IFC in IMS_A
16				-	\longrightarrow						INVITE	IMS_A forwards the INVITE to IMS_A AS
17				•	<u> </u>						100 Trying	IMS_A AS optionally responds with a 100 Trying provisional
18				•							INVITE	IMS_A AS returns modified INVITE including modified From
19					\longrightarrow						100 Trying	IMS_A responds with a 100 Trying provisional response
20											INVITE	IMS_A forwards the INVITE to UE_A
21				\longrightarrow							100 Trying	UE_A optionally responds with a 100 Trying provisional response
22												User A is informed of incoming call of User B, user B's identity is
23											180 Ringing	UE_A responds to initial INVITE with 180 Ringing to indicate that it
24					\longrightarrow						180 Ringing	IMS_A forwards the 180 Ringing to IMS_A AS

Step				D	irection						Message	Comment
	U U		U E	I M	A S	I B	I B	E N	I M	A S		
	e A	A e	В	S A	Α	C F	C F	U M	S B	В		
25	Α	В				Α	В	DB		1	180 Ringing	IMS_A AS forwards, possibly
				\leftarrow								modified, 180 Ringing to IMS_A
26						\rightarrow					180 Ringing	IMS_A forwards 180 Ringing response to IBCF_A
27							\rightarrow				180 Ringing	IBCF_A forwards 180 Ringing response to IBCF_B
28								_	\rightarrow		180 Ringing	IBCF_B forwards 180 Ringing response to IMS_B
29										\longrightarrow	180 Ringing	IMS_B forwards 180 Ringing response to IMS_B AS
30									←		180 Ringing	IMS_B AS forwards, possibly modified, 180 Ringing response
31			←					_			180 Ringing	IMS_B forwards the 180 Ringing response to UE_B
32		←										User B is informed that UE_A is ringing
33	\longrightarrow											User A answers call
34				\rightarrow							200 OK	UE_A responds INVITE with 200 OK to indicate that the call has
35					→						200 OK	IMS_A forwards the 200 OK to IMS_A AS
36				\leftarrow							200 OK	IMS_A AS forwards, possibly modified, 200 OK to IMS_A
37						\rightarrow					200 OK	IMS_A forwards 200 OK response to IBCF_A
38							\rightarrow				200 OK	IBCF_A forwards 200 OK response to IBCF_B
39								_	\rightarrow		200 OK	IBCF_B forwards 200 OK response to IMS_B
40										\longrightarrow	200 OK	IMS_B forwards 200 OK response to IMS_B AS
41									←		200 OK	IMS_B AS forwards, possibly modified, 200 OK response to
42			←					_	_		200 OK	IMS_B forwards the 200 OK response to UE_B
43		←										User B is informed that call has been answered
44									\rightarrow		ACK	UE_B acknowledges the receipt of 200 OK for INVITE
45										\longrightarrow	ACK	IMS_B forwards ACK to IMS_B AS
46									←		ACK	IMS_B AS forwards, possibly modified, ACK to IMS_B
47							\leftarrow	_			ACK	IMS_B forwards ACK to IBCF_B
48											ACK	IBCF_B forwards ACK to IBCF_A
49				\leftarrow		_					ACK	IBCF_A forwards ACK to IMS_A
50		- -									ACK	IMS_A forwards ACK to UE_A
51	(User A is informed that the call is established
52	\longrightarrow											User A ends call



4.4.8.3 UC_09_R: SIP message flow for SS OIR with CF_ROAM_AS

Step					D	irectio	n					Message	Comment
	U s e r	U E A	U s e r B	U E B	I M S A	A S A	I B C F	I B C F B	E N U M DB	M S B	A S B		
1 2	A			<u> </u>			A		I DB			INVITE	User B calls User A UE_B sends INVITE with the
2					\rightarrow								first SDP offer indicating all desired media and codecs that UE_B supports
3				←								100 Trying	IMS_A responds with a 100 Trying provisional response
4							\rightarrow					INVITE	IMS_A forwards INVITE to IBCF_A

Step						Direct	ion						Message	Comment
	U	J	U	Ū	I	A			J -	E	I	A		
	s e	1	s e	E B	M S	S			B C	N U	M S	S B		
	r	-	r	_	A		F		F	M	В			
	Α		В	1			A		В	DB	<u> </u>			
5					←								100 Trying	IBCF_A responds with a 100 Trying provisional response
6													INVITE	IBCF_A forwards INVITE to
							•		\rightarrow					IBCF_B
7													100 Trying	IBCF_B responds with a 100
8													INVITE	Trying provisional response IBCF_B forwards INVITE to
0										_ -	\rightarrow		IIIVIIE	IMS_B
9									_				100 Trying	IMS_B responds with a 100
														Trying provisional response
10										←			ENUM	IMS B sends query to ENUM DB
11											\rightarrow		ENUM	ENUM DB sends response to IMS B
														INVITE triggers the OIR IFC in
10													INVITE	IMS_B
12												\longrightarrow	INVITE	IMS_B forwards the INVITE to IMS_B AS
13													100 Trying	IMS_B AS optionally responds
											←			with a 100 Trying provisional
													IND/ITE	response
14											_		INVITE	IMS_B AS returns modified INVITE including Privacy header
											ľ			(value "id" or "header") to IMS_B
15													100 Trying	IMS_B responds with a 100
10												1	N 075	Trying provisional response
16									\leftarrow	_			INVITE	IMS_B forwards the INVITE to IBCF_B
17													100 Trying	IBCF_B responds with a 100
											7			Trying provisional response
18									_				INVITE	IBCF_B forwards the INVITE to IBCF_A
19													100 Trying	IBCF_A responds with a 100
									1					Trying provisional response
20					←		_						INVITE	IMS_B forwards the INVITE to IMS_A
21													100 Trying	IMS_A responds with a 100
														Trying provisional response
														INVITE triggers the OIP IFC in IMS_A
22													INVITE	IMS_A forwards the INVITE to
						\longrightarrow								IMS_A AS
23													100 Trying	IMS_A AS optionally responds
					—									with a 100 Trying provisional response
24													INVITE	IMS_A AS returns modified
					_									INVITE including modified From
					(and P-Asserted headers to
25													100 Trying	IMS_A responds with a 100
						\longrightarrow								Trying provisional response
26													INVITE	IMS_A forwards the INVITE to UE_A
27						\longrightarrow							100 Trying	UE_A optionally responds with a
28														100 Trying provisional response User A is informed of incoming
25	←													call of User B, user B's identity
														is not displayed
29													180 Ringing	UE_A responds to initial INVITE with 180 Ringing to indicate that
														it has started alerting
	1		1	1	ı	ı	ļ	•		ı	ı	1	L	

Step			 			ction						Message	Comment
	U s	U		U E 1		-	I B	I B	E N	I M	A		
	e	Ā		в	S A	A (C	С	U	S	В		
	r A		r B	'	4		F A	F B	M DB	В			
30	Î					\		Ť				180 Ringing	IMS_A forwards the 180 Ringing to IMS_A AS
31					(180 Ringing	IMS_A AS forwards, possibly modified, 180 Ringing to IMS_A
32						 	•					180 Ringing	IMS_A forwards 180 Ringing response to IBCF_A
33								\rightarrow				180 Ringing	IBCF_A forwards 180 Ringing response to IBCF_B
34									_	\longrightarrow		180 Ringing	IBCF_B forwards 180 Ringing response to IMS_B
35											\longrightarrow	180 Ringing	IMS_B forwards 180 Ringing response to IMS_B AS
36										+		180 Ringing	IMS_B AS forwards, possibly modified, 180 Ringing response to IMS_B
37								←	_			180 Ringing	IMS_B forwards the 180 Ringing response to IBCF_B
38							\leftarrow					180 Ringing	IBCF_B forwards the 180 Ringing response to IBCF_A
39							-					180 Ringing	IBCF_A forwards the 180 Ringing response to IMS_A
40												180 Ringing	IMS_A forwards the 180 Ringing response to UE_B
41													User B is informed that UE_A is ringing
42		\longrightarrow											User A answers call
43		-		<u> </u>								200 OK	UE_A responds INVITE with 200 OK to indicate that the call
44						•						200 OK	has been answered IMS_A forwards the 200 OK to IMS_A AS
45					.							200 OK	IMS_A AS forwards, possibly modified, 200 OK to IMS_A
46						 	•					200 OK	IMS_A forwards 200 OK response to IBCF_A
47								\rightarrow				200 OK	IBCF_A forwards 200 OK response to IBCF_B
48									_	\longrightarrow		200 OK	IBCF_B forwards 200 OK response to IMS_B
49										-	\longrightarrow	200 OK	IMS_B forwards 200 OK response to IMS_B AS
50										←		200 OK	IMS_B AS forwards, possibly modified, 200 OK response to
51								←	_			200 OK	IMS_B IMS_B forwards the 200 OK
52							\leftarrow	_				200 OK	response to IBCF_B IBCF_B forwards the 200 OK response to IBCF_A
53					(_					200 OK	IBCF_A forwards the 200 OK response to IMS_A
54												200 OK	IMS_A forwards the 200 OK response to UE_B
55			-										User B is informed that call has been answered
56												ACK	UE_B acknowledges the receipt of 200 OK for INVITE
57						 ;	•					ACK	IMS_A forwards ACK to IBCF_A

Step						Direc	ction						Message	Comment
	U	7		U	Ū				1	E		A		
	s e	E		s e				B C	B C	N U	M S	S		
	r	'	`	r		Ă		F	F	M	В			
	Α			В				A	В	DB				
58									\rightarrow				ACK	IBCF_A forwards ACK to
59													ACK	IBCF_B IBCF_B forwards ACK to IMS_B
60											\neg		ACK	IMS_B forwards ACK to IMS_B
00												\longrightarrow	ACK	AS
61											_		ACK	IMS_B AS forwards, possibly
														modified, ACK to IMS_B
62									\leftarrow	_ _			ACK	IMS_B forwards ACK to IBCF_B
63								\leftarrow					ACK	IBCF_B forwards ACK to IBCF_A
64								_					ACK	IBCF_A forwards ACK to IMS_A
65						_[`							ACK	IMS A forwards ACK to UE A
66	,		•											User A is informed that the call
														is established
67	-	\longrightarrow												User A ends call
68				-	_	≯							BYE	UE_A releases the call with BYE
69							•						BYE	IMS_A forwards BYE to IMS_A
70													BYE	AS IMS_A AS forwards, possibly
70						K	_						BIL	modified, BYE to IMS_A
71							 	•					BYE	IMS_A forwards BYE to IBCF_A
72									→				BYE	IBCF_A forwards BYE to
70													D)/E	IBCF_B
73										_ _	\rightarrow		BYE BYE	IBCF_B forwards BYE to IMS_B
74												\longrightarrow	BAE	IMS_B forwards BYE to IMS_B AS
75													BYE	IMS_B AS forwards BYE to
														IMS_B
76									\leftarrow	_ _			BYE	IMS_B forwards BYE to IBCF_B
77								<u></u>					BYE	IBCF_B forwards BYE to
78								_					BYE	IBCF_A IBCF_A forwards BYE to IMS_A
79													BYE	IMS A forwards BYE to UE B
80													B12	User B is informed that call has
				\leftarrow										ended
81						≯							200 OK	UE_B sends 200 OK for BYE
82							 	•					200 OK	IMS_A forwards 200 OK
83													200 OK	response to IBCF_A IBCF A forwards 200 OK
03									\rightarrow				200 OK	response to IBCF_B
84													200 OK	IBCF_B forwards 200 OK
										_	7		222 011	response to IMS_B
85											\vdash	\longrightarrow	200 OK	IMS_B forwards 200 OK response to IMS_B AS
86													200 OK	IMS_B AS forwards, possibly
											←		200 011	modified, 200 OK response to
														IMS_B
87									\leftarrow				200 OK	IMS_B forwards 200 OK
88								1.					200 OK	response to IBCF_B IBCF_B forwards 200 OK
								\leftarrow	-					response to IBCF_A
89						<u></u>		_					200 OK	IBCF_A forwards 200 OK
													200 014	response to IMS_A
90			\leftarrow	-	-	-							200 OK	IMS_A forwards 200 OK response to UE_A
91														User A is informed that call has
	_													ended

4.4.9 Supplementary Service HOLD

4.4.9.1 Description

 UE_A places an IMS VoIP call to UE_B which places the call on HOLD. UE_A will be notified by the AS that the call is on hold. UE_B will resume the call, and UE_A will be informed by the AS that the call is resumed.

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

Step	Action	CF_INT_AS	CF_ROAM_AS
1	User A calls User B	1	1
2	User B is informed of incoming call of User A	14	20
3	User A is informed that UE_B is ringing	20	29
4	User B answers call	21	30
5	User A is informed that call has been answered	27	39
6	User B is informed that call is established	33	48
7	User B puts call on hold	34	49
8	User A is informed that call on hold with AS	49	70
	tone		
9	User B is informed that call on hold	57	81
10	User B resumes call	65	92
11	User B is informed that call is resumed	87	123
12	User A is informed that call is resumed	95	134
13	User A ends call	96	135
14	User B is informed that call has ended	102	144
15	User A is informed that call has ended	108	153

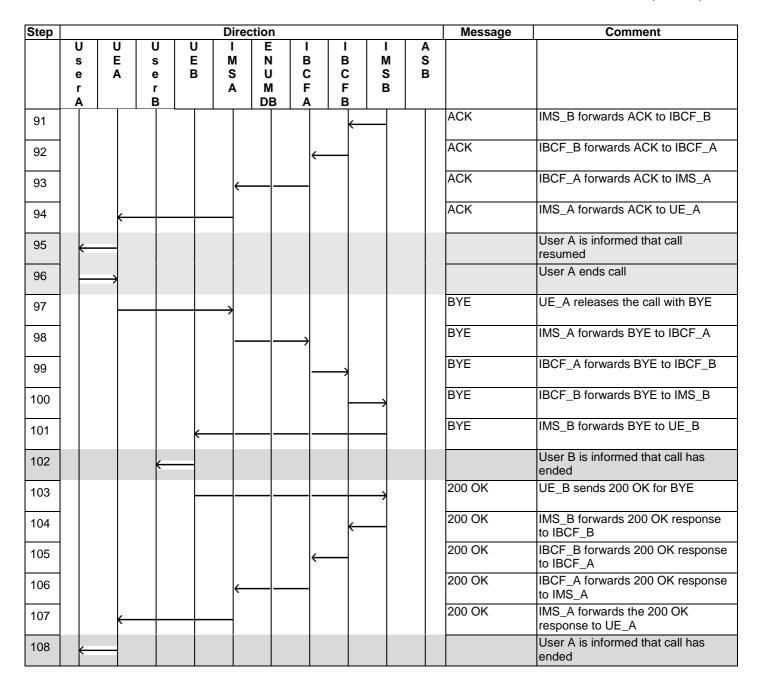
4.4.9.1.1 UC_10_I: SIP Call Flow "call hold and resume with AS tone" using reINVITE with CF_INT_AS

Step					Direc	ction					Message	Comment
•	U s e r A	U E A	U s e r B	U E B	I M S A	E N U M DB	I B C F A	I B C F B	M S B	A S B		
1		—										User A calls User B
2											INVITE	UE_A sends INVITE with the first SDP offer indicating all desired media and codecs that UE_A supports
3		←									100 Trying	IMS_A responds with a 100 Trying provisional response
4					_	\rightarrow					ENUM	IMS_A sends query to ENUM DB
5					\leftarrow	-					ENUM	ENUM DB sends response to IMS_A
6					_		\longrightarrow				INVITE	IMS_A forwards INVITE to IBCF_A
7					\leftarrow						100 Trying	IBCF_A responds with a 100 Trying provisional response
8								\rightarrow			INVITE	IBCF_A forwards INVITE to IBCF_B
9							\leftarrow				100 Trying	IBCF_B responds with a 100 Trying provisional response
10									\rightarrow		INVITE	IBCF_B forwards INVITE to IMS_B

Step						irection						Message	Comment
	U s	O E		J L S E	E N		I B	I	3	I M	A S		
	e r	A	ı	r	3 8	M A	F	F	=	S B	В		
11	A		E	3 <u> </u> 		DB	A	E	3 ←			100 Trying	IMS_B responds with a 100 Trying provisional response
12					.							INVITE	IMS_B forwards INVITE to UE_B
13										\rightarrow		100 Trying	UE_B optionally responds with a 100 Trying provisional response
14				(User B is informed of incoming call of User A
15										\rightarrow		180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting
16												180 Ringing	IMS_B forwards the 180 Ringing response to IBCF_B
17									_			180 Ringing	IBCF_B forwards the 180 Ringing response to IBCF_A
18												180 Ringing	IBCF_A forwards the 180 Ringing response to IMS_A
19		•										180 Ringing	IMS_A forwards the 180 Ringing response to UE_A
20	←												User A is informed that UE_B is ringing
21				\longrightarrow									User B answers call
22										\rightarrow		200 OK	UE_B responds to INVITE with 200 OK to indicate that the call has been answered
23									\leftarrow			200 OK	IMS_B forwards 200 OK response to IBCF_B
24									_			200 OK	IBCF_B forwards 200 OK response to IBCF_A
25						-						200 OK	IBCF_A forwards 200 OK response to IMS_A
26		•										200 OK	IMS_A forwards the 200 OK response to UE_A
27	←												User A is informed that call has been answered
28					\longrightarrow							ACK	UE_A acknowledges the receipt of 200 OK for INVITE
29							\longrightarrow					ACK	IMS_A forwards ACK to IBCF_A
30									*			ACK	IBCF_A forwards ACK to IBCF_B
31										\rightarrow		ACK	IBCF_B forwards ACK to IMS_B
32										\dashv		ACK	IMS_B forwards ACK to UE_B
33													User B is informed that call is established
34													User B puts call on hold
35										\rightarrow		INVITE	UE_B sends reINVITE message indicating media attribute "sendonly" (Call Hold)
36										\dashv		100 Trying	IMS_B responds with a 100 Trying provisional response

		_				Direc							Message	Comment
	U s e r A	E	: s	s e r	U E B	M S A	E N U M DB	B C F A	,	I B C F B	I M S B	A S B		
37												\rightarrow	INVITE	IMS_B sends reINVITE to AS_B
38											←		100 Trying	AS_B optionally responds with a 100 Trying provisional response
39											\leftarrow		INVITE	AS_B sends reINVITE to IMS_B
40												\rightarrow	100 Trying	IMS_B responds with a 100 Trying provisional response
41										\leftarrow			INVITE	IMS_B forwards reINVITE to IBCF_B
42											\rightarrow		100 Trying	IBCF_B responds with a 100 Trying provisional response
43									\leftarrow	+			INVITE	IBCF_B forwards reINVITE to IBCF_A
44										\rightarrow			100 Trying	IBCF_A responds with a 100 Trying provisional response
45						←							INVITE	IBCF_A forwards reINVITE to IMS_A
46								\longrightarrow					100 Trying	IMS_A responds with a 100 Trying provisional response
47													INVITE	IMS_A forwards reINVITE to UE_A
48						\rightarrow							100 Trying	UE_A optionally responds with a 100 Trying provisional response
49	←													User A is informed that call is on hold with AS tone
50						→							200 OK	UE_A responds to reINVITE with 200 OK indicating media attribute "recvonly"
51								\longrightarrow					200 OK	IMS_A forwards 200 OK response to IBCF_A
52)			200 OK	IBCF_A forwards 200 OK response to IBCF_B
53											\rightarrow		200 OK	IBCF_B forwards 200 OK response to IMS_B
54												\rightarrow	200 OK	IMS_B forwards 200 OK response to AS_B
55											\leftarrow		200 OK	AS_B forwards 200 OK response to IMS_B
56													200 OK	IMS_B forward the 200 OK to UE_B
57				K										User B is informed that the call is on hold
58											\rightarrow		ACK	UE_B acknowledges the receipt of 200 OK for reINVITE
59												\longrightarrow	ACK	IMS_B forwards ACK to AS_B
60											←		ACK	AS_B forwards ACK to IMS_B
61										\leftarrow			ACK	IMS_B forwards ACK to IBCF_B
62									\leftarrow	4			ACK	IBCF_B forwards ACK to IBCF_A
63						\leftarrow							ACK	IBCF_A forwards ACK to IMS_A

Step						Directio	on					Message	Comment
	U s	L			U E		E N	I B	I B	I M	A		
	e r	A	- -	e l r		-		C F	C F	S B	В		
	A			3				A	В		1	ACK	IMS_A forwards ACK to UE_A
64						†						ACK	
65					>								User B resumes call
66										\rightarrow		INVITE	UE_B sends second reINVITE message indicating media attribute "sendrecv" (Call Resume)
67							_					100 Trying	IMS_B responds with a 100 Trying provisional response
68											\longrightarrow	INVITE	IMS_B sends reINVITE to AS_B
69										(100 Trying	AS_B optionally responds with a 100 Trying provisional response
70										←		INVITE	AS_B forwards INVITE to IMS_B
71											\longrightarrow	100 Trying	IMS_B responds with a 100 Trying provisional response
72									←			INVITE	IMS_B sends reINVITE to IBCF_B
73										\rightarrow		100 Trying	IBCF_B responds with a 100 Trying provisional response
74								\leftarrow				INVITE	IBCF_B sends reINVITE to IBCF_A
75									\rightarrow			100 Trying	IBCF_A responds with a 100 Trying provisional response
76							_					INVITE	IBCF_A sends reINVITE to IMS_A
77								>				100 Trying	IMS_A responds with a 100 Trying provisional response
78												INVITE	IMS_A forwards reINVITE to UE_A
79						>						100 Trying	UE_A optionally responds with a 100 Trying provisional response
80						>						200 OK	UE_A sends the 200 OK indicating media attribute "sendrecv" to IMS_A
81								→				200 OK	IMS_A forwards 200 OK response to IBCF_A
82									\rightarrow			200 OK	IBCF_A forwards 200 OK response to IBCF_B
83										\rightarrow		200 OK	IBCF_B forwards 200 OK response to IMS_B
84											\longrightarrow	200 OK	IMS_B forwards 200 OK response to AS_B
85										←		200 OK	AS_B forwards the 200 OK for INVITE
86								-				200 OK	IMS_B forwards 200 OK to UE_B
87				—									User B is informed that call is resumed
88										\rightarrow		ACK	UE_B sends ACK to IMS_B
89											\longrightarrow	ACK	IMS_B forwards ACK to AS_B
90										\leftarrow		ACK	AS_B forwards ACK to IMS_B



4.4.9.1.2 UC_10_R: SIP Call Flow "call hold and resume with AS tone" using reINVITE with CF_ROAM_AS

Step					Dire	ction					Message	Comment
	N o o C	U E A	DøerB	U E B	M S A	E N U M DB	I B C F A	I B C F B	I M S B	A S B		
1		\rightarrow										User A calls User B
2					\rightarrow						INVITE	UE_A sends INVITE with the first SDP offer indicating all desired
3		(100 Trying	IMS_A responds with a 100 Trying provisional response

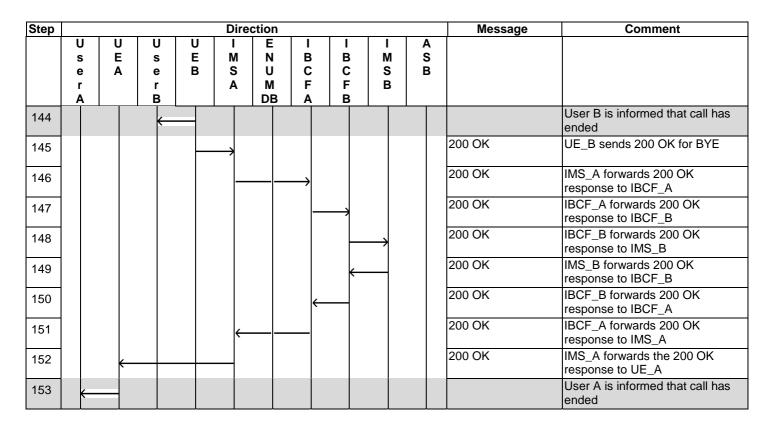
Step				D	irectio						Message	Comment
		_		J 1 ≣ 1	I E VI N		8	I B	I M	A		
	е	Α	e l	3 \$	s U	C	;	С	S	В		
	r A		r B	_ ^	A M			F B	В			
4					\longrightarrow						ENUM	IMS_A sends query to ENUM DB
5											ENUM	ENUM DB sends response to IMS_A
6						\longrightarrow					INVITE	IMS_A forwards INVITE to IBCF_A
7											100 Trying	IBCF_A responds with a 100 Trying provisional response
8								\rightarrow			INVITE	IBCF_A forwards INVITE to IBCF_B
9							\leftarrow				100 Trying	IBCF_B responds with a 100 Trying provisional response
10									\rightarrow		INVITE	IMS_A forwards INVITE to IMS_B
11								\leftarrow			100 Trying	IMS_B responds with a 100 Trying provisional response
12								\leftarrow	-		INVITE	IMS_B forwards INVITE to IBCF_B
13									\rightarrow		100 Trying	IBCF_B responds with a 100 Trying provisional response
14											INVITE	IBCF_B forwards INVITE to IBCF_A
15								\rightarrow			100 Trying	IBCF_A responds with a 100 Trying provisional response
16											INVITE	IBCF_A forwards INVITE to IMS_A
17						\longrightarrow					100 Trying	IMS_A responds with a 100 Trying provisional response
18				←—							INVITE	IMS_A 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 call of User A
21											180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that
22						\longrightarrow					180 Ringing	IMS_A forwards 180 Ringing response to IBCF_A
23								\rightarrow			180 Ringing	IBCF_A forwards 180 Ringing response to IBCF_B
24									\rightarrow		180 Ringing	IBCF_B forwards 180 Ringing response to IMS_B
25								\leftarrow	\dashv		180 Ringing	IMS_B forwards the 180 Ringing response to IBCF_B
26											180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
27											180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
28											180 Ringing	IMS_A forwards the 180 Ringing response to UE_A
29												User A is informed that UE_B is ringing
30												User B answers call
31											200 OK	UE_B responds to INVITE with 200 OK to indicate that the call

Step					Dire	ction					•	Message	Comment
	U s	UE	U	U E	I M	E N	l B	I	3	I M	A S		
	e r	Α	e	В	S	U M	C	F	;	S B	В		
	Ą		В			DB	A	E					
32							\longrightarrow					200 OK	IMS_A forwards 200 OK response to IBCF_A
33							-		•			200 OK	IBCF_A forwards 200 OK response to IBCF_B
34										\rightarrow		200 OK	IBCF_B forwards 200 OK response to IMS_B
35									\leftarrow			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 the 200 OK response to UE_A
39	←												User A is informed that call has been answered
40					\rightarrow							ACK	UE_A acknowledges the receipt of 200 OK for INVITE
41							\longrightarrow					ACK	IMS_A forwards ACK to IBCF_A
42							-		•			ACK	IBCF_A forwards ACK to IBCF_B
43										\rightarrow		ACK	IBCF_B forwards ACK to IMS_B
44									\leftarrow			ACK	IMS_B forwards ACK to IBCF_B
45							•		-			ACK	IBCF_B forwards ACK to IBCF_A
46					←							ACK	IBCF_A forwards ACK to IMS_A
47				←								ACK	IMS_A forwards ACK to UE_B
48			(User B is informed that call is established
49				\longrightarrow									User B puts call on hold
50				-	\rightarrow							INVITE	UE_B sends reINVITE message indicating media attribute
51				←								100 Trying	IMS_A responds with a 100 Trying provisional response
52							\longrightarrow					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										\rightarrow		INVITE	IBCF_B forwards INVITE to
57												100 Trying	IMS_B responds with a 100 Trying provisional response
58										_	\longrightarrow	INVITE	IMS_B sends reINVITE to AS_B
59										\leftarrow		100 Trying	AS_B optionally responds with a 100 Trying provisional response

Step					D	irectio	n					Message	Comment
	U s	U E	U s	U	I N	ı E		,	I B	I M	A S		
	е	Ā	е	В	S	S U) C	; (С	S	В		
	r A		r B		Α	\ DE			F B	В			
60							•	,		\leftarrow		INVITE	AS_B sends reINVITE to IMS_B
61											\longrightarrow	100 Trying	IMS_B responds with a 100 Trying provisional response
62									\leftarrow			INVITE	IMS_B forwards reINVITE to IBCF_B
63										\rightarrow		100 Trying	IBCF_B responds with a 100 Trying provisional response
64									-			INVITE	IBCF_B forwards reINVITE to IBCF_A
65)			100 Trying	IBCF_A responds with a 100 Trying provisional response
66						\leftarrow						INVITE	IBCF_A forwards reINVITE to IMS_A
67							\longrightarrow					100 Trying	IMS_A responds with a 100 Trying provisional response
68		—										INVITE	IMS_A forwards reINVITE to UE_A
69					\longrightarrow							100 Trying	UE_A optionally responds with a 100 Trying provisional response
70	—												User A is informed that call is on hold with AS tone
71					\longrightarrow							200 OK	UE_A responds to reINVITE with 200 OK indicating media
72							\longrightarrow					200 OK	IMS_A forwards 200 OK response to IBCF_A
73)			200 OK	IBCF_A forwards 200 OK response to IBCF_B
74										\rightarrow		200 OK	IBCF_B forwards 200 OK response to IMS_B
75											\longrightarrow	200 OK	IMS_B forwards 200 OK response to AS_B
76										←		200 OK	AS_B forwards 200 OK response to IMS_B
77									\leftarrow			200 OK	IMS_B forwards 200 OK response to IBCF_B
78												200 OK	IBCF_B forwards 200 OK response to IBCF_A
79												200 OK	IBCF_A forwards 200 OK response to IMS_A
80				+								200 OK	IMS_A forward the 200 OK to UE_B
81			-										User B is informed that the call is on hold
82												ACK	UE_B acknowledges the receipt of 200 OK for reINVITE
83							\longrightarrow					ACK	IMS_A forwards ACK to IBCF_A
84)			ACK	IBCF_A forwards ACK to IBCF_B
85										\rightarrow		ACK	IBCF_B forwards ACK to IMS_B
86											\longrightarrow	ACK	IMS_B forwards ACK to AS_B
87										(ACK	AS_B forwards ACK to IMS_B

	U s e	U E	U	U							Message	Comment
	е		S	Ē	M	E N	I B	l B	I M	A S		
	r	Α	e r	В	SA	U M	C F	C F	S B	В		
	Ā		В			DB	Α	В.			1.01/	1140 D. (
88								\leftarrow			ACK	IMS_B forwards ACK to IBCF_B
89							←				ACK	IBCF_B forwards ACK to IBCF_A
90					\leftarrow		_				ACK	IBCF_A forwards ACK to IMS_A
91		\leftarrow									ACK	IMS_A forwards ACK to UE_A
92			-	\rightarrow								User B resumes call
93				-	\rightarrow						INVITE	UE_B sends second reINVITE message indicating media
94				\leftarrow							100 Trying	IMS_A responds with a 100 Trying provisional response
95							\rightarrow				INVITE	IMS_A sends reINVITE to IBCF_A
96					←						100 Trying	IBCF_A responds with a 100 Trying provisional response
97								\longrightarrow			INVITE	IBCF_A sends reINVITE to IBCF_B
98							\leftarrow				100 Trying	IBCF_B responds with a 100 Trying provisional response
99									\longrightarrow		INVITE	IBCF_B sends reINVITE to IMS_B
100								\leftarrow			100 Trying	IMS_B responds with a 100 Trying provisional response
101										\longrightarrow	INVITE	IMS_B sends reINVITE to AS_B
102									—		100 Trying	AS_B optionally responds with a 100 Trying provisional response
103									←		INVITE	AS_B forwards INVITE to IMS_B
104										\rightarrow	100 Trying	IMS_B responds with a 100 Trying provisional response
105								\leftarrow			INVITE	IMS_B sends reINVITE to IBCF_B
106									\longrightarrow		100 Trying	IBCF_B responds with a 100 Trying provisional response
107							←				INVITE	IBCF_B sends reINVITE to IBCF_A
108								\longrightarrow			100 Trying	IBCF_A responds with a 100 Trying provisional response
109							_				INVITE	IBCF_A sends reINVITE to
110							\rightarrow				100 Trying	IMS_A responds with a 100 Trying provisional response
111		—									INVITE	IMS_A forwards reINVITE to UE_A
112		<u> </u>			\rightarrow						100 Trying	UE_A optionally responds with a 100 Trying provisional response
113		_	\perp		\rightarrow						200 OK	UE_A sends the 200 OK indicating media attribute
114							\rightarrow				200 OK	IMS_A forwards 200 OK response to IBCF_A
115							_	\rightarrow			200 OK	IBCF_A forwards 200 OK response to IBCF_B

116	Step						irectio						Message	Comment
116		U s	U					I E	3		М	A S		
16			Α		В							В		
117										В			300 OK	IRCE R forwards 200 OK
118	116										\rightarrow			response to IMS_B
Novite	117											\rightarrow		response to AS_B
BBCF_B 200 OK BBCF_B forwards 200 OK to BBCF_A BYE BBCF_A forwards 200 OK to BBCF_B BYE BBCF_B forwards 200 OK to BCF_B BYE BBCF_B BYE BBCF_B BYE BBCF_B BYE BBCF_B BYE BBCF_B	118										\leftarrow		200 OK	
IBCF_A	119									←			200 OK	
MS_A	120									+			200 OK	
123 U.E. B User B is informed that call is resumed U.E. B sends ACK to IMS_A	121								-				200 OK	
124	122					(200 OK	
ACK IBCF_A forwards ACK to IBCF_A ACK IBCF_B forwards ACK to IMS_B ACK IBCF_B forwards ACK to IMS_B ACK IMS_B forwards ACK to IMS_B ACK IBCF_A forwards ACK to IBCF_B BCF_B forwards ACK to IMS_A ACK IBCF_A forwards ACK to IBCF_B BCF_B forwards ACK to IBCF_B BYE IBCF_B forwards BYE to IBCF_A BYE IBCF_B forwards BYE to IMS_B BYE IBCF_B forwards BYE to IMS_B BYE IBCF_B forwards BYE to IMS_B BYE IBCF_A forwards BYE to IMS_B BYE IBCF_B forwards BYE to IBCF_B BYE IBCF_A forwards BYE to IMS_B BYE IBCF_A forwards BYE to IMS_A	123			•										
ACK	124												ACK	UE_B sends ACK to IMS_A
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ACK IMS_B forwards ACK to AS_B ACK AS_B forwards ACK to IMS_B ACK IMS_B forwards ACK to IMS_B ACK IMS_B forwards ACK to IBCF_B ACK IBCF_B forwards ACK to IBCF_B ACK IBCF_A forwards ACK to IMS_A ACK IBCF_A forwards ACK to IMS_A ACK IMS_A forwards ACK to IMS_A ACK IMS_A forwards ACK to IMS_A IMS_A forwards ACK to IMS_A IMS_B forwards ACK to IMS_B IMS_B forwards ACK to IMS_B IMS_B forwards BYE to IBCF_A BYE IBCF_B forwards BYE to IBCF_B BYE IBCF_B forwards BYE to IBCF_B BYE IBCF_B forwards BYE to IBCF_B BYE IBCF_A forwards BYE to IBCF_A BYE IBCF_A forwards BYE to IBCF_B	126									\rightarrow			ACK	
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ACK IMS_B forwards ACK to IBCF_B ACK IBCF_B forwards ACK to IBCF_B ACK IBCF_A forwards ACK to IMS_A ACK IMS_A forwards ACK to IMS_A ACK IMS_A forwards ACK to UE_A IMS_B forwards ACK to IMS_A IMS_B forwards ACK to IMS_A ACK IMS_A forwards ACK to UE_A IMS_B forwards ACK to IMS_A IMS_B forwards ACK to IMS_A IMS_B forwards ACK to IMS_A IMS_B forwards ACK to IMS_B IMS_B forwards BYE to IBCF_B IMS_B forwards BYE	128											\longrightarrow	ACK	IMS_B forwards ACK to AS_B
ACK IBCF_B forwards ACK to IBCF_A ACK IBCF_A forwards ACK to IMS_A ACK IBCF_A forwards ACK to IMS_A ACK IMS_A forwards ACK to UE_A User A is informed that call resumed User A ends call User A ends call BYE UE_A releases the call with BYE BYE IBCF_A forwards BYE to IBCF_A BYE IBCF_B forwards BYE to IBCF_B BYE IBCF_A forwards BYE to IBCF_B	129										\leftarrow		ACK	AS_B forwards ACK to IMS_B
132 133 134 135 136 137 138 139 140 141 142 142 IBCF_A forwards ACK to IMS_A ACK IBCF_A forwards ACK to UE_A IMS_A forwards ACK to UE_A User A is informed that call resumed User A ends call User A ends call BYE UE_A releases the call with BYE BYE IBCF_A forwards BYE to IBCF_A BYE IBCF_B forwards BYE to IBCF_B BYE IBCF_A forwards BYE to IBCF_B	130									\leftarrow			ACK	IMS_B forwards ACK to IBCF_B
ACK IBCF_A forwards ACK to IMS_A ACK IMS_A forwards ACK to UE_A IMS_A forwards ACK to UE_A User A is informed that call resumed User A ends call User A ends call BYE UE_A releases the call with BYE BYE IBCF_A forwards BYE to IBCF_A BYE IBCF_B forwards BYE to IBCF_B BYE IBCF_B forwards BYE to IBCF_B BYE IBCF_B forwards BYE to IBCF_B BYE IBCF_A forwards BYE to IBCF_B BYE IBCF_B forwards BYE to IBCF_B BYE IBCF_A forwards BYE to IBCF_B	131									-			ACK	
134 135 136 137 138 139 140 141 142 User A is informed that call resumed User A ends call BYE UE_A releases the call with BYE BYE IBCF_A forwards BYE to IBCF_A BYE IBCF_B forwards BYE to IBCF_B BYE IBCF_B forwards BYE to IBCF_B BYE IBCF_A forwards BYE to IBCF_A BYE IBCF_A forwards BYE to IBCF_A BYE IBCF_A forwards BYE to IBCF_A	132												ACK	
resumed User A ends call BYE UE_A releases the call with BYE BYE IMS_A forwards BYE to IBCF_A BYE IBCF_B forwards BYE to IMS_B BYE IMS_B forwards BYE to IBCF_B BYE IBCF_B forwards BYE to IBCF_B BYE IBCF_B forwards BYE to IBCF_B BYE IBCF_A forwards BYE to IBCF_B	133		+										ACK	IMS_A forwards ACK to UE_A
User A ends call BYE UE_A releases the call with BYE BYE IIMS_A forwards BYE to IBCF_A BYE IBCF_A forwards BYE to IBCF_B BYE IBCF_B forwards BYE to IMS_B BYE IMS_B forwards BYE to IBCF_B BYE IBCF_B forwards BYE to IBCF_B BYE IBCF_A forwards BYE to IMS_A BYE IBCF_A forwards BYE to IMS_A	134	←												
BYE IMS_A forwards BYE to IBCF_A BYE IBCF_A forwards BYE to IBCF_B BYE IBCF_B forwards BYE to IBCF_B BYE IBCF_B forwards BYE to IBCF_B BYE IBCF_B forwards BYE to IBCF_B BYE IBCF_A forwards BYE to IBCF_A BYE IBCF_A forwards BYE to IMS_A	135		\rightarrow											
BYE BYE BYE TO BY BYE TO BY BYE TO BY BYE TO BY BYE TO BYE TO BYE TO BYE TO BYE BYE TO BYE TO BYE TO BYE TO BYE TO BYE TO BYE	136												BYE	UE_A releases the call with BYE
BYE IBCF_B forwards BYE to IMS_B BYE IBCF_B forwards BYE to IBCF_B BYE IBCF_B forwards BYE to IBCF_B BYE IBCF_A forwards BYE to IBCF_A BYE IBCF_A forwards BYE to IMS_A BYE IBCF_A forwards BYE to IMS_A	137												BYE	IMS_A forwards BYE to IBCF_A
BYE IBCF_B forwards BYE to IMS_B BYE IMS_B forwards BYE to IBCF_B BYE IBCF_B forwards BYE to IBCF_B BYE IBCF_A forwards BYE to IMS_A BYE IBCF_A forwards BYE to IMS_A	138									\rightarrow			BYE	
BYE IBCF_B forwards BYE to IBCF_A forwards BYE to IMS_A BYE IBCF_A forwards BYE to IMS_A	139										\rightarrow		BYE	
142 IBCF_A BYE IBCF_A forwards BYE to IMS_A BYE BYE	140									\leftarrow	\blacksquare		BYE	IMS_B forwards BYE to IBCF_B
BYE IBCF_A forwards BYE to IMS_A	141									_			BYE	
BYE IMS_A forwards BYE to UE_B	142												BYE	
	143				ļ								BYE	IMS_A forwards BYE to UE_B



4.4.10 Supplementary Service Call Forward Unconditional (CFU)

4.4.10.1 Description

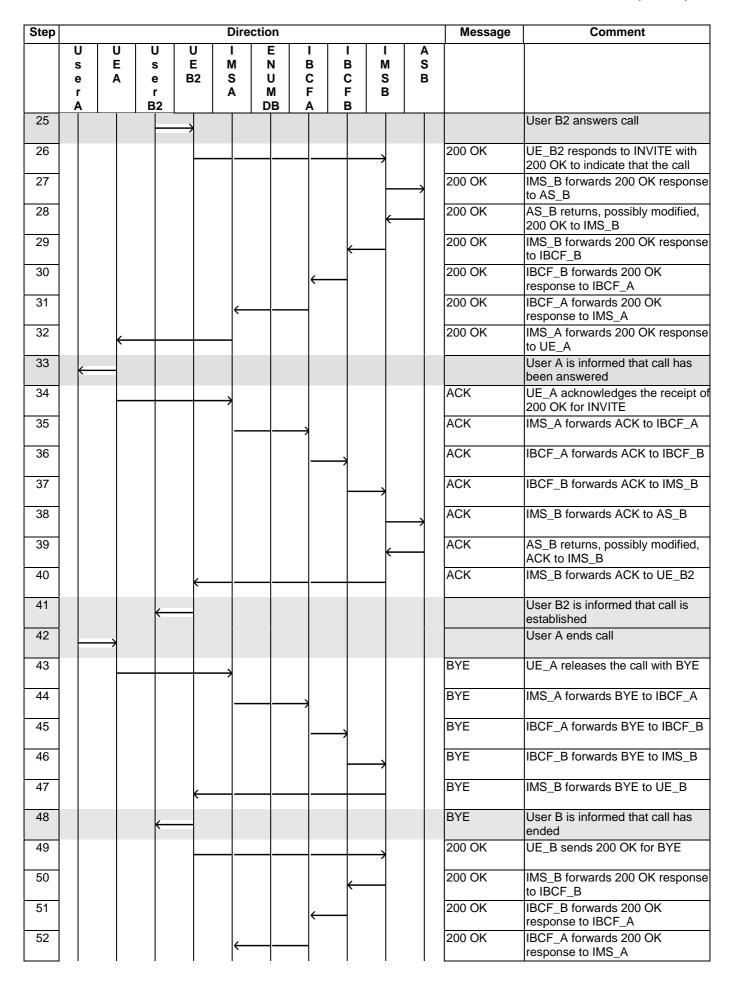
UE_A places an IMS VoIP call to UE_B which has CFU activated towards user UE_B2 which is located in IMS_A. UE_A may be notified by the AS that the call is forwarded. UE_B2 answers the call without previous ringing indication. The call is released by UE_A.

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

Step	Action	CF_INT_AS	CF_ROAM_AS
1	User A calls User B	1	1
2	User A may be informed of call diversion	19	19
3	User B2 is informed of incoming call of User A	24	30
4	User B2 answers call	25	31
5	User A is informed that call has been answered	33	42
6	User B2 is informed that call is established	41	53
7	User A ends call	42	54
8	User B2 is informed that call has ended	48	62
9	User A is informed that call has ended	54	72

4.4.10.1.1 UC_11_I: SIP Call Flow "Communication Forwarding unconditional" with CF_INT_AS

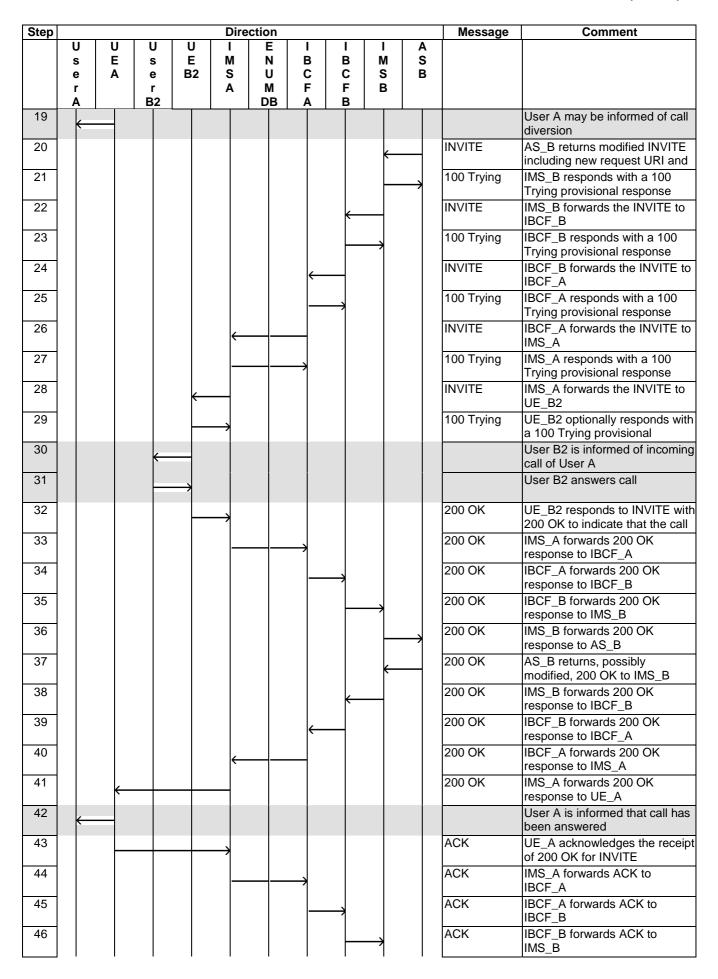
Step			Dir	ection				Message	Comment
	U U s E	U s	U I E M	E N	I B	I B I	I A M S		
	e A	e I	B2 S A	Ü	C	C	S B		
	Å	P2	^	DB	Ā	В			
1	\longrightarrow								User A calls User B
2			 					INVITE	UE_A sends INVITE with the first SDP offer indicating all desired
3				→				ENUM	IMS_A sends query to ENUM DB
4			←					ENUM	ENUM DB sends response to IMS_A
5	←							100 Trying	IMS_A responds with a 100 Trying provisional response
6			_		\rightarrow			INVITE	IMS_A forwards INVITE to IBCF_A
7			←					100 Trying	IBCF_A responds with a 100 Trying provisional response
8						\rightarrow		INVITE	IBCF_A forwards INVITE to IBCF_B
9					←			100 Trying	IBCF_B responds with a 100 Trying provisional response
10						-		INVITE	IBCF_B forwards INVITE to IMS_B
11							-	100 Trying	IMS_B responds with a 100 Trying provisional response
									INVITE triggers the CFU IFC in IMS_B
12								INVITE	IMS_B forwards the INVITE to AS_B
13								100 Trying	AS_B optionally responds with the 100 Trying to IMS_B
									AS_B applies the CDIV CFU procedure
14								181 Call is being	AS_B indicates optionally to IMS_B that call has been
15							1	181 Call is being	IMS_B indicates to IBCF_B that call has been forwarded
16					←	_		181 Call is being	IBCF_B indicates to IBCF_A that call has been forwarded
17			 					181 Call is being	IBCF_A indicates to IMS_A that call has been forwarded
18	├							181 Call is being	IMS_A indicates that call to UE_B has been forwarded
19									User A may be informed of call diversion
20								INVITE	AS_B returns modified INVITE including new request URI and
21								100 Trying	IMS_B responds with a 100 Trying provisional response
22			-					INVITE	IMS_B forwards the INVITE to UE_B2
23								100 Trying	UE_B2 optionally responds with a 100 Trying provisional response
24		(1						User B2 is informed of incoming call of User A



Step					Dire	ection					Message	Comment
	U s e r	U E A	U s e r	U E B2	M S A	E N U M	I B C F	I B C F	M S B	A S B		
	À		B2		'`	DB	A	В				
53		\leftarrow									200 OK	IMS_A forwards 200 OK response to UE_A
54	←											User A is informed that call has ended

4.4.10.1.2 UC_11_R: SIP Call Flow "Communication Forwarding unconditional" with CF_ROAM_AS

Step					Dire	ction						Message	Comment
F	U s e r A	U E A	U s e r B2	U E B2	I M S A	E N U M DB	I B C F A	I B C F B	;	I M S B	A S B		
1		\rightarrow											User A calls User B
2					\rightarrow							INVITE	UE_A sends INVITE with the first SDP offer indicating all
3		←										100 Trying	IMS_A responds with a 100 Trying provisional response
4						\rightarrow						ENUM	IMS_A sends query to ENUM DB
4					\leftarrow							ENUM	ENUM DB sends response to IMS_A
6							\rightarrow					INVITE	IMS_A forwards INVITE to IBCF_A
7					\leftarrow							100 Trying	IBCF_A responds with a 100 Trying provisional response
8								\longrightarrow				INVITE	IBCF_A forwards INVITE to IBCF_B
9							←					100 Trying	IBCF_B responds with a 100 Trying provisional response
10								-)		INVITE	IBCF_B forwards INVITE to IMS_B
11								•	•			100 Trying	IMS_B responds with a 100 Trying provisional response
													INVITE triggers the CFU IFC in IMS_B
12											\rightarrow	INVITE	IMS_B forwards the INVITE to AS_B
13										\leftarrow		100 Trying	AS_B optionally responds with the 100 Trying to IMS_B
													AS_B applies the CDIV CFU procedure
14												181 Call is being	AS_B indicates optionally to IMS_B that call has been
15								€				181 Call is being	IMS_B indicates to IBCF_B that call has been forwarded
16							←					181 Call is being	IBCF_B indicates to IBCF_A that call has been forwarded
17					\leftarrow		\blacksquare					181 Call is being	IBCF_A indicates to IMS_A that call has been forwarded
18		←										181 Call is being	IMS_A indicates that call to UE_B has been forwarded



Step					Directio	n					Message	Comment
					vi i		I B	I B	I M	A S		
	e r		e E r	l l	_		C F	C F	S B	В		
47	A		32					В			1014	1140 P. (
47										\rightarrow	ACK	IMS_B forwards ACK to AS_B
48									\leftarrow		ACK	AS_B returns, possibly modified, ACK to IMS_B
49								\leftarrow			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_B2
53												User B2 is informed that call is established
54		*										User A ends call
55											BYE	UE_A releases the call with BYE
56											BYE	IMS_A forwards BYE to IBCF_A
57)			BYE	IBCF_A forwards BYE to IBCF_B
58									\rightarrow		BYE	IBCF_B forwards BYE to IMS_B
59											BYE	IMS_B forwards BYE to IBCF_B
60											BYE	IBCF_B forwards BYE to IBCF_A
61							-				BYE	IBCF_A forwards BYE to IMS_A
62											BYE	IMS_A forwards BYE to UE_B
63											BYE	User B is informed that call has ended
64				\longrightarrow							200 OK	UE_B sends 200 OK for BYE
65											200 OK	IMS_A forwards 200 OK response to IBCF_A
66								>			200 OK	IBCF_A forwards 200 OK response to IBCF_B
67									\rightarrow		200 OK	IBCF_B forwards 200 OK response to IMS_B
68								-			200 OK	IMS_B forwards 200 OK response to IBCF_B
69								-			200 OK	IBCF_B forwards 200 OK response to IBCF_A
70							-				200 OK	IBCF_A forwards 200 OK response to IMS_A
71		(200 OK	IMS_A forwards 200 OK response to UE_A
72	←											User A is informed that call has ended

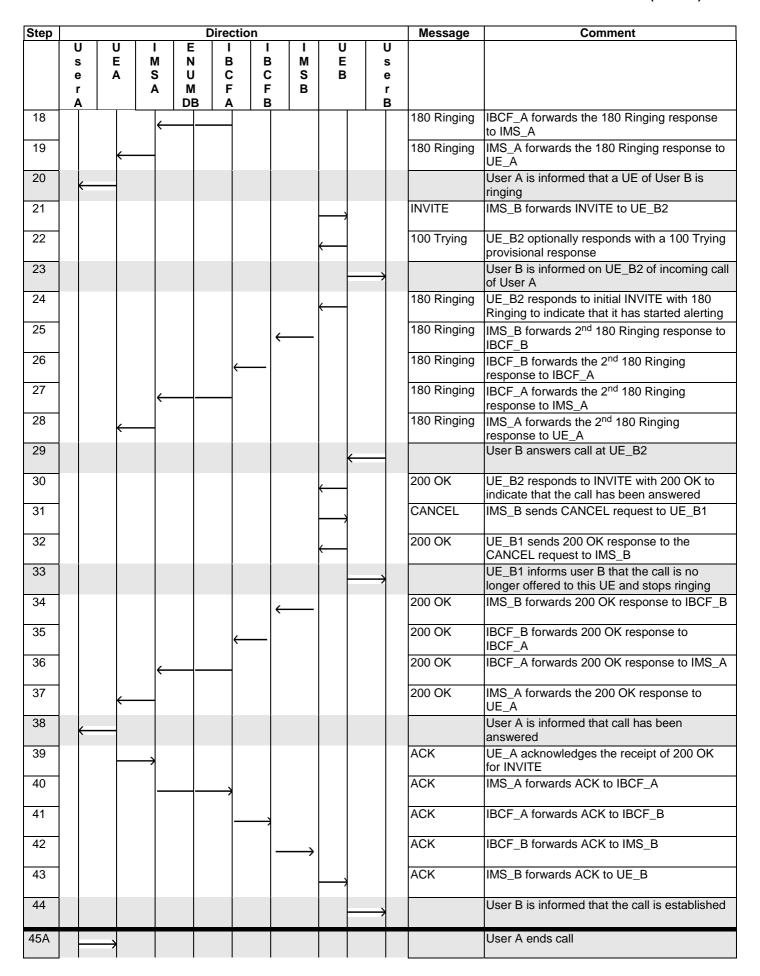
4.4.10.1.3 UC_12: SIP Call Flow "Normal Call" with 2 UEs registered to same public identity

The test sequence and expected call flow sequence when user A calls user B with 2 UEs, i.e. UE_B1 and UEB2, in an interworking scenario is:

Step	Action	CF_INT_CALL
1	User A calls User B	Step 1
2	User B is informed of incoming call of User A on UE_B1	Step 14
3	User B is informed of incoming call of User A on UE_B2	Step 23
4	User A is informed that a UE of User B is ringing	Step 20
5	User B answers call on UE_B2	Step 29
6	User B is informed at UE_B1 that the call is no longer offered	Step 33
7	User A is informed that call has been answered	Step 38
8	User B is informed that the call is established	Step 44
9A	User A ends call	Step 45A
9B	User B ends call	Step 45B
10A	User B is informed that call has ended	Step 51A
10B	User A is informed that call has ended	Step 51B
11A	User A is informed that call has ended	Step 57A
11B	User B is informed that call has ended	Step 57B

Note that steps 6 and 7 may happen in different order.

Step					Directio	n		•		Message	Comment
	U s	U	I M	E N	l B	l B	l M	U E	U s		
	е	A	S	U	С	С	S	В	е		
	r A		Α	M DB	F	F B	В		r B		
1		\rightarrow									User A calls User B
2		-	\rightarrow							INVITE	UE_A sends INVITE with the first SDP offer indicating all desired medias and codecs that
3		\leftarrow								100 Trying	IMS_A responds with a 100 Trying provisional response
4				\rightarrow						ENUM	IMS_A sends query to ENUM DB
5			\leftarrow	_						ENUM	ENUM DB sends response to IMS_A
6					\rightarrow					INVITE	IMS_A forwards INVITE to IBCF_A
7			\leftarrow							100 Trying	IBCF_A responds with a 100 Trying provisional response
8					_	\rightarrow				INVITE	IBCF_A forwards INVITE to IBCF_B
9					←					100 Trying	IBCF_B responds with a 100 Trying provisional response
10						-	\longrightarrow			INVITE	IBCF_B forwards INVITE to IMS_B
11						€				100 Trying	IMS_B responds with a 100 Trying provisional response
12										INVITE	IMS_B forwards INVITE to UE_B1
13								\leftarrow		100 Trying	UE_B1 optionally responds with a 100 Trying provisional response
14									\rightarrow		User B is informed on UE_B1 of incoming call of User A
15										180 Ringing	UE_B1 responds to initial INVITE with 180 Ringing to indicate that it has started alerting
16						€	·			180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
17					←					180 Ringing	IBCF_B forwards the 180 Ringing response to IBCF_A



Step						irect	ion					Message	Comment
	U s	U			E N	I B	I	I M	U		U s		
	е	A		3	U M	C F	C F	S	В		е		
	r A)B	A	В				r B		
46A			\longrightarrow									BYE	UE_A releases the call with BYE
47A						\rightarrow						BYE	IMS_A forwards BYE to IBCF_A
48A						_						BYE	IBCF_A forwards BYE to IBCF_B
49A								\longrightarrow				BYE	IBCF_B forwards BYE to IMS_B
50A									;	*		BYE	IMS_B forwards BYE to UE_B
51A											>		User B is informed that call has ended
52A												200 OK	UE_B sends 200 OK for BYE
53A												200 OK	IMS_B forwards 200 OK response to IBCF_B
54A						+						200 OK	IBCF_B forwards 200 OK response to IBCF_A
55A					-							200 OK	IBCF_A forwards 200 OK response to IMS_A
56A		•										200 OK	IMS_A forwards the 200 OK response to UE_A
57A	←												User A is informed that call has ended
45B										(User B ends call
46B												BYE	UE_B releases the call with BYE
47B												BYE	IMS_B forwards BYE to IBCF_B
48B						+						BYE	IBCF_B forwards BYE to IBCF_A
49B					-							BYE	IBCF_A forwards BYE to IMS_A
50B		•	(BYE	IMS_A forwards BYE to UE_A
51B	←												User A is informed that call has ended
52B												200 OK	UE_A sends 200 OK for BYE
53B						\rightarrow						200 OK	IMS_A forwards 200 OK response to IBCF_A
54B						-						200 OK	IBCF_A forwards 200 OK response to IBCF_B
55B								\longrightarrow				200 OK	IBCF_B forwards 200 OK response to IMS_B
56B									<u> </u>	,		200 OK	IMS_B forwards the 200 OK response to UE_B
57B)		User B is informed that call has ended

4.4.11 Addition of media stream

4.4.11.1 Description

UE_A and UE_B are in an established session with one or more media streams. While in the established session, UE_A adds a new media stream. It is assumed that both UEs are registered in their respective networks.

The test sequence and expected call flow sequence for addition of multimedia stream can be illustrated when adding a new media stream, for example, adding a chat/text session during an existing IMS VoIP call:

Step	Action	CF_INT_CALL
1	User A calls User B	1
2	User B is informed of incoming call of User A	14
3	User A is informed that UE_B is ringing	20
4	User B answers call	21
5	User A is informed that call has been answered	27
6	User B is presented that call is established	33
7A	User A adds a new media stream	34A
7B	User B adds a new media stream	34B
8A	User B may be informed to accept/reject new media stream	45A
8B	User A may be informed to accept/reject new media stream	45B
9A	User A may be informed that UE_B is alerting User B	51A
9B	User B may be informed that UE_A is alerting User A	51B
10A	If informed, User B accepts the new media stream	52A
10B	If informed, User A accepts the new media stream	52B
11A	User A is informed that new media stream has been accepted	58A
11B	User B is informed that new media stream has been accepted	58B
12	User A ends call	64
13	User B is informed that call has ended	70
14	User A is informed that call has ended	76

NOTE: Please note that the call flow sequences described in this clause are not limited to multimedia stream handling scenarios where remote user interaction is required. In other words these call flow sequences may be observed for a call scenario where remote user interaction is not invoked. For example, these same call flows may apply to a scenario where a user removes the video stream from a multimedia audio+video session (remote user interaction is highly unlikely in this case but the same call flows illustrated in this clause may be observed nevertheless).

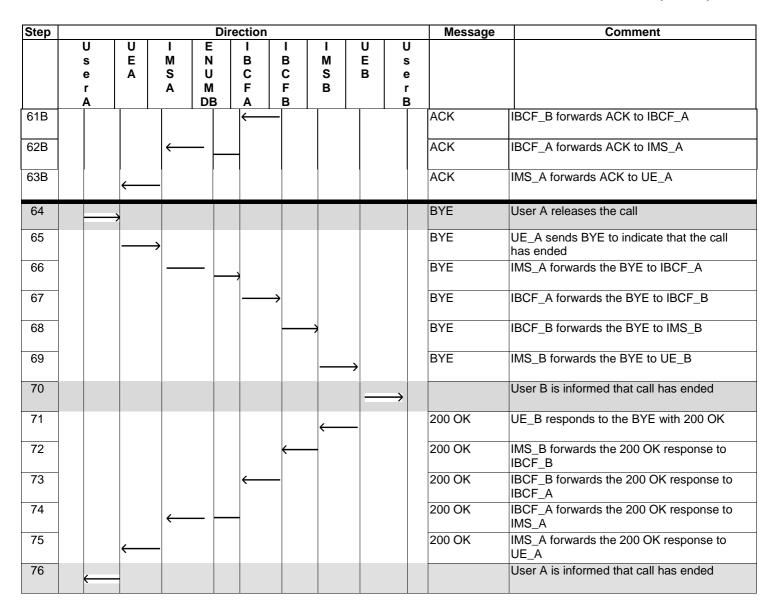
4.4.11.1.1 UC_13: SIP Call Flow "Addition of media stream using reINVITE"

Step				Dii	rection					Message	Comment
	U s e r	U E A	I M S A	E N U M	I B C F	I B C F	M S B	U E B	U s e r		
1	Ă —	*		DB	A	В			В		User A calls User B
2			\rightarrow							INVITE	UE_A sends INVITE with the first SDP offer indicating all desired medias and codecs
3		←	_							100 Trying	IMS_A responds with a 100 Trying provisional response
4				\rightarrow						ENUM	IMS_A sends query to ENUM DB
5			\leftarrow	_						ENUM	ENUM DB sends response to IMS_A
6				_ _	\rightarrow					INVITE	IMS_A forwards INVITE to IBCF_A
7			\leftarrow		_					100 Trying	IBCF_A responds with a 100 Trying provisional response

Step						Direc	ction						Message	Comment
	Us	U		I M	E N		I B	I B	I M	U E	l s			
	е	Ā		S	Ü		C F	C F	S	В	е	•		
	r A			Α	DB		A	В			r E			
8								>					INVITE	IBCF_A forwards INVITE to IBCF_B
9								_					100 Trying	IBCF_B responds with a 100 Trying provisional response
10									>				INVITE	IBCF_B forwards INVITE to IMS_B
11									-				100 Trying	IMS_B responds with a 100 Trying provisional response
12										>			INVITE	IMS_B forwards INVITE to UE_B
13										-			100 Trying	UE_B optionally responds with a 100 Trying provisional response
14										-	\rightarrow			User B is informed of incoming call of User A
15													180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started
16									-				180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
17								-					180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
18				←	- -								180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
19		\leftarrow											180 Ringing	IMS_A forwards the 180 Ringing response to UE_A
20	←	-												User A is informed that UE_B is ringing
21										←	_			User B answers call
22										-			200 OK	UE_B responds INVITE with 200 OK to indicate that the call has been answered
23									-				200 OK	IMS_B forwards 200 OK response to IBCF_B
24								-					200 OK	IBCF_B forwards 200 OK response to IBCF_A
25				←	_ -								200 OK	IBCF_A forwards 200 OK response to IMS_A
26		\leftarrow											200 OK	IMS_A forwards 200 OK response to UE_A
27	(User A is informed that call has been answered
28			\rightarrow										ACK	UE_A acknowledges the receipt of 200 OK for INVITE
29					- -	\longrightarrow							ACK	IMS_A forwards ACK to IBCF_A
30								>					ACK	IBCF_A forwards ACK to IBCF_B
31													ACK	IBCF_B forwards ACK to IMS_B
32										>			ACK	IMS_B forwards ACK to UE_B
33											\rightarrow			User B is informed that the call is established
34A		\rightarrow												User A adds a new media stream
35A			\rightarrow										INVITE	UE_A sends reINVITE message with new media stream in SDP

Step					Direct	tion					Message	Comment
	U	Ū	I	Е		I	I	I	U	U		
	s e	E A	M S	N U			B C	M S	E B	s e		
	r A		Α	M DB			F B	В		r B		
36A				DB	-	4	Б				100 Trying	IMS_A responds with a 100 Trying provisional response
37A				_							INVITE	IMS_A forwards INVITE to IBCF_A
38A			←	_							100 Trying	IBCF_A responds with a 100 Trying provisional response
39A					-	\longrightarrow					INVITE	IBCF_A forwards INVITE to IBCF_B
40A					•	(100 Trying	IBCF_A responds with a 100 Trying provisional response
41A								>			INVITE	IBCF_B forwards INVITE to IMS_B
42A											100 Trying	IMS_B responds with a 100 Trying provisional response
43A											INVITE	IMS_B forwards INVITE to UE_B
44A								\leftarrow			100 Trying	UE_B optionally responds with a 100 Trying provisional response
45A									_	\rightarrow		Verify that User B is informed to accept/reject new media stream (optional)
46A											180 Ringing	UE_B responds to reINVITE with 180 Ringing
47A							←				180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
48A					€						180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
49A			←	_							180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
50A			_								180 Ringing	IMS_A forwards the 180 Ringing response to UE_A
51A												Verify that User A is informed that UE_B is alerting User B (optional)
52A									←	_		If informed, User B accepts the new media stream
53A								-			200 OK	UE_B responds with 200 OK to reINVITE
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			←	_	\dashv						200 OK	IBCF_A forwards 200 OK response to IMS_A
57A			-								200 OK	IMS_A forwards the 200 OK response to UE_A
58A	-											User A is informed that new media stream has been accepted
59A			>								ACK	UE_A acknowledges the receipt of 200 OK for INVITE
60A				$- \mid$	\rightarrow						ACK	IMS_A forwards ACK to IBCF_A
61A					-	\longrightarrow					ACK	IBCF_A forwards ACK to IBCF_B
62A								*			ACK	IBCF_B forwards ACK to IMS_B

Step					Dire	ction					essage	Comment
	U s e r A	U E A	I M S A	E N U M DE	ı	I B C F A	I B C F B	I M S B	U UE SEB FEB] i		
63A				·	·	·				ACK		IMS_B forwards ACK to UE_B
34B												User B adds a new media stream
35B										INVIT	Έ	UE_B sends reINVITE message with new media stream in SDP
36B								\longrightarrow		100 T	rying	IMS_B responds with a 100 Trying provisional response
37B										INVIT	Έ	IMS_B forwards INVITE to IBCF_B
38B							\longrightarrow			100 T	rying	IBCF_B responds with a 100 Trying provisional response
39B						\leftarrow	_			INVIT	Έ	IBCF_B forwards INVITE to IBCF_A
40B							>			100 T	rying	IBCF_A responds with a 100 Trying provisional response
41B			←							INVIT	Έ	IBCF_A forwards INVITE to IMS_A
42B			-		>					100 T	rying	IMS_A responds with a 100 Trying provisional response
43B			_							INVIT	Έ	IMS_A forwards INVITE to UE_A
44B			>							100 T	rying	UE_A optionally responds with a 100 Trying provisional response
45B		-										Verify that User A is informed to accept/reject new media stream (optional)
46B			>							180 R	Ringing	UE_A responds to reINVITE with 180 Ringing
47B					<u>;</u>					180 F	Ringing	IMS_A forwards 180 Ringing response to IBCF_A
48B							•			180 F	Ringing	IBCF_A forwards 180 Ringing response to IBCF_B
49B							\longrightarrow			180 F	Ringing	IBCF_B forwards 180 Ringing response to IMS_B
50B								\longrightarrow		180 F	Ringing	IMS_B forwards the 180 Ringing response to UE_B
51B												Verify that User B is informed that UE_A is alerting User A (optional)
52B		>										If informed, User A accepts the new media stream
53B			→							200 C	OK	UE_A responds with 200 OK to reINVITE
54B			-							200 C	ЭK	IMS_A forwards 200 OK response to IBCF_A
55B							•			200 C	OK	IBCF_A forwards 200 OK response to IBCF_B
56B							\longrightarrow			200 C	DΚ	IBCF_B forwards 200 OK response to IMS_B
57B								\longrightarrow		200 C	OK	IMS_B forwards the 200 OK response to UE_B
58B									$ \longrightarrow $			User B is informed that new media stream has been accepted
59B										ACK		UE_B acknowledges the receipt of 200 OK for INVITE
60B								1		ACK		IMS_B forwards ACK to IBCF_B



4.4.12 Removal of media stream

4.4.12.1 Description

UE_A and UE_B are in an established session with multiple media streams. While in the established session, UE_A removes a media stream. It is assumed that both UEs are registered in their respective networks.

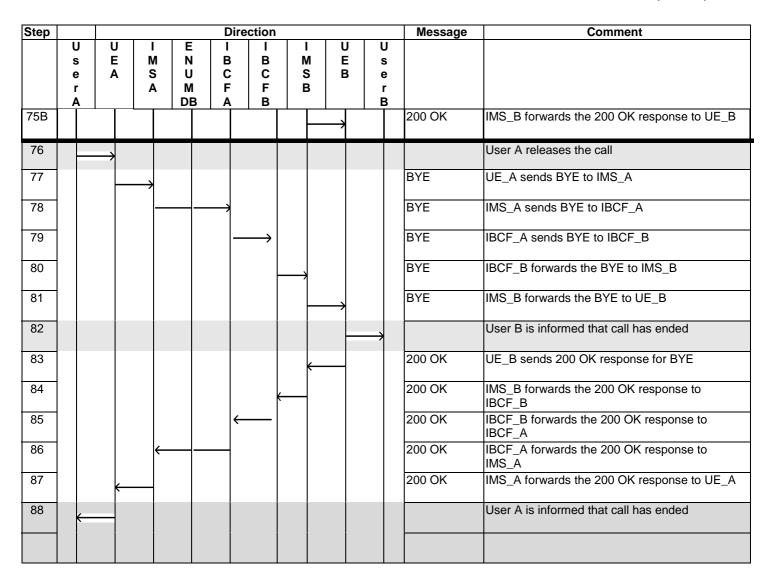
The test sequence and expected call flow sequence for multimedia session handling (when remote user interaction shall be avoided) can be illustrated when removing a media stream from a multimedia session with multiple streams (e.g. remove the chat/text stream from an IMS VoIP + chat multi-stream session):

Step	Action	CF_INT_CALL Using UPDATE	CF_INT_CALL Using reINVITE
1	User A initiates a multimedia session with at least two streams with User B	1	1
2A	User A removes one of the media streams	64A	64A
2B	User B removes one of the media streams	64B	64B
3A	User B is informed that the media stream has been removed	70A	75A
3B	User A is informed that the media stream has been removed	70B	75B
4	User A releases the call	76	86
5	User B is informed that call has ended	82	92
6	User A is informed that call has ended	88	98

NOTE: Please note that the call flow sequences described in this clause depict multimedia streaming handling scenarios where remote user interaction is not invoked. For example, remote user interaction is highly unlikely in an IMS VoIP audio session where a user decides to switch to some other audio codec.

4.4.12.1.1 UC_14: SIP Call Flow "Removal of media streams using UPDATE"

U S E M N B B M E S E T N DB A B B B M E S E E S E E E E E E E E E E E E E E	ssion with at
64A User A removes one of the medi UPDATE UE_A sends UPDATE to IMS_A	ssion with at
65A UPDATE UE_A sends UPDATE to IMS_A	
	ia streams
66A UPDATE IMS_A forwards the UPDATE to	
	IBCF_A
67A UPDATE IBCF_A forwards the UPDATE to	o IBCF_B
68A UPDATE IBCF_B forwards the UPDATE to	o IMS_B
69A UPDATE IMS_B forwards the UPDATE to	
User B is informed that the medi been removed	
71A 200 OK UE_B responds with 200 OK to U	UPDATE
72A 200 OK IMS_B forwards 200 OK respons	se to IBCF_B
73A 200 OK IBCF_B forwards 200 OK respon	nse to IBCF_A
74A 200 OK IBCF_A forwards 200 OK respon	nse to IMS_A
75A 200 OK IMS_A forwards the 200 OK resp	ponse to UE_A
User B removes one of the medi	ia streams
65B UPDATE UE_B sends UPDATE to IMS_B	
66B UPDATE IMS_B forwards the UPDATE to	IBCF_B
67B UPDATE IBCF_B forwards the UPDATE to	o IBCF_A
68B UPDATE IBCF_A forwards the UPDATE to	o IMS_A
69B UPDATE IMS_A forwards the UPDATE to	UE_A
User A is informed that the medi been removed	ia stream has
71B 200 OK UE_A responds with 200 OK to to	UPDATE
72B 200 OK IMS_A forwards the 200 OK responsible to the control of	ponse to
73B 200 OK IBCF_A forwards the 200 OK res	sponse to
74B 200 OK IBCF_B forwards the 200 OK res	sponse to



4.4.12.1.2 UC_15: SIP Call Flow "Removal of media streams using reINVITE"

Step					Dire	ction				Message	Comment
	U s e r A	U E A	M S A	E N U M DB	I B C F A	I B C F B	I M S B	U E B	U s e r B		
1		\rightarrow									User A initiates a multimedia session with at least two streams with User B
64A		\rightarrow									User A removes one of the media streams
65A		_	\longrightarrow							INVITE	UE_A sends reINVITE to IMS_A
66A		_								100 Trying	IMS_A responds with a 100 Trying provisional response
67A			-		\longrightarrow					INVITE	IMS_A forwards the reINVITE to IBCF_A
68A			\leftarrow							100 Trying	IBCF_A responds with a 100 Trying provisional response
69A					-	\longrightarrow				INVITE	IBCF_A forwards the reINVITE to IBCF_B
70A					←					100 Trying	IBCF_B responds with a 100 Trying provisional response
71A						-	\longrightarrow			INVITE	IBCF_B forwards the reINVITE to IMS_B
72A						(100 Trying	IMS_B responds with a 100 Trying provisional response

Step					Dire	ection				Message	Comment
	U	U	I	Е	T	I	I	U	U	9-	
	S	E	M	N	В	В	M	E	S		
	e r	Α	S	U M	C	C F	S B	В	e r		
	A		^	DB	A	В			В		
73A							<u> </u>	\rightarrow		INVITE	IMS_B forwards the reINVITE to UE_B
74A							←			100 Trying	UE_B optionally responds with a 100 Trying
75.0							`				provisional response
75A									\rightarrow		User B is informed that the media stream has been removed
76A							←			200 OK	UE_B responds with 200 OK to reINVITE
77A							,			200 OK	IMS_B forwards the 200 OK response to
							`				IBCF_B
78A					←					200 OK	IBCF_B forwards the 200 OK response to IBCF_A
79A			←							200 OK	IBCF_A forwards the 200 OK response to
. 07 1											IMS_A
80A		\leftarrow								200 OK	IMS_A forwards the 200 OK response to UE_A
81A			\longrightarrow							ACK	UE_A acknowledges the receipt of 200 OK for
82A										ACK	reINVITE IMS_A forwards the ACK to IBCF_A
83A										ACK	IBCF_A forwards the ACK to IBCF_B
84A										ACK	IBCF_B forwards the ACK to IMS_B
85A							<u> </u>	\rightarrow		ACK	IMS_B forwards the ACK to UE_B
64B								←			User B removes one of the media streams
65B							←	`		INVITE	UE_B sends reINVITE to IMS_B
66B										100 Trying	IMS_B responds with a 100 Trying provisional
											response
67B							\leftarrow			INVITE	IMS_B forwards the reINVITE to IBCF_B
68B										100 Trying	IBCF_B responds with a 100 Trying provisional response
69B					- ←					INVITE	IBCF_B forwards the reINVITE to IBCF_A
70B										100 Trying	IBCF_A responds with a 100 Trying provisional
										, ,	response
71B			\leftarrow							INVITE	IBCF_A forwards the reINVITE to IMS_A
72B					\longrightarrow					100 Trying	IMS_A responds with a 100 Trying provisional
73B		_								INVITE	response IMS_A forwards the reINVITE to UE_A
74B		Ì								100 Trying	UE_A optionally responds with a 100 Trying
			\rightarrow							, ,	provisional response
75B	\leftarrow										User A is informed that the media stream has
76B										200 OK	been removed UE_A responds with 200 OK to reINVITE
77B										200 OK 200 OK	IMS_A forwards the 200 OK response to
					1						IBCF_A
78B					[-	\longrightarrow				200 OK	IBCF_A forwards the 200 OK response to
700										200 OK	IBCF_B
79B							\longrightarrow			200 OK	IBCF_B forwards the 200 OK response to IMS_B
80B							<u> </u>	\rightarrow		200 OK	IMS_B forwards the 200 OK response to UE_B
81B										ACK	UE_B acknowledges the receipt of 200 OK for
										1015	reINVITE
82B										ACK	IMS_B forwards ACK to IBCF_B
83B					←					ACK	IBCF_B forwards ACK to IBCF_A
84B 85B										ACK ACK	IIBCF_A forwards ACK to IMS_A IMS_A forwards ACK to UE_A
\vdash										ACK	
86		\rightarrow								BYE	User A releases the call UE_A sends BYE to IMS_A
87 88										BYE	IMS_A forwards BYE to IBCF_A
89										BYE	IBCF_A forwards BYE to IBCF_B
90						7				BYE	IBCF_B forwards BYE to IMS_B
91								\rightarrow		BYE	IMS_B forwards BYE to UE_B
	I	I	I	I	ļ		ı	-1	J		

Step			Direction									Message	Comment
	U s e r A	E		I M S A	E N U M DB	I B C F A	I B C F B	M S B	;	U E B	U s e r B		
92							•			-	\rightarrow		User B is informed that call has ended
93								•	(-		200 OK	UE_B sends 200 OK for BYE
94							•	(200 OK	IMS_B forwards the 200 OK response to IBCF_B
95							←					200 OK	IBCF_B forwards the 200 OK response to IBCF_A
96				\leftarrow								200 OK	IBCF_A forwards the 200 OK response to IMS_A
97			\leftarrow	-								200 OK	IMS_A forwards the 200 OK response to UE_A
98	+												User A is informed that call has ended

4.4.13 Ad-hoc Conferencing service

4.4.13.1 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	Step 33
	the Conference Call	
6	User A is notified that User B is being invited to join the call	Step 41
7	User B joins the conference	Step 48
8	User A is notified that User B has joined the conference	Step 57
9	User B leaves the conference	Step 60
10	User B is informed that the conference has ended	Step 71
11	User A is notified that user B has left the conference	Step 74

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 3rd party IMS core via ISC interface.

4.4.13.2 UC_16: SIP Call Flow "Ad-hoc Conference call"

Step			•		Direction						Message	Comment
	U s	U E	U s	U I	I E	AS	I B	l B	I M	A S		
	е	Ā	е	В	U	Ā	С	С	S	В		
	r A		r B	A	M DB		F	F B	В			
1		→										User A initiates an ad-hoc conference call
2				\longrightarrow							INVITE	UE_A sends INVITE to IMS_A with information for all commonly
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						\longrightarrow					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		\leftarrow									200 OK	IMS_A forwards the 200OK response to UE_A
9	←											User A is informed the Ad Hoc Conference Call is established
10				\longrightarrow							ACK	UE_A acknowledges the receipt of 200 OK for INVITE
11						\rightarrow					ACK	IMS_A forwards the ACK to IMS_A AS
12		\rightarrow										User A invites user B to join the ad-hoc conference call
13				\longrightarrow							REFER	UE_A sends REFER message to IMS_A, with Refer-To: <ue_b td="" uri<=""></ue_b>
14						\rightarrow					REFER	IMS_A forwards the REFER to IMS_A AS
15					←						202 Accepted	IMS_A AS responds with a 202 Accepted
16		\leftarrow									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
18		\leftarrow									NOTIFY	IMS_A forwards the NOTIFY to UE_A
19				\longrightarrow							200 OK	UE_A responds with 200 OK to IMS_A
20					—	\rightarrow					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
22						\rightarrow					100 Trying	IMS_A responds with a 100 Trying provisional response
23					\longrightarrow						ENUM	IMS_A sends query to ENUM DB
24					←						ENUM	ENUM DB sends response to IMS_A
25							→				INVITE	IMS_A forwards the INVITE to IBCF_A
26					←						100 Trying	IBCF_A responds with a 100 Trying provisional response

Step				C	irection					Message	Comment
	U s	U		U I E M	E N	A S	I B	I I B M	A S		
	е	Ā	е	B S	U	A	С	C S	В		
	r A		r B	A	M DB		F	F B			
27										INVITE	IBCF_A forwards the INVITE to IBCF_B
28										100 Trying	IBCF_B responds with a 100 Trying provisional response
29								\longrightarrow		INVITE	IBCF_B forwards the INVITE to IMS_B
30								←		100 Trying	IMS_B responds with a 100 Trying provisional response
31										INVITE	IMS_B forwards the INVITE to UE_B
32										100 Trying	UE_B responds with a 100 Trying provisional response
33				-							User B is informed of incoming invitation from User A to join the
34										180 Ringing	UE_B sends a 180 ringing to IMS_B
35								←		180 Ringing	IMS_B forwards the 180 ringing to IBCF_B
36							•			180 Ringing	IBCF_B forwards the 180 ringing to IBCF_A
37										180 Ringing	IBCF_A forwards the 180 ringing to IMS_A
38				-		\rightarrow				180 Ringing	IMS_A forwards the 180 ringing to IMS_A AS
39					-					NOTIFY	Upon reception of 180 Ringing from UE_B, IMS_A AS sends
40		\leftarrow								NOTIFY	IMS_A forwards the NOTIFY to UE_A
41	←										User A is notified that User B is being invited to join the call
42				\longrightarrow						200 OK	UE_A responds with 200 OK to IMS_A for NOTIFY
43				-		\rightarrow				200 OK	IMS_A forwards the 200 OK response to IMS_A AS
44										200 OK	UE_B responds with 200 OK to IMS_B for INVITE
45								←		200 OK	IMS B forwards the 200 OK response to IBCF_B
46							•	-		200 OK	IBCF_B forwards the 200 OK response to IBCF_A
47						-				200 OK	IBCF_A forwards the 200 OK response to IMS_A
48				-		\rightarrow				200 OK	IMS_A forwards the 200 OK response to IMS_A AS
49				>							User B joins the conference
50										ACK	UE_B acknowledges the 200 OK for INVITE
51								\leftarrow		ACK	IMS B forwards the ACK to IBCF_B
52							•			ACK	IBCF_B forwards the ACK to IBCF_A
53										ACK	IBCF_A forwards the ACK to IMS_A
54				-		\rightarrow				ACK	IMS_A forwards the ACK to IMS_A AS

Step					Dire	ction						Message	Comment
	U s e r A	U E A	U s e r B	U E B	M S A	E N U M DB	A S A	I B C F A	I B C F B	I M S B	A S B		
55					\leftarrow	_						NOTIFY	AS_A sends NOTIFY to UE_A to inform it has successfully joined
56		\leftarrow										NOTIFY	IMS_A forwards NOTIFY to UE_A
57	←												User A is alerted that User B has joined the conference
58				+	\rightarrow							200 OK	UE_A sends 200 OK response for NOTIFY
59						_	\rightarrow					200 OK	IMS_A forwards the 200 OK response to IMS_A AS
60			\vdash	\rightarrow									User B leaves the conference
61						_				\rightarrow		BYE	UE_B sends BYE to IMS_B to leave the conference
62									(BYE	IMS_B forwards the BYE to IBCF_B
63								•				BYE	IBCF_B forwards the BYE to IBCF_A
64					\leftarrow	_						BYE	IBCF_A forwards the BYE to IMS_A
65					_	_	\rightarrow					BYE	IMS_A forwards the BYE to IMS_A AS
66					\leftarrow	_						200 OK	IMS_A AS releases resources for this conference caller and sends a
67					_	_		\longrightarrow				200 OK	IMS_A forwards the 200 OK response to IBCF_A
68									→			200 OK	IBCF_A forwards the 200 OK response to IBCF_B
69										\rightarrow		200 OK	IBCF_B forwards the 200 OK response to IMS_B
70				\leftarrow		_						200 OK	IMS_B forwards the 200 OK response to UE_B
71			←										User B is informed that the conference has ended
72					\leftarrow	_						NOTIFY	AS_A sends NOTIFY to IMS _A to inform UE_A that UE_B has left
73		\leftarrow			\dashv							NOTIFY	IMS_A forwards NOTIFY to UE_A
74	←												User A is notified that user B has left the conference
75					\rightarrow							200 OK	UE_A sends a 200 OK response for NOTIFY
76						_	\rightarrow					200 OK	IMS_A forwards the 200 OK response to IMS_A AS

4.4.14 Presence service

The use case for the presence service is defined in TS 102 901 [17].

4.4.15 IPTV service

4.4.15.1 Broadcast (BC) Session

4.4.15.1.1 Description

UE_A starts a session initiation procedure to join a multicast channel. This test requires the use of application server as specified in [14]. The call flow path and node configuration for this use case corresponds to CF_IPTV.

4.4.15.1.2 UC_19: BC session

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

Step	Action	CF_IPTV
1	User A initiates a BC session	Step 1
2	User A receives the broadcast content	Step 8
3	User A terminates the session	Step 9
4	User A is informed that session is terminated	Step 14

Step				Dire	ction				Message	Comment
	U	U	U	U	I	Α	1	Α		
	S	E	S	E	M	S	M	S		
	е	Α	e	В	S	Α	S B	В		
	r A		r B		A					
1		\rightarrow								User A initiates a BC session
2					\rightarrow				INVITE	UE_A sends INVITE to IMS_A
3						\rightarrow			INVITE	IMS_A forwards the INVITE to AS_A
4					(200 OK	AS_A responds with 200 OK
5		←							200 OK	IMS_A forwards the 200 OK response to UE_A
6					\rightarrow				ACK	UE_A acknowledges the receipt of 200 OK for INVITE
7						\rightarrow			ACK	IMS_A forwards the ACK to AS_A
8	←									User A receives the broadcast content
9		\rightarrow								User A terminates the session
10					\rightarrow				BYE	UE_A sends BYE to IMS_A
11						\rightarrow			BYE	IMS_A forwards the BYE to AS_A
12									200 OK	AS_A responds with 200 OK
13		←							200 OK	IMS_A forwards the 200 OK response to UE_A
14	—									User A is informed that session is terminated

4.4.15.2 Content on Demand (CoD) Session

4.4.15.2.1 Description

UE_A starts a session initiation procedure for a streaming session of a selected content. TS 183 063 [14] specifies two methods for establishing a streaming session (called RTSP Method 1 and 2). This test requires the use of application server, playing the roles of Service control Function (SCF) and Media Function (MF), as specified in [14]. The call flow path and node configuration for this use case corresponds to CF_IPTV.

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

Step	Action	CF_IPTV RTSP Method 1	CF_IPTV RTSP Method 2
1	User A initiates a CoD session (content selection)	Step 1	Step 1
2	User A starts receiving the streaming content	Step 26	Step 14
3	User A terminates the session	Step 27	Step 15
4	User A is informed that session is terminated	Step 36	Step 24

4.4.15.2.2 UC_20: CoD session establishing content control channel and content delivery channels separately (RTSP Method 1)

Step				Dire	ction				Message	Comment
CLOP	U	U	U	U	1	Α	1	Α	mossage	Common
	s	Ē	s	Ē	М	S	M	S		
	е	Α	е	В	S	Α	S	В		
	r		r		Α		В			
	Α		В							
1		\rightarrow								User A initiates a CoD session (content selection)
2					\longrightarrow				INVITE	UE_A sends a INVITE to IMS_A
3						\rightarrow			INVITE	IMS_A forwards the INVITE to AS_A (SCF)
4					←				INVITE	AS_A forwards the INVITE to IMS_A
5						\rightarrow			INVITE	IMS_A forwards the INVITE to AS_A (MF)
6					←				200 OK	AS_A (MF) responds with 200 OK
7						\rightarrow			200 OK	IMS_A forwards the 200 OK response to AS_A (SCF)
8					←				200 OK	AS_A forwards the 200 OK response to IMS_A
9		←							200 OK	IMS_A forwards the 200 OK response to UE_A
10					\rightarrow				ACK	UE_A acknowledges the receipt of 200 OK for INVITE
11						\rightarrow			ACK	IMS_A forwards the ACK to AS_A (SCF)
12					←				ACK	AS_A forwards the ACK to IMS_A
13						\longrightarrow			ACK	IMS_A forwards the ACK to AS_A (MF)
										UE_A sets up RTSP with AS_A (MF)
14					\rightarrow				INVITE	UE_A sends reINVITE message indicating media attribute " a=recvonly "
15						\longrightarrow			INVITE	IMS_A forwards the reINVITE to AS_A (SCF)

Step				Direc	ction				Message	Comment
	U s	U E	U s	U E	I M	A S	I M	A S		
	е	Ā	е	В	S	Ā	S	В		
	r A		r B		Α		В			
16					\leftarrow				INVITE	AS_A forwards the reINVITE to IMS_A
17					_	\rightarrow			INVITE	IMS_A forwards the reINVITE to AS_A (MF)
18					\leftarrow				200 OK	AS_A (MF) responds with 200 OK
19						\rightarrow			200 OK	IMS_A forwards the 200 OK response to AS_A (SCF)
20					\leftarrow				200 OK	IMS_B forwards the 200 OK response to IMS_A
21		\leftarrow							200 OK	IMS_A forwards the 200 OK response to UE_A
22					\rightarrow				ACK	UE_A acknowledges the receipt of 200 OK for reINVITE
23					_	\rightarrow			ACK	IMS_A forwards the ACK to AS_A (SCF)
24					\leftarrow				ACK	AS_A forwards the ACK to IMS_A
25						\rightarrow			ACK	IMS_A forwards the ACK to AS_A (MF)
26	←					-				User A starts receiving the streaming content
27		\rightarrow								User A terminates the session
28					\rightarrow				BYE	UE_A sends a BYE to IMS_A
29						\rightarrow			BYE	IMS_A forwards the BYE to AS_A (SCF)
30					\leftarrow				BYE	AS_A forwards the BYE to IMS_A
31						\rightarrow			BYE	IMS_A forwards the BYE to AS_A (MF)
32					\leftarrow				200 OK	AS_A (MF) responds with 200 OK
33						\rightarrow			200 OK	IMS_A forwards the 200 OK response to AS_A (SCF)
34					←				200 OK	IMS_B forwards the 200 OK response to IMS_A
35		\leftarrow							200 OK	IMS_A forwards the 200 OK response to UE_A
36	—									User A is informed that session is terminated

4.4.15.2.3 UC_21: CoD session establishing content control channel and content delivery channels separately using RTSP Method 2

The expected call flow sequence is:

Step				Dire	ction			Message	Comment	
- 1	U	U	U	U	I	Α	I	Α		
	s	E	s	E	M	S	M	S		
	е	Α	е	В	S	Α	S	В		
	r		r		Α		В			
	A		В							
1		\longrightarrow								User A initiates a CoD session (content
_										selection)
2					\rightarrow				INVITE	UE_A sends a INVITE to IMS_A
3						\longrightarrow			INVITE	IMS_A forwards the INVITE to AS_A (SCF)
4					\leftarrow				INVITE	AS_A forwards the INVITE to IMS_A
5						\longrightarrow			INVITE	IMS_A forwards the INVITE to AS_A (MF)
6					<u> </u>				200 OK	AS_A (MF) responds with 200 OK
7					`				200 OK	IMS_A forwards the 200 OK response to
						\rightarrow				AS_A (SCF)
8					\leftarrow				200 OK	AS_A forwards the 200 OK response to IMS_A
9									200 OK	IMS_A forwards the 200 OK response to
										UE_A
10					\rightarrow				ACK	UE_A acknowledges the receipt of 200 OK for INVITE
11						\longrightarrow			ACK	IMS_A forwards the ACK to AS_A (SCF)
12					\leftarrow				ACK	AS_A forwards the ACK to IMS_A
13						\longrightarrow			ACK	IMS_A forwards the ACK to AS_A (MF)
14										UE_A starts receiving the streaming content
15		\longrightarrow								User A terminates the session
16					\rightarrow				BYE	UE_A sends a BYE to IMS_A
17						\longrightarrow			BYE	IMS_A forwards the BYE to AS_A (SCF)
18	1				\leftarrow				BYE	AS_A forwards the BYE to IMS_A
19	1					\longrightarrow			BYE	IMS_A forwards the BYE to AS_A (MF)
20	1				\leftarrow				200 OK	AS_A (MF) responds with 200 OK
21									200 OK	IMS_A forwards the 200 OK response to
										AS_A (SCF)
22					(200 OK	IMS_B forwards the 200 OK response to IMS_A
23		←			_				200 OK	IMS_A forwards the 200 OK response to UE_A
24	├									User A is informed that session is terminated

4.4.15.3 Request for Network PVR offline capture

4.4.15.3.1 Description

UE_A starts a N-PVR offline capture procedure to record a live programme that has not started yet. Once the capture has finished, UE_A establishes a CoD session to receive the streaming content using RTSP Method 1 or RTSP Method 2. The scope of this Use Case is to describe the capturing procedure, since CoD session is already described in the previous clause. This test requires the use of an application server, as specified in [14]. The call flow path and node configuration for this use case corresponds to CF_IPTV.

4.4.15.3.2 UC_22: Request for Network PVR offline capture.

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_IPTV
1	User A requests to record a live programme that has not started yet	Step 1
2	User A is informed that recording has started	Step 6

The expected call flow sequence is:

Step				Dire	ction					Message	Comment
	U	U	U	U	ı	Α	ı	Α			
	s	E	S	E	M	S	M	S			
	е	Α	е	В	S	Α	S	В			
	r		r		Α		В				
	Α		В								
1											User a requests to record a live
											programme that has not started yet
2					\longrightarrow				MI	ESSAGE	UE_A sends a MESSAGE to IMS_A
3						\longrightarrow			MI	ESSAGE	IMS_A forwards the MESSAGE to AS_A
4					\leftarrow				20	0 OK	AS_A responds with 200 OK
5		,							20	0 OK	IMS_A forwards the 200 OK response to
											UE_A
6											User A is informed that recording has
											started

4.4.16 IMS-PSTN Interoperability

4.4.16.1 IMS-to-PSTN call

4.4.16.1.1 Description

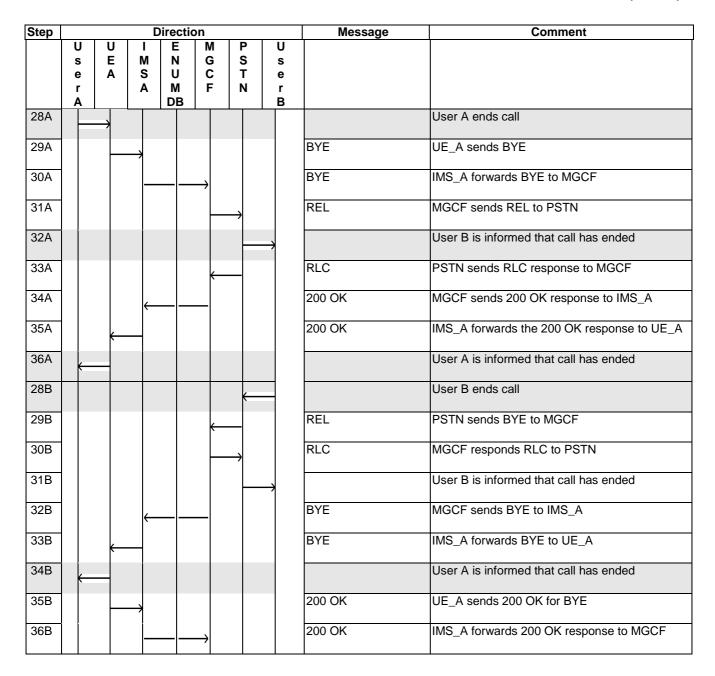
UE_A places an IMS VoIP call to a user that is located in a PSTN environment (UE_B). Once the media path is established, the originating user or the destination user releases the call. The call flow path and node configuration for this use case corresponds to CF_PSTN.

4.4.16.1.2 UC_23: IMS-to-PSTN 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
1	User A calls User B	Step 1
2	User B is informed of incoming call of User A	Step 15
3	User A is informed that UE_B is ringing	Step 19
4	User B answers call	Step 20
5	User A is informed that call has been answered	Step 24
6	User A and B can communicate	Step 27
7	User A ends call	Step 28A
8	User B is informed that call has ended	Step 32A
9	User A is informed that call has ended	Step 36A
10	User B ends call	Step 28B
11	User B is informed that call has ended	Step 31B
12	User A is informed that call has ended	Step 34B

Step		Di	rection	on			Message	Comment
	U U	I	Е	M	Р	U		
	s E e A	M S	N U	G C	S T	s e		
	r A	Α	M DB	F	N	r B		
1								User A calls User B
2		\rightarrow					INVITE	UE_A sends INVITE with the first SDP offer indicating all desired medias and codecs that
3							100 Trying	IMS_A responds with a 100 Trying provisional response
4			\rightarrow				ENUM	IMS_A sends query to ENUM DB
5		\leftarrow	-				ENUM	ENUM DB sends response to IMS_A
6			_	\rightarrow			INVITE	IMS_A forwards INVITE to MGCF
7		←					100 Trying	MGCF responds with a 100 Trying provisional response
8		\leftarrow		_			183 Session Progress	MGCF responds with 183 Session Progress response
9							183 Session Progress	IMS_forwards 183 Session Progress response to UE_A
10		\longrightarrow					PRACK	UE_A sends PRACK to IMS_A
11				\rightarrow			PRACK	IMS_A forwards PRACK to MGCF
12		←					200 OK (PRACK)	MGCF responds with 200 OK response to IMS_A
13							200 OK (PRACK)	IMS_A forwards 200 OK response to UE_A
14					\rightarrow		IAM	MGCF sends IAM to PSTN
15						\rightarrow		User B is informed of incoming call of User A
16				←			ACM/CPG	PSTN responds with ACM/CPG
17		←	_	_			180 Ringing	MGCF sends 180 Ringing response to IMS_A
18							180 Ringing	IMS_A forwards the 180 Ringing response to UE_A
19								User A is informed that UE_B is ringing
20					←			User B answers call
21				\leftarrow			ANM	PSTN sends ANM to MGCF
22		\leftarrow	_	_			200 OK	MGCF sends 200 OK response to IMS_A
23							200 OK	IMS_A forwards 200 OK response to UE_A
24								User A is informed that call has been answered
25		\rightarrow					ACK	UE_A acknowledges the receipt of 200 OK for INVITE
26			_	\rightarrow			ACK	IMS_A forwards ACK to MGCF
27								User A and B can communicate



4.4.16.2 PSTN-to-IMS call

4.4.16.2.1 Description

UE_B that is located in a PSTN environment places a call towards UE_A that is located in the IMS. Once the media path is established, the originating user or the destination user releases the call. The call flow path and node configuration for this use case corresponds to CF_PSTN.

4.4.16.2.2 UC_24: PSTN-to-IMS 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
1	User B calls User A	Step 1
2	User A is informed of incoming call of User B	Step 17
3	User B is informed that UE_A is ringing	Step 21
4	User A answers call	Step 22
5	User A is informed that call has been answered	Step 16
6	User A and B can communicate	Step 28
7	User A ends call	Step 29A
8	User B is informed that call has ended	Step 34A
9	User A is informed that call has ended	Step 37A
10	User B ends call	Step 29B
11	User B is informed that call has ended	Step 32B
12	User A is informed that call has ended	Step 35B

Step			Dir	ectio			Message	Comment
	U s e r A	U E A	M S A	M G C F	P S T N	U s e r B		
1					(User B calls User A
2				←	-		IAM	PSTN send IAM to MGCF
3			←				INVITE	MGCF sends INVITE to IMS_A (SDP with precondition status, MIME subtype "telephone-event" clause 6.4.1)
4				\rightarrow			100 Trying	IMS_A responds with a 100 Trying provisional response
5		\leftarrow					INVITE	IMS_A forwards INVITE to UE_A
6			\rightarrow				100 Trying	UE_A optionally responds with a 100 Trying provisional response
7			\rightarrow				183 Session Progress	UE_A sends 183 Session Progress response to IMS_A
8			_	\rightarrow			183 Session Progress	IMS_A forwards 183 Session Progress response to MGCF
9			\leftarrow	_			PRACK	MGCF responds with PRACK to IMS_A
10		←					PRACK	IMS_A forwards PRACK to UE_A
11			\rightarrow				200 OK (PRACK)	UE_A responds with 200 OK to IMS_A
12			_	\rightarrow			200 OK (PRACK)	IMS_A forwards 200 OK to MGCF
13			\leftarrow				UPDATE	MGCF sends UPDATE to IMS_A
14		\leftarrow	_				UPDATE	IMS_A forwards UPDATE to UE_A
15			\rightarrow				200 OK (UPDATE)	UE_A responds with 200 OK to IMS_A
16			_	\rightarrow			200 OK (UPDATE)	IMS_A forwards 200 OK to MGCF
17	(User A is informed of incoming call of User B

Step			irect			Message	Comment
		J I	M		U s		
		A S	С	T	e		
	r A	Α	F	N	r B		
18		$\stackrel{\square}{\longrightarrow}$				180 Ringing	UE_A responds to initial INVITE with 180 Ringing to indicate that it has started alerting
19		_	\longrightarrow			180 Ringing	IMS_A forwards 180 Ringing response to MGCF
20			-	\longrightarrow		ACM/CPG	MGCF send ACM/CPG to PSTN
21					\rightarrow		User B is informed that UE_A is ringing
22	$ \longrightarrow$						User A answers the call
23		\longrightarrow				200 OK	UE_A responds INVITE with 200 OK to indicate that the call has been answered
24		_	\longrightarrow			200 OK	IMS_A forwards 200 OK response to MGCF
25			-	\longrightarrow		ANM	MGCF sends ANM to PSTN
26		←				ACK	MGCF sends ACK to PSTN
27						ACK	IMS_A forwards ACK to UE_A
28	—						User A and B can communicate
29A	$ \hspace{.05cm} \longmapsto$						User A ends call
30A						BYE	UE_A releases the call with BYE
31A		_	\longrightarrow			BYE	IMS_A forwards BYE to MGCF
32A			-	\longrightarrow		REL	MGCF sends REL to PSTN
33A			•	<u> </u>		RLC	PSTN sends response RLC to MGCF
34A				H	\rightarrow		User B is informed that call has ended
35A		←				200 OK	MGCF sends 200 OK response to IMS_A
36A						200 OK	IMS_A forwards the 200 OK response to UE_A
37A	—						User A is informed that call has ended
29B				←			User B ends call
30B			•			REL	PSTN sends REL to MGCF
31B			-	$\longrightarrow \mid$		RLC	MGCF sends RLC to PSTN
32B					\rightarrow		User B is informed that call has ended
33B		←				BYE	MGCF sends BYE to IMS_A
34B						BYE	IMS_A forwards BYE to UE_A
35B	—						User A is informed that call has ended

Step			Dir	ection	1		Message	Comment
	C	U	ı	М	Р	U		
	S	Ε	M	G	S	S		
	е	Α	S	С	Т	е		
	r		Α	F	N	r		
	Α					В		
36B			\rightarrow				200 OK	UE_A sends 200 OK for BYE
37B				\rightarrow			200 OK	IMS_A forwards 200 OK response to MGCF

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. 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.

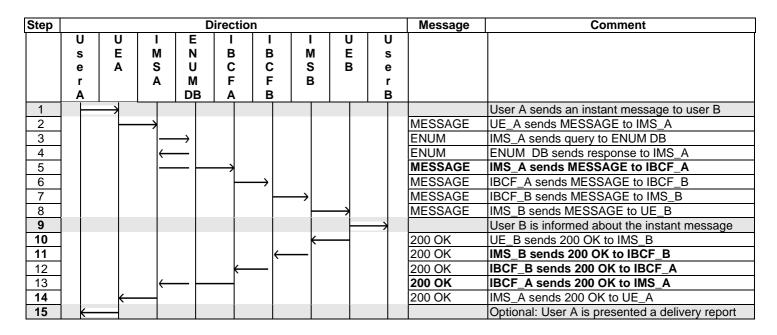
Note that the expected test sequence may only show the Call Flow that affects the test.

In the tabulations which follow, all references are to TS 124 229 [1].

4.5.1 General Capabilities

4.5.1.1 SIP messages longer than 1 500 bytes

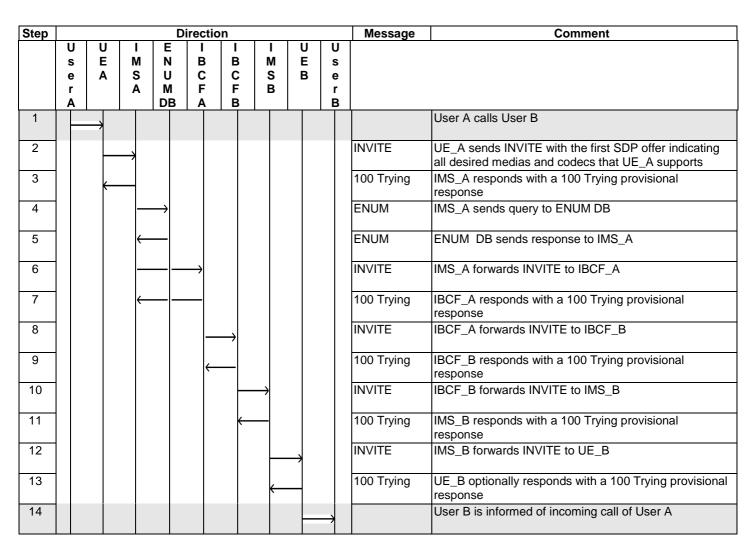
		Interoperability Test Descr	ription						
Identifier:	TD_IMS_MESS_0001								
Summary:	IMS network shall support SIP messages greater than 1 500 bytes								
Configuration:	CF_INT_CALL								
SUT:	IMS_B								
References:	Test Purpose Specification Reference								
	TP_IMS_4	1002_1	TS 124 229 [1], clause 4.2A ¶1						
Use Case ref.:	UC_05_I								
Pre-test conditions:	 HSS of IMS_A and of IMS B is configured according to table 1 UE_A and UE_B have IP bearers established to their respective IMS networks as per clause 4.2.1 UE_A and IMS_A configured to use TCP for transport UE_A is registered in IMS_A using any user identity UE_B is registered user of IMS_B using any user identity MESSAGE request and response has to be supported at II-NNI (TS 129 165 [16] see tables 6.1 and 6.3) 								
Test Sequence:	Step								
rest sequence.	1	Liser A sends message to Liser B	with at least 1 500 characters						
	2	Tool / Collab Incodage to Cool B With at loads 1 coo characters							
		Transfer deer Breceives messe	ago nom door / t						
Conformance	Check								
Criteria:	1	TP_IMS_4002_01 in CFW step 6	(MESSAGE)						
	-	ensure that {	(
when { UE_A sends a MESSAGE to UE_B									
		containing a Message_B	ody greater than 1 300 bytes }						
		then { IMS_B receives the MES.							
		containing the Message_ }	Body greater than 1 300 bytes }						



4.5.1.2 ENUM Query - Functionality test

Interoperability Test Description								
Identifier:	TD_IMS_ENUM_0001							
Summary:	ENUM query should result in return of NAF	PTR with correct SIP URI						
Configuration:	CF_INT_CALL							
SUT:	ENUM _A and ENUM_DB							
References:	Test Purpose	Specification Reference						
	TP_IMS_ENUM_01 TS 124 229 [1], clause 5.4.3.2 ¶11 (item 10 in 1 st numbered list)							
Use Case ref.:	UC_2_I							
Pre-test conditions:	 ENUM DB is configured with data for UE_B IMS_A (and B) are configured to support ENUM HSS of IMS_A and of IMS B is configured according to table 1 UE_A has IP bearer established to its respective IMS networks as per clause 4.2.1 UE_A is registered in IMS_A using any user identity 							
Test Sequence:	Step							
rest ocquence.	User A calls User B telURI Verify that user B is informed of	incoming call of User A						

	Interoperability Test Description						
Conformance	Check						
Criteria:	1	TP_IMS_ENUM_01 in CFW step 5 (NAPTR Response):					
		ensure that {					
		when { UE_A sends an initial INVITE for UE_B to IMS_A					
		containing a Request_URI					
		indicating a Tel_URI					
		and IMS_A sends a NAPTR_Query to ENUM_DB					
		containing the TN derived_from the Tel_URI_E.164_Number					
		}					
		then { ENUM_DB sends a NAPTR_Response to IMS_A					
		containing a NAPTR_Resource_Record					
		containing the TTL of the NAPTR_record					
		containing the service_type					
		indicating E2U+sip					
		containing the_regular_expression					
		indicating !^(.*)\$!					
		containing the SIP_URI of UE_B					
		indicating backreference (\1) for the user part					
		indicating domain name for the host part					
		containing SIP_URI_parameters 'if applicable' }					
		}}					



4.5.2 Registration and De-registration

4.5.2.1 First time registration in a visited IMS network

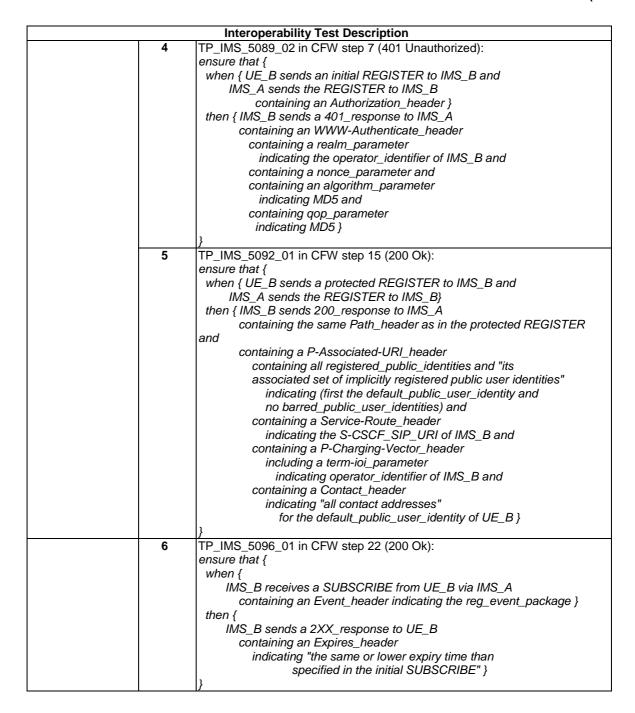
	Interoperability 1	Test Description								
Identifier:	TD_IMS_REG_0001_AKA									
Summary:	First time registration in a visited IMS network CF ROAM REG									
Configuration:	CF_ROAM_REG IMS_A and IMS_B									
SUT:	IMS_A and IMS_B Test Purpose Specification Reference									
References:	Test Purpose	Specification Reference								
	TP_IMS_5011_01	TS 124 229 [1], clauses 5.2.2.1 ¶16								
		(2 nd numbered list) and 5.2.2.2								
	TP_IMS_5011_02	TS 124 229 [1], clauses 5.2.2.1 ¶1 ¶16								
		(2 nd numbered list) and 5.2.2.2								
	TP_IMS_5044_01	TS 124 229 [1], clause 5.2.3 ¶2								
		(1 st numbered list)								
	TP_IMS_5089_01	TS 124 229 [1], clause 5.4.1.2.1A ¶1								
	TP_IMS_5092_01	TS 124 229 [1], clause 5.4.1.2.2F ¶1								
	TP_IMS_5096_01	TS 124 229 [1], clause 5.4.2.1.1 ¶1								
Use Case ref.:	UC_01_R									
D	1100 (1115 - 111 111									
Pre-test	 HSS of IMS_B is configured a 									
conditions:		to IMS_A as per clause 4.2.1								
	 UE_B not registered in IMS_I 									
	 IMS_A within the trust domain 									
	 UE_B is configured to use Al 	KA authentication								
Test Sequence:	Step									
	User B registers in IMS B using any valid user identity									
	2 Verify that UE_B show	s successful registration								
Conformance	Check									
Criteria:		FW step 4 (REGISTER):								
	ensure that {	, , , , DECIOTED , , 1MO A								
		when { UE_B sends an unprotected REGISTER to IMS_A								
		containing a Security-Client_header } then { IMS_A sends the REGISTER to IMS_B								
	containing a P									
		atit_fleader -CSCF_SIP_URI of IMS_A and								
	containing a Require_header containing a path_option_tag and									
	containing a path_option_tag and containing a P-Charging-Vector_header									
		n icid-value_parameter and								
	containing an icid-value_parameter and containing an orig-ioi_parameter and									
	not containing at term-ioi_parameter and									
		uthorization_header								
	I	n integrity-protected_parameter								
	indicating									
		a Security-Verify_header and								
		a Security-Client_header and								
		-Visited-Network-ID_header								
	indicating "th	ne visited network at the home network" }								
	[]									

	Interoperability Test Description
2	TP_IMS_5011_02 in CFW step 12 (REGISTER):
	ensure that {
	when { UE_B sends a protected REGISTER to IMS_A
	containing a Security-Client_header }
	then { IMS_A sends the REGISTER to IMS_B
	containing a Path_header
	containing P-CSCF_SIP_URI of IMS_A and
	containing a Require_header
	containing a path_option_tag and
	containing a P-Charging-Vector_header
	containing an icid-value_parameter and
	containing an orig-ioi_parameter
	indicating IMS_A and
	not containing a term-ioi_parameter and
	containing a Authorization_header
	containing an integrity-protected_parameter
	indicating yes
	not containing a Security-Verify _header and
	not containing a Security-Client_header and
	containing a P-Visited-Network-ID_header
	indicating "the visited network at the home network" }
3	TP_IMS_5044_01 in CFW step 19 (SUBSCRIBE):
	ensure that {
	when { IMS_A receives a 200_response from IMS_B }
	then { IMS_A sends a SUBSCRIBE to IMS_B
	containing a Request_URI
	indicating "the resource to which the P-CSCF wants
	to subscribe to" and
	containing a From_header
	indicating P-CSCF_SIP_URI of IMS_A and
	containing a To_header
	indicating the default_public_user_identity of UE_B and
	containing an Event_header
	indicating the reg_event_package and
	containing an Expires_header
	set to "a value greater than the one in the Expires_header
	of the 200_response" and
	containing a P-Asserted-Identity_header
	set to the P-CSCF_SIP_URI of IMS_A and
	containing a P-Charging-Vector_header
	containing an icid-value_parameter }
 	}
4	TP_IMS_5089_01 in CFW step 7 (401 Unauthorized):
	ensure that {
	when { UE_B sends an initial REGISTER to IMS_B and
	IMS_A sends the REGISTER to IMS_B
	containing an Authorization_header
	containing an integrity-protected_parameter indicating no }
	then { IMS_B sends a 401_response to IMS_A
	containing an WWW-Authenticate_header
	containing a realm_parameter
	indicating the operator_identifier of IMS_B and
	containing a nonce_parameter
	(containing a RAND_parameter and
	containing an AUTN_parameter) and
	containing an algorithm_parameter
	indicating AKAv1-MD5 and
	containing an ik_parameter and
	containing a ck_parameter }

Interoperability Test Description							
5	TP_IMS_5092_01 in CFW step 15 (200 Ok):						
	ensure that {						
	when { UE_B sends a protected REGISTER to IMS_B and						
	IMS_A sends the REGISTER to IMS_B}						
	then { IMS_B sends 200_response to IMS_A						
	containing the same Path_header as in the protected REGISTER						
	and						
	containing a P-Associated-URI header						
	containing all registered_public_identities and "its						
	associated set of implicitly registered public user identities"						
	indicating (first the default_public_user_identity and						
	no barred_public_user_identities) and						
	containing a Service-Route_header						
	indicating the S-CSCF_SIP_URI of IMS_B and						
	containing a P-Charging-Vector_header						
	including a term-ioi_parameter						
	indicating operator_identifier of IMS_B and						
	containing a Contact_header						
	indicating "all contact addresses"						
	for the default_public_user_identity of UE_B }						
	}						
6	TP_IMS_5096_01 in CFW step 22 (200 Ok):						
	ensure that {						
	when {						
	IMS_B receives a SUBSCRIBE from UE_B via IMS_A						
	containing an Event_header indicating the reg_event_package }						
	then {						
	IMS_B sends a 2XX_response to UE_B						
	containing an Expires_header						
	indicating "the same or lower expiry time than						
	specified in the initial SUBSCRIBE" }						
	}						
	U						

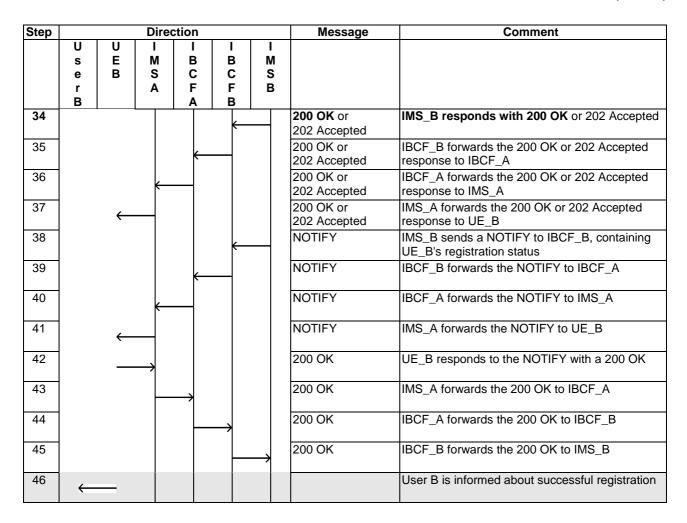
	Interoperability Test De	scription								
Identifier:	TD_IMS_REG_0001_MD5									
Summary:	First time registration in a visited IMS network									
Configuration:	CF_ROAM_REG									
SUT:	MS_A and IMS_B									
References:	Test Purpose	Specification Reference								
	TP_IMS_5011_03	TS 124 229 [1], clauses 5.2.2.1 ¶16 (2 nd numbered list) and 5.2.2.3								
	TP_IMS_5011_04	TS 124 229 [1], clauses 5.2.2.1 ¶16 (2 nd numbered list) and 5.2.2.3								
	TP_IMS_5044_01	TS 124 229 [1], clause 5.2.3 ¶2 (1 st numbered list)								
	TP_IMS_5089_02	TS 124 229 [1], clause 5.4.1.2.1B ¶1								
	TP_IMS_5092_01	TS 124 229 [1], clause 5.4.1.2.2F ¶1								
	TP_IMS_5096_01	TS 124 229 [1], clause 5.4.2.1.1 ¶1								
Use Case ref.:	UC_01_R									
Pre-test	HSS of IMS_B is configured according to table 1									
conditions:	 UE_B IP bearers established to IMS 									
	 UE_B not registered in IMS_B 	- '								
	IMS_A within the trust domain of IMS	S B								
	 UE_B is configured to use MD5 digest authentication 									
Test Sequence:	Step									
	User B registers in IMS B usin	g any valid user identity								
	essful registration									

Conformance	Check	Interoperability Test Description
Criteria:	1	TP_IMS_5011_03 in CFW step 4 (REGISTER):
		ensure that {
		when { UE_B sends an unprotected REGISTER to IMS_A }
		then { IMS_A sends the REGISTER to IMS_B
		containing a Path_header
		containing P-CSCF_SIP_URI of IMS_A and containing a Require_header
		containing a require_reduct
		containing a P-Charging-Vector_header
		(containing an icid-value_parameter and
		containing an orig-ioi_parameter and
		not containing a term-ioi_parameter) and
		containing a Authorization_header
		(not containing an integrity-protected_parameter or
		containing an integrity-protected_parameter indicating ip-assoc-pending) and
		containing a P-Visited-Network-ID_header
		indicating "the visited network at the home network" }
		}
	2	TP_IMS_5011_04 in CFW step 12 (REGISTER):
		ensure that {
		when { UE_B sends a protected REGISTER to IMS_A }
		then { IMS_A sends the REGISTER to IMS_B
		containing a Path_header containing P-CSCF_SIP_URI of IMS_A and
		containing r-odor_dir_ort or two_A and containing a Require_header
		containing a path_option_tag and
		containing a P-Charging-Vector_header
		(containing an icid-value_parameter and
		containing an orig-ioi_parameter
		indicating IMS_A and
		not containing a term-ioi_parameter) and
		containing a Authorization_header containing an integrity-protected_parameter
		indicating ip-assoc-yes and
		containing a P-Visited-Network-ID_header
		indicating "the visited network at the home network" }
		}
	3	TP_IMS_5044_01 in CFW step 19 (SUBSCRIBE):
		ensure that {
		when { IMS_A receives a 200_response from IMS_B
		then { IMS_A sends a SUBSCRIBE to IMS_B
		containing a Request_URI
		indicating "the resource to which the P-CSCF wants
		to subscribe to" and
		containing a From_header
		indicating P-CSCF_SIP_URI of IMS_A and
		containing a To_header indicating the default_public_user_identity of UE_B and
		containing an Event_header
		indicating the reg_event_package and
		containing an Expires_header
		set to "a value greater than the one in the Expires_header
		of the 200_response" and
		containing a P-Asserted-Identity_header
		containing an icid-value_parameter }



Step			Dire	ction			Message	Comment
	U s e r B	U E B	M S A	I B C F A	I B C F B	M S B		
1	_	\rightarrow						User B registers in IMS B
2			\rightarrow				REGISTER	UE_B sends a REGISTER to IMS_A
3				\longrightarrow			REGISTER	IMS_A forwards the REGISTER to IBCF_A
4					\longrightarrow		REGISTER	IBCF_A forwards the REGISTER to IBCF_B
5						\longrightarrow	REGISTER	IBCF_B forwards the REGISTER to IMS_B

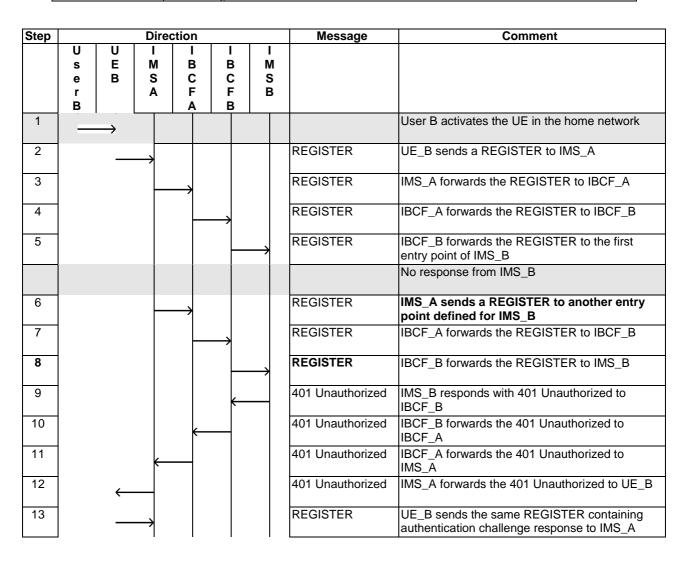
Step			Dire	ction			Message	Comment
	U s	U E	I M	I B	I B	I M		
	е	В	S	С	С	S		
	r B		Α	F A	F B	В		
6					←		401 Unauthorized	IMS_B responds with 401 Unauthorized to IBCF_B
7				\leftarrow			401 Unauthorized	IBCF_B forwards the 401 Unauthorized to IBCF_A
8			←				401 Unauthorized	IBCF_A forwards the 401 Unauthorized to IMS_A
9		\leftarrow					401 Unauthorized	IMS_A forwards the 401 Unauthorized to UE_B
10			\rightarrow				REGISTER	UE_B sends the same REGISTER containing authentication challenge response to IMS_A
11				\longrightarrow			REGISTER	IMS_A forwards the REGISTER to IBCF A
12					\longrightarrow		REGISTER	IBCF_A forwards the REGISTER to IBCF B
13						\longrightarrow	REGISTER	IBCF_B forwards the REGISTER to IMS B
14					←		200 OK	IMS_B responds with 200 OK
15							200 OK	IBCF_B forwards the 200 OK response to IBCF_A
16			\leftarrow				200 OK	IBCF_A forwards the 200 OK response to IMS_A
17		\leftarrow					200 OK	IMS_A forwards the 200 OK response to UE_B
18				\longrightarrow			SUBSCRIBE	IMS_A sends a SUBSCRIBE to IBCF_A
19					\rightarrow		SUBSCRIBE	IBCF_A forwards the SUBSCRIBE to IBCF_B
20						\rightarrow	SUBSCRIBE	IBCF_B forwards the SUBSCRIBE to IMS_B
21					\leftarrow		200 OK or 202 Accepted	IMS_B responds with a 200 OK or 202 Accepted
22				\leftarrow			200 OK or 202 Accepted	IBCF_B forwards 200 OK or 202 Accepted to IBCF_A
23			\leftarrow				200 OK or 202 Accepted	IBCF_A forwards 200 OK or 202 Accepted to IMS_A
24					\leftarrow		NOTIFY	IMS_B sends a NOTIFY to IBCF_B, containing UE_B's registration status
25				\leftarrow			NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
26			←				NOTIFY	IBCF_A forwards NOTIFY to IMS_A
27				\longrightarrow			200 OK	IMS_A responds to the NOTIFY with a 200 OK
28					\rightarrow		200 OK	IBCF_A forwards 200 OK response to IBCF_B
39						\rightarrow	200 OK	IBCF_B forwards 200 OK response to IMS_B
30			\rightarrow				SUBSCRIBE	UE_B sends a SUBSCRIBE (reg event package) to IMS_A
31				\longrightarrow			SUBSCRIBE	IMS_A forwards the SUBSCRIBE request to IBCF_A
32					\rightarrow		SUBSCRIBE	IBCF_A forwards the SUBSCRIBE request to IBCF_B
33						\longrightarrow	SUBSCRIBE	IBCF_B forwards the SUBSCRIBE request to IMS_B



4.5.2.2 No response from first entry point on REGISTER without topology hiding

	Interoperability Test Desc	cription								
Identifier:	TD_IMS_REG_0002									
Summary:	IMS network chooses a second entry point to the home network of a user that requested registration, if the first entry point does not answer, without topology hiding.									
Configuration:	CF_ROAM_REG									
SUT:	IMS_A									
References:	Test Purpose Specification Reference									
	TP_IMS_5203_01	TS 124 229 [1], clause 5.2.2.1 ¶33 (item 6 in 2 nd numbered list)								
	TP_IMS_5092_01	TS 124 229 [1], clause 5.4.1.2.2F ¶1								
Use Case ref.:	UC_01_R									
Pre-test conditions:	 HSS of IMS_B is configured according to table 1 UE_B IP bearers established to IMS_A as per clause 4.2.1 IMS_A configured with multiple entry points for IMS_B IMS_A not configured for topology hiding First entry point determined by the IMS_A pointing to a non-existing component in IMS_B 									
T 10										
Test Sequence:	Step 1 User B registers in IMS B using any user identity 2 Verify that UE_B shows successful registration									

		Interoperability Test Description
Conformance	Check	
Criteria:	1	TP_IMS_5203_01 in CFW step 7 (REGISTER): [I-CSCF] ensure that { when { IMS_A receives no response from IMS_B } then { IMS_A sends the REGISTER to another_entry_point of IMS_B } }
	2	TP_IMS_5092_01 in CFW step 18 (200 Ok): ensure that { when { UE_B sends a protected REGISTER to IMS_B and IMS_A sends the REGISTER to IMS_B} then { IMS_B sends 200_response to IMS_A

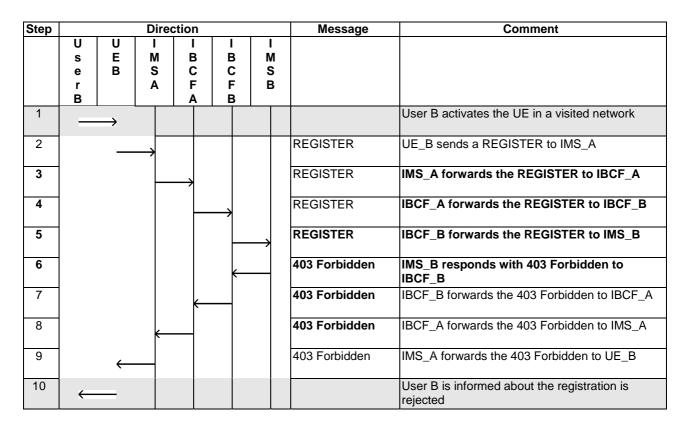


REGISTER IBCF_A forwards the REGISTER to IB		Comment	Message			irection	Di			Step
REGISTER IBCF_A forwards the REGISTER to IBC REGISTER IBCF_B forwards the REGISTER to IBC REGISTER IBCF_B forwards the REGISTER to IBC REGISTER IBCF_B forwards the REGISTER to IMS REGISTER IBCF_B forwards the 200 OK response IBCF_A forwards the SUBSCRIBE to IBCF SUBSCRIBE IBCF_B forwards the SUBSCRIBE to IBCF SUBSCRIBE IBCF_B forwards the SUBSCRIBE to IBCF IBCF_B forwards the SUBSCRIBE to IBCF IBCF_B forwards 200 OK or 202 Accepted Accepted 200 OK or 202 IBCF_B forwards 200 OK or 202 Accepted REGISTER IBCF_B forwards the 200 OK response IBCF_B forwards the 200 OK response IBCF_B forwards 200 OK or 202 Accepted REGISTER IBCF_B forwards 200 OK response IBCF_B forwards NOTIFY to IBCF_B IBCF_B forwards NOTIFY to IBCF_B IBCF_B forwards NOTIFY to IBCF_B IBCF_B forwards 200 OK response to IBCF_B forwards the SUBSCRIBE required and the subscribe req				I M	I	ı R	I N		_	
REGISTER					С				_	
REGISTER				В			Α		-	
REGISTER	FA	IMS_A forwards the REGISTER to IBCF A	REGISTER		<u>B</u>	——————————————————————————————————————			Б	14
17	CF B	IBCF_A forwards the REGISTER to IBCF E	REGISTER		\rightarrow					15
18	S B	IBCF_B forwards the REGISTER to IMS B	REGISTER	\longrightarrow					-	16
IBCF_A		IMS_B responds with 200 OK	200 OK		←				•	17
IMS_A 200 OK IMS_A forwards the 200 OK response SUBSCRIBE IMS_A sends a SUBSCRIBE to IBCF SUBSCRIBE IBCF_A forwards the SUBSCRIBE to I SUBSCRIBE IBCF_B forwards the SUBSCRIBE to I 200 OK or 202 Accepted Accepted Accepted BCF_A forwards 200 OK or 202 Accepted IMS_A NOTIFY IMS_B sends a NOTIFY to IMS_A, cor UE_B's registration status NOTIFY IBCF_B forwards NOTIFY to IBCF_A NOTIFY IBCF_A forwards NOTIFY to IBCF_A NOTIFY IBCF_A forwards NOTIFY to IMS_A 200 OK IBCF_A forwards 200 OK response to 200 OK IBCF_A forwards 200 OK response to 200 OK IBCF_A forwards 200 OK response to 200 OK IBCF_A forwards the SUBSCRIBE requible IBCF_B IMS_A SUBSCRIBE IBCF_A forwards the SUBSCRIBE requible IBCF_B IBCF_B forwards the SUBSCRIBE requible IBCF_B IBCF_B forwards the SUBSCRIBE requible IBCF_B forwards the SUBSCRIBE IBCF_B forward	to	IBCF_B forwards the 200 OK response to IBCF_A	200 OK			←				18
SUBSCRIBE IMS_A sends a SUBSCRIBE to IBCF SUBSCRIBE IBCF_A forwards the SUBSCRIBE to I SUBSCRIBE IBCF_B forwards 200 OK or 202 Accepted IBCF_B forwards 200 OK or 202 Accepted IMS_A NOTIFY IMS_B sends a NOTIFY to IMS_A, cor UE_B's registration status NOTIFY IBCF_B forwards NOTIFY to IMS_A SUBSCRIBE IBCF_A forwards NOTIFY to IMS_A SUBSCRIBE UE_B sends a SUBSCRIBE (reg evenipackage) to IMS_A SUBSCRIBE IMS_A forwards the SUBSCRIBE requible IMS_B SUBSCRIBE IBCF_B forwards the SUBSCRIBE requible IMS_B SUBSCRIBE IBCF_B forwards the SUBSCRIBE requible IMS_B SUBSCRIBE IBCF_B forwards the SUBSCRIBE requible IBCF_B forwards the SUBSCRIBE IBCF_B forwards the SUBSCRIB	se to	IBCF_A forwards the 200 OK response t	200 OK				•			19
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SUBSCRIBE IBCF_B forwards the SUBSCRIBE to I 200 OK or 202 IMS_B responds with a 200 OK or 202 Accepted Accepted Accepted IBCF_B forwards 200 OK or 202 Accepted IBCF_A forwards 200 OK or 202 Accepted IMS_A NOTIFY IMS_B sends a NOTIFY to IMS_A, cor UE_B's registration status NOTIFY IBCF_B forwards NOTIFY to IBCF_A NOTIFY IBCF_B forwards NOTIFY to IMS_A NOTIFY IBCF_B forwards NOTIFY to IMS_A NOTIFY IBCF_B forwards NOTIFY to IMS_A NOTIFY IBCF_B forwards NOTIFY to IMS_A NOTIFY IBCF_B forwards NOTIFY to IMS_A NOTIFY IBCF_B forwards NOTIFY with a 200 OK IBCF_B forwards 200 OK response to SUBSCRIBE UE_B sends a SUBSCRIBE (reg even) package) to IMS_A SUBSCRIBE IBCF_B forwards the SUBSCRIBE req IBCF_B SUBSCRIBE IBCF_B forwards the SUBSCRIBE req IBCF	_ A	IMS_A sends a SUBSCRIBE to IBCF_A	SUBSCRIBE				-			21
24 25 26 26 27 28 29 30 30 31 31 32 33 34 35 36 36 37 200 OK or 202 Accepted Accepted Accepted Accepted Accepted Accepted BCF_A Growards 200 OK or 202 Accepted IBCF_A Growards 200 OK or 202 Accepted IBCF_A Growards 200 OK or 202 Accepted IMS_A Growards and NOTIFY to IMS_A, corn UE_B's registration status NOTIFY IBCF_A Forwards NOTIFY to IBCF_A NOTIFY IBCF_A Forwards NOTIFY to IMS_A IBCF_A forwards NOTIFY to IMS_A IBCF_A forwards 200 OK response to IBCF_A forwards 200 OK IBCF_A IMS_A SUBSCRIBE IMS_A Growards the SUBSCRIBE requils IBCF_A forwards the SUBSCRIBE requils IBCF_B forwards the SUBSCRIBE requils	_	IBCF_A forwards the SUBSCRIBE to IBCF			\rightarrow					22
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Accepted IBCF_A 200 OK or 202 IBCF_A forwards 200 OK or 202 Accepted IMS_A NOTIFY IMS_B sends a NOTIFY to IMS_A, cor UE_B's registration status NOTIFY IBCF_B forwards NOTIFY to IBCF_A NOTIFY IBCF_A forwards NOTIFY to IBCF_A NOTIFY IBCF_A forwards NOTIFY to IMS_A 200 OK IMS_A responds to the NOTIFY with a 200 OK IBCF_B forwards 200 OK response to 200 OK IBCF_B forwards 200 OK response to 200 OK IBCF_B forwards 200 OK response to SUBSCRIBE UE_B sends a SUBSCRIBE (reg evenipackage) to IMS_A SUBSCRIBE IMS_A forwards the SUBSCRIBE requible IBCF_A forwards the SUBSCRIBE requible IBCF_B forwa			Accepted	-	←					
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NOTIFY IBCF_A forwards NOTIFY to IMS_A 200 OK IMS_A responds to the NOTIFY with a 200 OK IBCF_A forwards 200 OK response to 200 OK IBCF_B forwards 200 OK response to 200 OK IBCF_B forwards 200 OK response to SUBSCRIBE UE_B sends a SUBSCRIBE (reg event package) to IMS_A SUBSCRIBE IMS_A forwards the SUBSCRIBE requible IBCF_A SUBSCRIBE IBCF_B forwards the SUBSCRIBE requible IBCF_B SUBSCRIBE IBCF_B forwards the SUBSCRIBE requible IBCF_B SUBSCRIBE IBCF_B forwards the SUBSCRIBE requible IBCF_B forwards the SUBSCRIBE	taining	IMS_B sends a NOTIFY to IMS_A, contain UE_B's registration status		_	←					27
30 31 32 32 33 34 35 36 37 30 30 30 30 30 30 30 31 30 30 30 31 30 30 30 30 30 30 30 30 30 30 30 30 30		IBCF_B forwards NOTIFY to IBCF_A	NOTIFY			←				28
31 32 33 34 35 36 37 38 200 OK BCF_A forwards 200 OK response to 200 OK BCF_B forwards 200 OK response to 200 OK BCF_B forwards 200 OK response to 200 OK BCF_B forwards a SUBSCRIBE (reg event package) to IMS_A SUBSCRIBE BCF_A forwards the SUBSCRIBE requible BCF_B SUBSCRIBE BCF_B forwards the SUBSCRIBE requible BCF_B SUBSCRIBE BCF_B forwards the SUBSCRIBE requible BCF_B SUBSCRIBE BCF_B forwards the SUBSCRIBE requible BCF_B forwards the SUBSCRIBE requible BCF_B SUBSCRIBE BCF_B forwards the SUBSCRIBE requible BCF_B forwards the SUBSCRIBE requible BCF_B SUBSCRIBE BCF_B forwards the SUBSCRIBE requible BCF_B for		IBCF_A forwards NOTIFY to IMS_A	NOTIFY				•			29
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33 SUBSCRIBE UE_B sends a SUBSCRIBE (reg event package) to IMS_A SUBSCRIBE IMS_A forwards the SUBSCRIBE requible IBCF_A SUBSCRIBE IBCF_A forwards the SUBSCRIBE requible IBCF_B SUBSCRIBE IBCF_B forwards the SUBSCRIBE requible IMS_B 200 OK or IMS_B responds to the SUBSCRIBE with the subscribe impackage) to IMS_B responds to the SUBSCRIBE with the subscribe impackage) to IMS_B responds to the SUBSCRIBE with the subscribe impackage) to IMS_B responds to the SUBSCRIBE with the subscribe impackage) to IMS_B responds to the SUBSCRIBE with the subscribe impackage) to IMS_B responds to the SUBSCRIBE with the subscribe impackage) to IMS_B responds to the SUBSCRIBE with the subscribe impackage) to IMS_B responds to the SUBSCRIBE requible impackage) to IMS_B responds to IMS_B responds to the SUBSCRIBE with the subscribe impackage) to IMS_B responds to IMS_B responds to the SUBSCRIBE with the subscribe impackage) to IMS_B responds to IMS_B responds to the SUBSCRIBE with the subscribe impackage) to IMS_B responds to the SUBSCRIBE with the subscribe impackage) to IMS_B responds to IMS_B responds to the SUBSCRIBE with the subscribe impackage) to IMS_B responds to IMS_B responds to the SUBSCRIBE with the subscribe impackage) to IMS_B responds to	BCF_B	IBCF_A forwards 200 OK response to IBCF	200 OK		\rightarrow					31
package) to IMS_A SUBSCRIBE IMS_A forwards the SUBSCRIBE required IBCF_A SUBSCRIBE IBCF_A forwards the SUBSCRIBE required IBCF_B SUBSCRIBE IBCF_B forwards the SUBSCRIBE required IMS_B 200 OK or IMS_B responds to the SUBSCRIBE with the subscribe in the subsc	MS_B	IBCF_B forwards 200 OK response to IMS	200 OK	\longrightarrow						32
35 36 37 SUBSCRIBE IBCF_A forwards the SUBSCRIBE req IBCF_B SUBSCRIBE IBCF_B forwards the SUBSCRIBE req IMS_B 200 OK or IMS_B responds to the SUBSCRIBE w		UE_B sends a SUBSCRIBE (reg event package) to IMS_A	SUBSCRIBE				\rightarrow			33
36 SUBSCRIBE IBCF_B forwards the SUBSCRIBE req IMS_B 200 OK or IMS_B responds to the SUBSCRIBE w	est to	IMS_A forwards the SUBSCRIBE request t IBCF_A				──	-			34
IMS_B 200 OK or IMS_B responds to the SUBSCRIBE w					\rightarrow					35
		_		\longrightarrow						36
		IMS_B responds to the SUBSCRIBE with a OK or 202 Accepted	202 Accepted		(37
200 OK or BCF_B forwards the 200 OK or 202 Accepted response to IBCF_A	cepted	IBCF_B forwards the 200 OK or 202 Accepresponse to IBCF_A				-				38
200 OK or IBCF_A forwards the 200 OK or 202 Arresponse to IMS_A	cepted	IBCF_A forwards the 200 OK or 202 Accepresponse to IMS_A					•			39
	cepted	IMS_A forwards the 200 OK or 202 Accept	200 OK or					\leftarrow		40
	ntaining	IMS_B sends a NOTIFY to IBCF_B, contain		\blacksquare	(41

Step			Direc	ction			Message	Comment
	Омегв	U E B	I M S A	I B C F A	I B C F B	I M S B		
42				←			NOTIFY	IBCF_B forwards the NOTIFY to IBCF_A
43			←				NOTIFY	IBCF_A forwards the NOTIFY to IMS_A
44		\leftarrow					NOTIFY	IMS_A forwards the NOTIFY to UE_B
45			\rightarrow				200 OK	UE_B responds to the NOTIFY with a 200 OK
46				\longrightarrow			200 OK	IMS_A forwards the 200 OK to IBCF_A
47					\longrightarrow		200 OK	IBCF_A forwards the 200 OK to IBCF_B
48						\rightarrow	200 OK	IBCF_B forwards the 200 OK to IMS_B
49	←	_						User B is informed about successful registration

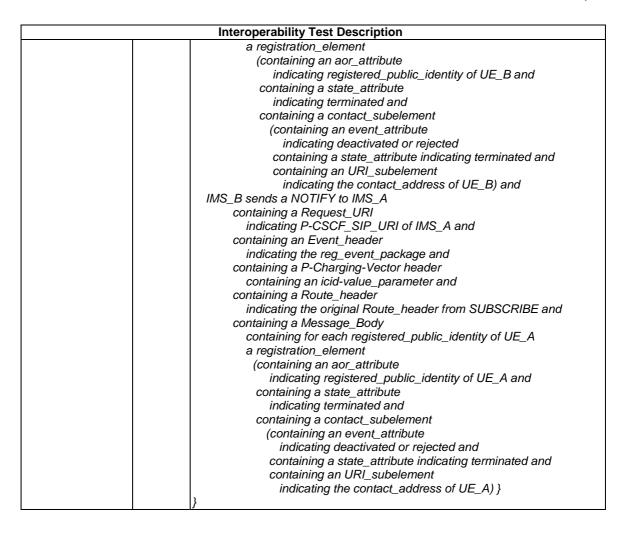
4.5.2.3 403 response to REGISTER from an un-trusted domain without topology hiding

		Interoperability Test Desc	cription						
Identifier:	TD_IMS_REG_0003								
Summary:	IMS network sends 403 response when attempting registration from a different trust domain without topology hiding								
Configuration:	CF_ROAM	//_REG							
SUT:	IMS_B								
References:	Test Purp		Specification Reference						
	TP_IMS_5		TS 124 229 [1], clause 5.3.1.2 ¶1						
Use Case ref.:	UC_01_R								
Pre-test conditions:	UE_BIMS_E	INC. D							
Test Sequence:	Step 1	User B registers in IMS B using	any user identity						
	2	Verify that UE_B shows unsucce							
Conformance	Check								
Criteria:	1	TP_IMS_5129_01 in CFW step ensure that { when { UE_B sends a valid init and IMS_B receives the R then { IMS_B sends a 403_res }	ial REGISTER to IMS_A EGISTER from IMS_A}						



4.5.2.4 Network initiated deregistration by the S-CSCF

		Interoperability Test Descr	ription						
Identifier:	TD_IMS_F	REG_0005							
Summary:	IMS netwo	ork can initiate user de-registration	, e.g., when a user runs out of credit						
Configuration:	CF_ROAM_REG								
SUT:	IMS_B								
References:	Test Purp	ose	Specification Reference						
	TP_IMS_5	5093_01	TS 124 229 [1], clause 5.4.1.5 ¶6						
			(1 st numbered list)						
Use Case ref.:	UC_01_R								
Pre-test	 HSS 	of IMS_B is configured according	to table 1						
conditions:	 UE_B 	IP bearers established to IMS_A	as per clause 4.2.1						
	 UE_B 	registered in IMS_B via IMS_A us	sing any user identity						
	 IMS_/ 	A within the trust domain of IMS_E	3						
Test Sequence:	Step								
	1	IMS_B is triggered manually to de	e-register user B						
	2	Verify that UE_B shows successf	ul de-registration						
Conformance	Check								
Criteria:	1	TP_IMS_5093_01 in CFW step 4	8 and 56						
		ensure that {							
		. =	rk_originated_deregistration_event }						
		then {							
		IMS_B sends a NOTIFY to IMS	-						
		containing a Request_UR	2/						
		indicating UE_B and	,						
		containing an Event_head							
		indicating the reg_ever	=1 0						
		containing a P-Charging-							
		containing an icid-value							
		containing a Route_head							
			Route_header from SUBSCRIBE and						
		containing a Message_Bo	oay istered_public_identity of UE_B						
		Containing for each reg	istered_public_identity or oc_d						

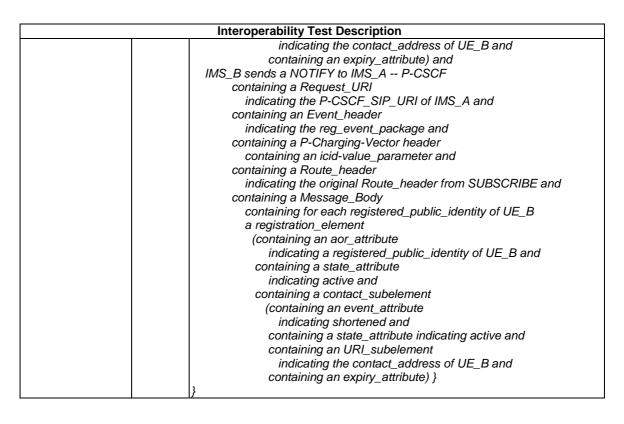


Step			Dire	ction			Message	Comment
	s C	UEB	- М	ВС	I B	I M S		
	e r	В	S	F	C	B		
	В			A	В			
								IMS_B is triggered to de-register user B
47					←		NOTIFY	IMS_B sends a NOTIFY to IMS_A, containing UE_B's de-registration
48				\leftarrow			NOTIFY	IBCF_B forwards the NOTIFY to IBCF_A
49			\leftarrow				NOTIFY	IBCF_A forwards the NOTIFY to IMS_A
50		\leftarrow					NOTIFY	IMS_A sends a NOTIFY to UE_B, containing UE_B's de-registration
51			\rightarrow				200 OK	UE_B responds to the NOTIFY with a 200 OK
52				\longrightarrow			200 OK	IMS_A forwards the 200 OK response to IBCF_A
53					\rightarrow		200 OK	IBCF_A forwards the 200 OK response to IBCF_B
54						\rightarrow	200 OK	IBCF_B forwards the 200 OK to IMS_B
55					←		NOTIFY	IMS_B sends a NOTIFY to IMS_A, containing IMS_A's de-registration
56				←			NOTIFY	IBCF_B forwards the NOTIFY to IBCF_A

Step			Direc	ction			Message	Comment
	U s e r B	U E B	I M S A	I B C F A	I B C F B	M S B		
57			(NOTIFY	IBCF_A forwards the NOTIFY to IMS_A
58				\rightarrow			200 OK	IMS_A responds to the NOTIFY with a 200 OK
59					\longrightarrow		200 OK	IBCF_A forwards the 200 OK response to IBCF_B
60						\rightarrow	200 OK	IBCF_B forwards the 200 OK to IMS_B
61	\leftarrow							User B is informed about de-registration

4.5.2.5 Network initiated re-authentication by the S-CSCF

	Interoperability Test Description									
Identifier:	TD_IMS_REG_0006									
Summary:	IMS network can initiate user re-authentication									
Configuration:	CF_ROAM_REG									
SUT:	IMS_B									
References:	Test Purpose Specification Reference									
	TP_IMS_5094_01 TS 124 229 [1], clause 5.4.1.6 ¶2									
Use Case ref.:	UC_01_R	L 4/								
Pre-test conditions:	 HSS of IMS_B is configured according to table 1 UE_B IP bearers established to IMS_A as per clause 4.2.1 UE_B registered in IMS_B using any user identity IMS_A within the trust domain of IMS_B Event received in S-CSCF of IMS_B to re-authenticate UE_B 									
Test Sequence:	Step									
rest sequence.	1 IMS_B network is triggered to re-authentic	cata usor B								
	2 Verify that UE_B shows successful registi									
	2 Verily that OE_B shows successful registi	alion								
Conformance	Check									
Criteria:	1 TP_IMS_5094_01 in CFW steps 48 and 5	56								
	ensure that { when { IMS_B receives a network_origing then { IMS_B sends a NOTIFY to UE_B containing a Request_URI indicating UE_B and containing an Event_header indicating the reg_event_packade containing a P-Charging-Vector header indicating an icid-value_parame containing a Route_header indicating the original Route_header indicating a Message_Body containing a Message_Body containing for each registered_indicating a registered_indicating an aor_attribute indicating a registered_public containing a state_attribute indicating active and containing a contact_subelement (containing an event_attribute indicating shortened and containing a state_attribute indicating a state_attribute indicating a state_attribute indicating a state_attribute indicating shortened and containing a state_attribute indicating a state_attrib	ge and eader eter and eader from SUBSCRIBE and public_identity of UE_B elic_identity of UE_B and enent								



Step			Direc	ction			Message	Comment
	U s e r B	U E B	I M S A	I B C F A	I B C F B	M S B		
								IMS_B is triggered to re-authenticate user B
47					←		NOTIFY	IMS_B sends a NOTIFY to IMS_A, containing UE_B's re-authentication
48				←			NOTIFY	IBCF_B forwards the NOTIFY to IBCF_A
49			\leftarrow				NOTIFY	IBCF_A forwards the NOTIFY to IMS_A
50		\leftarrow					NOTIFY	IMS_B sends a NOTIFY to UE_B, containing UE_ re-authentication
51		_	\rightarrow				200 OK	UE_B responds to the NOTIFY with a 200 OK
52				\rightarrow			200 OK	IMS_A forwards the 200 OK to IBCF_A
53					\rightarrow		200 OK	IBCF_A forwards the 200 OK response to IBCF_B

Step			Dir	ection			Message	Comment
	U s	U E	I M	l B	I B	I M		
	e	В	S	С	С	S		
	r B		Α	F	F B	В		
54		ļ			Ė	$\stackrel{\vdash}{\longrightarrow}$	200 OK	IBCF_B forwards the 200 OK response to IMS_B
55					\leftarrow		NOTIFY	IMS_B sends a NOTIFY to IMS_A, containing IMS_A's re-authentication
56				-			NOTIFY	IBCF_B forwards the NOTIFY to IBCF_A
57			+				NOTIFY	IBCF_A forwards the NOTIFY to IMS_A
58			-	\longrightarrow			200 OK	IMS_A responds to the NOTIFY with a 200 OK
59					\rightarrow		200 OK	IBCF_A forwards the 200 OK response to IBCF_B
60					-	\rightarrow	200 OK	IBCF_B forwards the 200 OK response to IMS_B
61			\rightarrow				REGISTER	UE_B sends the same REGISTER containing authentication challenge response to IMS_A
62			-	\longrightarrow			REGISTER	IMS_A forwards the REGISTER to IBCF A
63					\rightarrow		REGISTER	IBCF_A forwards the REGISTER to IBCF B
64						\rightarrow	REGISTER	IBCF_B forwards the REGISTER to IMS B
65					←		200 OK	IMS_B responds with 200 OK
66				(200 OK	IBCF_B forwards the 200 OK response to IBCF_A
67			+				200 OK	IBCF_A forwards the 200 OK response to IMS_A
68		\leftarrow					200 OK	IMS_A forwards the 200 OK response to UE_B
69				\longrightarrow			SUBSCRIBE	IMS_A sends a SUBSCRIBE to IBCF_A
70					\rightarrow		SUBSCRIBE	IBCF_A forwards the SUBSCRIBE to IBCF_B
71						\rightarrow	SUBSCRIBE	IBCF_B forwards the SUBSCRIBE to IMS_B
72					—		200 OK or 202 Accepted	IMS_B responds with a 200 OK or 202 Accepted
73				K	\blacksquare		200 OK or 202 Accepted	IBCF_B forwards 200 OK or 202 Accepted to IBCF_A
74			+				200 OK or 202 Accepted	IBCF_A forwards 200 OK or 202 Accepted to IMS_A
75					—		NOTIFY	IMS_B sends a NOTIFY to IMS_A, containing UE_B's registration status
76				←	-		NOTIFY	IBCF_B forwards NOTIFY to IBCF_A
77			+				NOTIFY	IBCF_A forwards NOTIFY to IMS_A
78			-	\longrightarrow			200 OK	IMS_A responds to the NOTIFY with a 200 OK
79					\rightarrow		200 OK	IBCF_A forwards 200 OK response to IBCF_B
80						\rightarrow	200 OK	IBCF_B forwards 200 OK response to IMS_B
81			\rightarrow				SUBSCRIBE	UE_B sends a SUBSCRIBE (reg event package) to IMS_A

Step			Direc	ction			Message	Comment
	U s e r B	U E B	I M S A	I B C F A	I B C F B	M S B		
82				—			SUBSCRIBE	IMS_A forwards the SUBSCRIBE request to IBCF_A
83					\rightarrow		SUBSCRIBE	IBCF_A forwards the SUBSCRIBE request to IBCF_B
84						\rightarrow	SUBSCRIBE	IBCF_B forwards the SUBSCRIBE request to IMS_B
85					←		200 OK or 202 Accepted	IMS_B responds to the SUBSCRIBE with a 200 OK or 202 Accepted
86				←			200 OK or 202 Accepted	IBCF_B forwards the 200 OK or 202 Accepted response to IBCF_A
87			←				200 OK or 202 Accepted	IBCF_A forwards the 200 OK or 202 Accepted response to IMS_A
88		\leftarrow					200 OK or 202 Accepted	IMS_A forwards the 200 OK or 202 Accepted response to UE_B
89					←		NOTIFY	IMS_B sends a NOTIFY to IBCF_B, containing UE_B's registration status
90				←			NOTIFY	IBCF_B forwards the NOTIFY to IBCF_A
91			←				NOTIFY	IBCF_A forwards the NOTIFY to IMS_A
92		\leftarrow					NOTIFY	IMS_A forwards the NOTIFY to UE_B
93			\rightarrow				200 OK	UE_B responds to the NOTIFY with a 200 OK
94				\rightarrow			200 OK	IMS_A forwards the 200 OK to IBCF_A
95					\rightarrow		200 OK	IBCF_A forwards the 200 OK to IBCF_B
96						\longrightarrow	200 OK	IBCF_B forwards the 200 OK to IMS_B
97			←					User B is informed about successful registration

4.5.3 Initial Dialog or Subsequent Procedures

4.5.3.1 Initial INVITE Dialog Procedures

4.5.3.1.1 Initial INVITE Request Procedures - Originating

4.5.3.1.1.1 Default SIP URI with DNS/ENUM lookup procedure

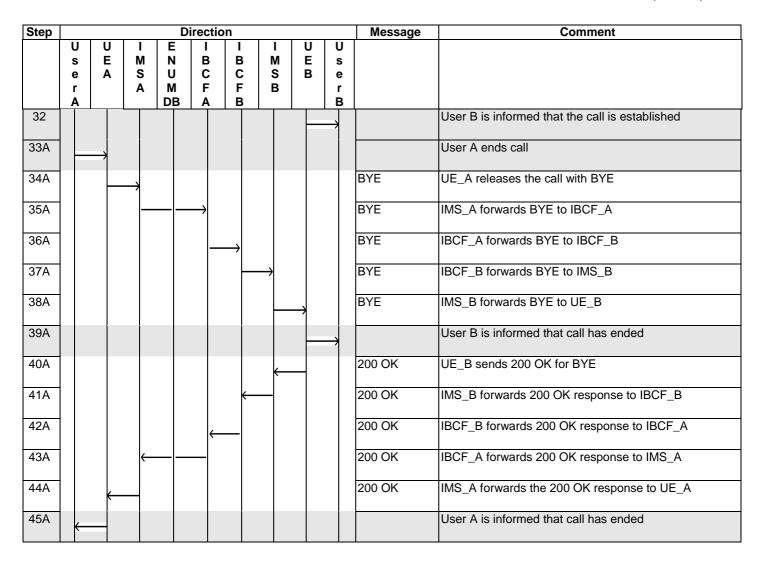
Identifier: TD_IMS_CALL_0001		Interoperability Te	st Description									
MIS network can handle establishment of dialogs for users with default SIP URIs and resolve Tel URI E.164 numbers Configuration: CF_INT_CALL	Identifier:											
Test Sequence: CF_INT_CALL												
CF INT_CALL IMS_A and IMS_B	Cummary:											
MS_A and IMS_B Test Purpose Specification Reference TP_IMS_5097_01 TS 124 229 [1], clause 5.4.3.2 ¶11 (1st numbered list) TP_IMS_5097_02 TS 124 229 [1], clause 5.4.3.2 ¶11 (item 9 in 1st numbered list) TP_IMS_5097_04 TS 124 229 [1], clause 5.4.3.2 ¶11 (item 9 in 1st numbered list) TP_IMS_5097_04 TS 124 229 [1], clause 5.4.3.2 ¶11 (item 10 in 1st numbered list) TP_IMS_5107_02 TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 1st numbered list) TP_IMS_5107_01 TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 8st numbered list) TP_IMS_5115_01 TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4st numbered list) TP_IMS_5115_02 TS 124 229 [1], clause 5.4.3.3 ¶92 (item 2 in 4st numbered list) TP_IMS_5115_04 TS 124 229 [1], clause 5.4.3.3 ¶92 (item 2 in 4st numbered list) TP_IMS_5115_04 TS 124 229 [1], clause 5.4.3.3 ¶92 (item 2 in 4st numbered list) TP_IMS_5131_01 TS 124 229 [1], clause 5.4.3.3 ¶92 (item 2 in 4st numbered list) TP_IMS_5131_02 TS 124 229 [1], clause 5.4.3.3 ¶92 (item 2 in 4st numbered list) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TS 12	Configuration:											
Test Purpose												
TP_IMS_5097_01 TS 124 229 [1], clause 5.4.3.2 ¶11 (1st numbered list) TP_IMS_5097_02 TS 124 229 [1], clause 5.4.3.2 ¶11 (item 9 in 1st numbered list) TP_IMS_5097_04 TS 124 229 [1], clause 5.4.3.2 ¶11 (item 9 in 1st numbered list) TP_IMS_5107_02 TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 8t numbered list) TP_IMS_5107_01 TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 8t numbered list) TP_IMS_5115_01 TS 124 229 [1], clause 5.4.3.3 ¶19 (item 1 in 8t numbered list) TP_IMS_5115_03 TS 124 229 [1], clause 5.4.3.3 ¶19 (item 2 in 4t numbered list) TP_IMS_5115_02 TS 124 229 [1], clause 5.4.3.3 ¶19 (item 2 in 4t numbered list) TP_IMS_5115_04 TS 124 229 [1], clause 5.4.3.3 ¶19 (item 2 in 4t numbered list) TP_IMS_5131_01 TS 124 229 [1], clause 5.4.3.3 ¶20 (item 2 in 4t numbered list) TP_IMS_5131_01 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) UC_02_1 * HSS of IMS_A and of IMS B is configured according to table 1 * UE_A is registered in IMS_A as userSIP_priv according to table 1 * UE_A is registered in IMS_B as userSIP_priv according to table 1 * UE_A is registered in IMS_B as userSIP_priv according to table 1 * UE_A is registered in IMS_B as userSIP_priv according to table 1 * UE_A is registered in IMS_B as userSIP_priv according to table 1 * UE_A is registered in IMS_B as userSIP_priv according to table 1 * UE_A is registered in IMS_B as userSIP_priv according to table 1 * UE_A is registered in IMS_B as userSIP_priv according to table 1 * UE_A is registered in IMS_B as userSIP_priv according to table 1 * UE_A is registered in IMS_B as userSIP_priv according to table 1 * UE_A is registered in IMS_B as userSIP_priv according to table 1 * UE_A is registered in IMS_B as userSIP_priv according to table 1 * UE_A is registered in IMS_B as userSIP_priv according to table 1 * UE_A is registered in IMS_B as userSIP_priv according to table 1 * UE_A is registered in IMS_B as userSIP_priv according to table 1 * UE_A is re												
(1st numbered list) TP_IMS_5097_02 TS 124 229 [1], clause 5.4.3.2 ¶11 (item 9 in 1st numbered list) TP_IMS_5097_04 TS 124 229 [1], clause 5.4.3.2 ¶11 (item 9 in 1st numbered list) TP_IMS_5097_04 TS 124 229 [1], clause 5.4.3.2 ¶11 (item 10 in 1st numbered list) TP_IMS_5107_02 TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 8th numbered list) TP_IMS_5107_01 TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 8th numbered list) TP_IMS_5115_01 TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4th numbered list) TP_IMS_5115_03 TS 124 229 [1], clause 5.4.3.3 ¶92 (item 3 in 4th numbered list) TP_IMS_5115_02 TS 124 229 [1], clause 5.4.3.3 ¶92 (item 3 in 4th numbered list) TP_IMS_5115_04 TS 124 229 [1], clause 5.4.3.3 ¶92 (item 2 in 4th numbered list) TP_IMS_5131_04 TS 124 229 [1], clause 5.4.3.3 ¶92 (item 2 in 4th numbered list) TP_IMS_5131_04 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.4.3.3 ¶92 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.4.3.3 ¶92 (after	ittererences.											
TP_IMS_5097_02		11 _1M6_5037_01	(1 st numbered list)									
(item 9 in 1 st numbered list) TP_IMS_5097_04 TS 124 229 [1], clause 5.4.3.2 ¶11 (item 10 in 1st numbered list) TP_IMS_5107_02 TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 8 numbered list) TP_IMS_5107_01 TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 8 numbered list) TP_IMS_5115_01 TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4 numbered list) TP_IMS_5115_03 TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4 numbered list) TP_IMS_5115_02 TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4 numbered list) TP_IMS_5115_02 TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4 numbered list) TP_IMS_5115_04 TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4 numbered list) TP_IMS_5131_01 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) UC_02_ UC_02_ UC_02_ UC_02_ UE_A and UE_B have IP bearers established to their respective IMS networks as per clause 4.2.1 UE_A is registered in IMS_B as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 UE_A within the trust domain of IMS_B Common DNS is configured with an ENUM entry for the Tel URI E.164 Number of userSIP of IMS_B Verify that user B is informed of incoming call of User A Verify that user B is informed of incoming call of User A Verify that user A is informed of incoming call of User A User B answers the call		TP IMS 5007 02	TS 124 220 [1] clause 5.4.3.2 ¶11									
TP_IMS_5097_04 TS 124 229 [1], clause 5.4.3.2 ¶11 (item 10 in 1st numbered list)		11 _1WO_0007_02	(item 9 in 1 st numbered list)									
(item 10 in 1st numbered list)		TP IMS 5097 04	TS 124 229 [1] clause 5 4 3 2 ¶11									
TP_IMS_5107_02 TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 8 th numbered list) TP_IMS_5107_01 TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 8 th numbered list) TP_IMS_5115_01 TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4 th numbered list) TP_IMS_5115_03 TS 124 229 [1], clause 5.4.3.3 ¶92 (item 3 in 4 th numbered list) TP_IMS_5115_02 TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4 th numbered list) TP_IMS_5115_04 TS 124 229 [1], clause 5.4.3.3 ¶92 (item 2 in 4 th numbered list) TP_IMS_5131_00 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) UC_02_I Pre-test conditions: • HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per clause 4.2.1 • UE_A is registered in IMS_A as userSIP_priv according to table 1 • UE_B is registered in IMS_B as userSIP_priv according to table 1 • UE_B is registered in IMS_B as userSIP_priv according to table 1 • UE_B is registered in IMS_B as userSIP_priv according to table 1 • UE_B is registered in IMS_B as userSIP_priv according to table 1 • UE_B is registered in IMS_B as userSIP_priv according to table 1 • UE_B is registered in IMS_B as userSIP_priv according to table 1 • UE_B is registered in IMS_B as userSIP_priv according to table 1 • UE_B is registered in IMS_B • Common DNS is configured with an ENUM entry for the Tel URI E.164 Number of userSIP of IMS_B Test Sequence: Step 1 User A calls user B's Tel_URI (i.e. userSIP in IMS_B) 2 Verify that user A is informed of incoming call of User A 3 Verify that user A is informed of incoming call of User A 4 User B answers the call		11 _1MG_5057_64	(item 10 in 1 st numbered list)									
(item 1 in 8 th numbered list) TP_IMS_5107_01 TS 124 229 [1], clause 5.4.3.2 ¶119 (item 2 in 4 th numbered list) TP_IMS_5115_01 TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4 th numbered list) TP_IMS_5115_03 TS 124 229 [1], clause 5.4.3.3 ¶92 (item 3 in 4 th numbered list) TP_IMS_5115_02 TS 124 229 [1], clause 5.4.3.3 ¶92 (item 2 in 4 th numbered list) TP_IMS_5115_04 TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4 th numbered list) TP_IMS_5131_01 TS 124 229 [1], clause 5.4.3.3 ¶92 (item 2 in 4 th numbered list) TP_IMS_5131_01 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) UC_02_I Pre-test conditions: • HSS of IMS_A and of IMS B is configured according to table 1 • UE_A and UE_B have IP bearers established to their respective IMS networks as per clause 4.2.1 • UE_A is registered in IMS_A as userSIP_priv according to table 1 • UE_B is registered in IMS_B as userSIP_priv according to table 1 • UE_A is registered in IMS_B as userSIP_priv according to table 1 • UE_B is registered in IMS_B as userSIP_priv according to table 1 • UE_B is registered in IMS_B as userSIP_priv according to table 1 • UE_B is registered in IMS_B as userSIP_priv according to table 1 • UE_B is registered in IMS_B as userSIP_priv according to table 1 • UE_B is registered in IMS_B as userSIP_priv according to table 1 • UE_B is registered in IMS_B as userSIP_priv according to table 1 • UE_B is registered in IMS_B as userSIP_priv according to table 1 • UE_B is registered in IMS_B as userSIP_priv according to table 1 • UE_B is registered in IMS_B as userSIP_priv according to table 1 • UE_B is registered in IMS_B is informed that UE_B is ringing 4 User B answers the call		TP IMS 5107 02	TS 124 229 [1] clause 5.4.3.2 ¶119									
TP_IMS_5107_01 TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 8 th numbered list) TP_IMS_5115_01 TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4 th numbered list) TP_IMS_5115_03 TS 124 229 [1], clause 5.4.3.3 ¶92 (item 3 in 4 th numbered list) TP_IMS_5115_02 TS 124 229 [1], clause 5.4.3.3 ¶92 (item 2 in 4 th numbered list) TP_IMS_5115_04 TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4 th numbered list) TP_IMS_5131_01 TS 124 229 [1], clause 5.4.3.3 ¶92 (item 2 in 4 th numbered list) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) UC_02_I UC_02_I UC_02_I UC_02_I USe Case ref.: UC_A and UE_B have IP bearers established to their respective IMS networks as per clause 4.2.1 UE_A is registered in IMS_A as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 UE_B is registered in IMS_B Common DNS is configured with an ENUM entry for the Tel URI E.164 Number of userSIP of IMS_B Verify that user B is informed of incoming call of User A Verify that user B is informed that UE_B is ringing 4 User B answers the call		11 _1MO_0107_02	(item 1 in 8 th numbered list)									
(item 1 in 8 th numbered list) TP_IMS_5115_01 TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4 th numbered list) TP_IMS_5115_03 TS 124 229 [1], clause 5.4.3.3 ¶92 (item 3 in 4 th numbered list) TP_IMS_5115_02 TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4 th numbered list) TP_IMS_5115_04 TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4 th numbered list) TP_IMS_5131_01 TS 124 229 [1], clause 5.4.3.3 ¶92 (item 2 in 4 th numbered list) TP_IMS_5131_01 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) UC_02_I UC_02_I UE_A and UE_B have IP bearers established to their respective IMS networks as per clause 4.2.1 UE_A is registered in IMS_A as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 UE_A is registered in IMS_B as userSIP_priv according to table 1 UE_A is registered in IMS_B as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 UE_B is registered in IMS_B is informed of IMS_B Common DNS is configured with an ENUM entry for the Tel URI E.164 Number of userSIP of IMS_B Test Sequence: Step 1 User A calls user B's Tel_URI (i.e. userSIP in IMS_B) 2 Verify that user B is informed of incoming call of User A 3 Verify that user B is informed of incoming call of User A 4 User B answers the call		TP IMS 5107 01	TS 124 229 [1] clause 5 4 3 2 ¶119									
TP_IMS_5115_01 TP_IMS_5115_03 TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4 th numbered list) TP_IMS_5115_03 TS 124 229 [1], clause 5.4.3.3 ¶92 (item 3 in 4 th numbered list) TP_IMS_5115_02 TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4 th numbered list) TP_IMS_5115_04 TS 124 229 [1], clause 5.4.3.3 ¶92 (item 2 in 4 th numbered list) TP_IMS_5131_01 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) UC_02_I Pre-test Conditions: Pre-test UC_02_I HSS of IMS_A and of IMS B is configured according to table 1 UE_A is registered in IMS_B as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 UE_B is registered with an ENUM entry for the Tel URI E.164 Number of userSIP of IMS_B Common DNS is configured with an ENUM entry for the Tel URI E.164 Number of userSIP of IMS_B Verify that user B is informed of incoming call of User A 3 Verify that user B is informed of incoming call of User A 3 Verify that user B is informed that UE_B is ringing		11 _1M6_6107_61	(item 1 in 8 th numbered list)									
Citem 2 in 4 th numbered list) TP_IMS_5115_03		TP IMS 5115 01	TS 124 229 [1] clause 5 4 3 3 ¶91									
TP_IMS_5115_03 TS 124 229 [1], clause 5.4.3.3 ¶92 (item 3 in 4 th numbered list) TP_IMS_5115_02 TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4 th numbered list) TP_IMS_5115_04 TS 124 229 [1], clause 5.4.3.3 ¶92 (item 2 in 4 th numbered list) TP_IMS_5131_01 TP_IMS_5131_01 TS 124 229 [1], clause 5.4.3.3 ¶92 (item 2 in 4 th numbered list) TP_IMS_5131_01 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) UC_02_I Pre-test conditions: HSS of IMS_A and of IMS B is configured according to table 1 UE_A and UE_B have IP bearers established to their respective IMS networks as per clause 4.2.1 UE_A is registered in IMS_A as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 UE_MS_A within the trust domain of IMS_B Common DNS is configured with an ENUM entry for the Tel URI E.164 Number of userSIP of IMS_B Test Sequence: Step 1 User A calls user B's Tel_URI (i.e. userSIP in IMS_B) 2 Verify that user B is informed of incoming call of User A 3 Verify that user A is informed that UE_B is ringing 4 User B answers the call		11 _1M6_6116_61	(item 2 in 4 th numbered list)									
(item 3 in 4 th numbered list) TP_IMS_5115_02 TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4 th numbered list) TP_IMS_5115_04 TS 124 229 [1], clause 5.4.3.3 ¶92 (item 2 in 4 th numbered list) TP_IMS_5131_01 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) UC_02_I Pre-test conditions: HSS of IMS_A and of IMS B is configured according to table 1 UE_A and UE_B have IP bearers established to their respective IMS networks as per clause 4.2.1 UE_A is registered in IMS_A as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 IMS_A within the trust domain of IMS_B Common DNS is configured with an ENUM entry for the Tel URI E.164 Number of userSIP of IMS_B Test Sequence: Step 1		TP IMS 5115 03	TS 124 229 [1] clause 5 4 3 3 ¶92									
(item 2 in 4 th numbered list) TP_IMS_5115_04		11 _1M6_6116_66	(item 3 in 4 th numbered list)									
(item 2 in 4 th numbered list) TP_IMS_5115_04		TP IMS 5115 02	TS 124 229 [1] clause 5 4 3 3 ¶91									
TP_IMS_5115_04 TP_IMS_5131_01 TP_IMS_5131_01 TP_IMS_5131_02 TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) UC_02_I Pre-test conditions: HSS of IMS_A and of IMS B is configured according to table 1 UE_A and UE_B have IP bearers established to their respective IMS networks as per clause 4.2.1 UE_A is registered in IMS_A as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 IMS_A within the trust domain of IMS_B Common DNS is configured with an ENUM entry for the Tel URI E.164 Number of userSIP of IMS_B Test Sequence: Step 1 User A calls user B's Tel_URI (i.e. userSIP in IMS_B) 2 Verify that user B is informed of incoming call of User A 3 Verify that user A is informed that UE_B is ringing 4 User B answers the call			(item 2 in 4 th numbered list)									
(item 2 in 4 th numbered list) TP_IMS_5131_01 TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) UC_02_I Pre-test conditions: HSS of IMS_A and of IMS B is configured according to table 1 UE_A and UE_B have IP bearers established to their respective IMS networks as per clause 4.2.1 UE_A is registered in IMS_A as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 IMS_A within the trust domain of IMS_B Common DNS is configured with an ENUM entry for the Tel URI E.164 Number of userSIP of IMS_B Test Sequence: Step 1		TP IMS 5115 04	TS 124 229 [1], clause 5.4.3.3 ¶92									
TP_IMS_5131_01			(item 2 in 4 th numbered list)									
(after note 11) TP_IMS_5131_02		TP IMS 5131 01	TS 124 229 [1], clause 5.3,2.1 ¶62									
TP_IMS_5131_02 TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11) UC_02_I Pre-test conditions: HSS of IMS_A and of IMS B is configured according to table 1 UE_A and UE_B have IP bearers established to their respective IMS networks as per clause 4.2.1 UE_A is registered in IMS_A as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 IMS_A within the trust domain of IMS_B Common DNS is configured with an ENUM entry for the Tel URI E.164 Number of userSIP of IMS_B Test Sequence: Step 1			(after note 11)									
UC_02_I Pre-test conditions: - HSS of IMS_A and of IMS B is configured according to table 1 - UE_A and UE_B have IP bearers established to their respective IMS networks as per clause 4.2.1 - UE_A is registered in IMS_A as userSIP_priv according to table 1 - UE_B is registered in IMS_B as userSIP_priv according to table 1 - IMS_A within the trust domain of IMS_B - Common DNS is configured with an ENUM entry for the Tel URI E.164 Number of userSIP of IMS_B Test Sequence: - Step - 1		TP_IMS_5131_02										
Pre-test conditions: HSS of IMS_A and of IMS B is configured according to table 1 UE_A and UE_B have IP bearers established to their respective IMS networks as per clause 4.2.1 UE_A is registered in IMS_A as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 IMS_A within the trust domain of IMS_B Common DNS is configured with an ENUM entry for the Tel URI E.164 Number of userSIP of IMS_B Test Sequence: Step 1 User A calls user B's Tel_URI (i.e. userSIP in IMS_B) 2 Verify that user B is informed of incoming call of User A 3 Verify that user A is informed that UE_B is ringing 4 User B answers the call												
UE_A and UE_B have IP bearers established to their respective IMS networks as per clause 4.2.1 UE_A is registered in IMS_A as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 IMS_A within the trust domain of IMS_B Common DNS is configured with an ENUM entry for the Tel URI E.164 Number of userSIP of IMS_B Test Sequence: Step	Use Case ref.:	UC_02_I										
UE_A and UE_B have IP bearers established to their respective IMS networks as per clause 4.2.1 UE_A is registered in IMS_A as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 IMS_A within the trust domain of IMS_B Common DNS is configured with an ENUM entry for the Tel URI E.164 Number of userSIP of IMS_B Test Sequence: Step												
UE_A and UE_B have IP bearers established to their respective IMS networks as per clause 4.2.1 UE_A is registered in IMS_A as userSIP_priv according to table 1 UE_B is registered in IMS_B as userSIP_priv according to table 1 IMS_A within the trust domain of IMS_B Common DNS is configured with an ENUM entry for the Tel URI E.164 Number of userSIP of IMS_B Test Sequence: Step 1	Pre-test	HSS of IMS_A and of IMS B is	configured according to table 1									
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UE_B is registered in IMS_B as userSIP_priv according to table 1 IMS_A within the trust domain of IMS_B Common DNS is configured with an ENUM entry for the Tel URI E.164 Number of userSIP of IMS_B Test Sequence: Step 1		per clause 4.2.1	·									
IMS_A within the trust domain of IMS_B Common DNS is configured with an ENUM entry for the Tel URI E.164 Number of userSIP of IMS_B Test Sequence: Step 1 User A calls user B's Tel_URI (i.e. userSIP in IMS_B) 2 Verify that user B is informed of incoming call of User A 3 Verify that user A is informed that UE_B is ringing 4 User B answers the call		 UE_A is registered in IMS_A as 	s userSIP_priv according to table 1									
Common DNS is configured with an ENUM entry for the Tel URI E.164 Number of userSIP of IMS_B Test Sequence: Step User A calls user B's Tel_URI (i.e. userSIP in IMS_B) Verify that user B is informed of incoming call of User A Verify that user A is informed that UE_B is ringing User B answers the call		 UE_B is registered in IMS_B as 	s userSIP_priv according to table 1									
Test Sequence: Step		 IMS_A within the trust domain 	of IMS_B									
Test Sequence: Step												
1 User A calls user B's Tel_URI (i.e. userSIP in IMS_B) 2 Verify that user B is informed of incoming call of User A 3 Verify that user A is informed that UE_B is ringing 4 User B answers the call		userSIP of IMS_B	·									
1 User A calls user B's Tel_URI (i.e. userSIP in IMS_B) 2 Verify that user B is informed of incoming call of User A 3 Verify that user A is informed that UE_B is ringing 4 User B answers the call												
2 Verify that user B is informed of incoming call of User A 3 Verify that user A is informed that UE_B is ringing 4 User B answers the call	Test Sequence:											
2 Verify that user B is informed of incoming call of User A 3 Verify that user A is informed that UE_B is ringing 4 User B answers the call		1 User A calls user B's Tel	_URI (i.e. userSIP in IMS_B)									
4 User B answers the call		2 Verify that user B is infor	med of incoming call of User A									
		3 Verify that user A is infor	med that UE_B is ringing									
5 Verify that user A is informed that call has been answered												
J Verify that user A is informed that call has been answered		5 Verify that user A is infor	med that call has been answered									
6 Verify that user B is informed that the call is established												
7 User A ends the call		7 User A ends the call										
8 Verify that user B is informed that call has ended			med that call has ended									
9 Verify that user A is informed that call has ended												

		Interoperability Test Description
Conformance	Check	
Criteria:	1	TP_IMS_5097_01 in CFW step 8 (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 and
		not containing a P- access-network-info header}
	2	TP_IMS_5097_02 in CFW step 8 (INVITE):
		ensure that {
		when { UE_A sends an initial INVITE to UE_B
		then { IMS_B receives the initial INVITE
		containing a P-Asserted-Identity_header
		indicating the SIP_URI of UE_A
		and
		containing a P-Asserted-Identity_header
		indicating the Tel_URI of UE_A }
		}
	3	TP_IMS_5097_04 in CFW step 8 (INVITE):
		ensure that {
		when { UE_A sends an initial INVITE to UE_B
		containing a Request_URI
		indicating a Tel_URI}
		then { IMS_A sends a NAPTR_Query to ENUM_DBDB
		containing the Tel_URI_E.164_Number }
		when { IMS_A receives NAPTR_Response from ENUM_DB
		containing a NAPTR_Resource_Record
		indicating the SIP_URI of UE_B }
		then { IMS_A sends the initial INVITE to IMS_B
		containing a Request_URI
		indicating the SIP_URI of UE_B
		containing a P-Charging-Vector_header
		not containing an access-network-charging-info_parameter
		}
	4	TP_IMS_5107_02 in CFW step 29 (ACK):
		ensure that {
		when { UE_A sends ACK to UE_B }
		then { IMS_B receives the ACK
		not containing Route_header
		indicating the S-CSCF_SIP_URI of IMS_A }
		}
	5	TP_IMS_5107_01 in CFW step 36A (BYE):
		ensure that {
		when { UE_A sends BYE to UE_B }
		then { IMS_B receives the BYE
		not containing Route_header
		indicating the S-CSCF_SIP_URI of IMS_A }
		}

	Interoperability Test Description
6	TP_IMS_5115_01 in CFW step 15 (180 Ringing):
"	ensure that {
	when { UE_B sends a 180_response to UE_A }
	then { IMS_A receives the 180_response from IMS_B
	containing a P-Charging-Vector_header
	containing an orig-ioi_parameter
	indicating operator_identifier of IMS_A and
	containing a term-ioi_parameter
	indicating operator_identifier of IMS_B
7	TP_IMS_5115_03 in CFW step 16 (180 Ringing):
'	ensure that {
	when { UE_B sends a 1xx_response to UE_A
	the of CIMO. A manifest the days managed from IMO. D
	then { IMS_A receives the 1xx_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 }
	<u>}</u>
8	TP_IMS_5115_02 in CFW step 21 (2xx):
	ensure that {
	when { UE_B sends a 2xx_response to UE_A }
	then { IMS_A receives the 2xx_response from IMS_B
	containing a P-Charging-Vector_header
	containing an orig-ioi_parameter
	indicating operator_identifier of IMS_A and
	containing a term-ioi_parameter
	indicating operator_identifier of IMS_B
	}
9	TP_IMS_5115_04 in CFW step 23 (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}
	}
10	TP_IMS_5131_01 in CFW step 16 (180 Ringing):
	ensure that {
	when { UE_B sends a 180_response to UE_A }
	then { IMS_B sends the 180_response to IMS_A
	not containing a P-Charging-Function-Addresses_header }
	}
11	TP_IMS_5131_02 in CFW step 23 (2xx)
''	ensure that {
	when { UE_B sends a 2xx_response to UE_A }
	then { IMS_A receives the 2xx_response from IMS_B
	not containing a P-Charging-Function-Addresses_header }
	}

Step	Direction									Message	Comment
	U s e r A	U E A	M S A	E N U M DB	I B C F A	I B C F B	I M S B	UEB	U s e r B		
1		\rightarrow									User A calls User B
2			\rightarrow							INVITE	UE_A sends INVITE with the first SDP offer indicating all desired medias and codecs that UE_A supports
3		—	\blacksquare							100 Trying	IMS_A responds with a 100 Trying provisional response

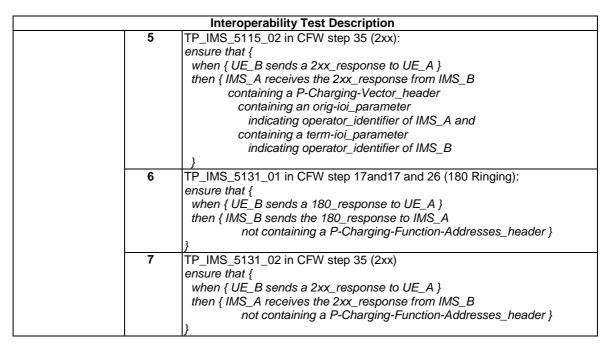
Step				Dire	ction					Message	Comment
	U	_	I E		I 3 E	I	l M	U E	U		
	s e	Α	M N S U	J		C	M S	В	s e		
	r A		A N			F B	В		r B		
4			\longrightarrow						Ī	ENUM	IMS_A sends query to ENUM DB
5			\leftarrow							ENUM	ENUM DB sends response to IMS_A
6					,					INVITE	IMS_A forwards INVITE to IBCF_A
7			\leftarrow							100 Trying	IBCF_A responds with a 100 Trying provisional response
8						,				INVITE	IBCF_A forwards INVITE to IBCF_B
9					\leftarrow	_				100 Trying	IBCF_B responds with a 100 Trying provisional response
10							>			INVITE	IBCF_B forwards INVITE to IMS_B
11							-			100 Trying	IMS_B responds with a 100 Trying provisional response
12)		INVITE	IMS_B forwards INVITE to UE_B
13									\rightarrow		User B is informed of incoming call of User A
14							←			180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting
15										180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
16					\leftarrow	-				180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
17										180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
18										180 Ringing	IMS_A forwards the 180 Ringing response to UE_A
19	—										User A is informed that UE_B is ringing
20								←	4		User B answers call
21								-		200 OK	UE_B responds INVITE with 200 OK to indicate that the call has been answered
22										200 OK	IMS_B forwards 200 OK response to IBCF_B
23					←—	_				200 OK	IBCF_B forwards 200 OK response to IBCF_A
24										200 OK	IBCF_A forwards 200 OK response to IMS_A
25										200 OK	IMS_A forwards 200 OK response to UE_A
26	—										User A is informed that call has been answered
27			>							ACK	UE_A acknowledges the receipt of 200 OK for INVITE
28				\longrightarrow	,					ACK	IMS_A forwards ACK to IBCF_A
29					;	,				ACK	IBCF_A forwards ACK to IBCF_B
30						-	>			ACK	IBCF_B forwards ACK to IMS_B
31								\rightarrow		ACK	IMS_B forwards ACK to UE_B
		I	I	1			l	l			

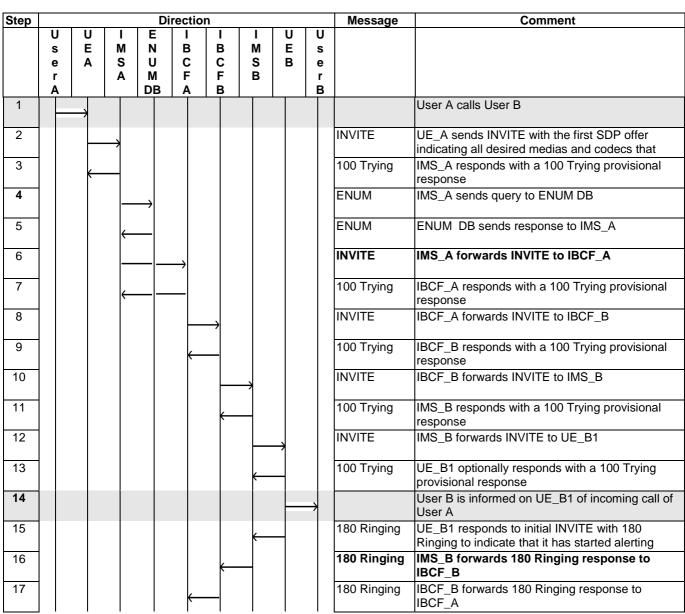


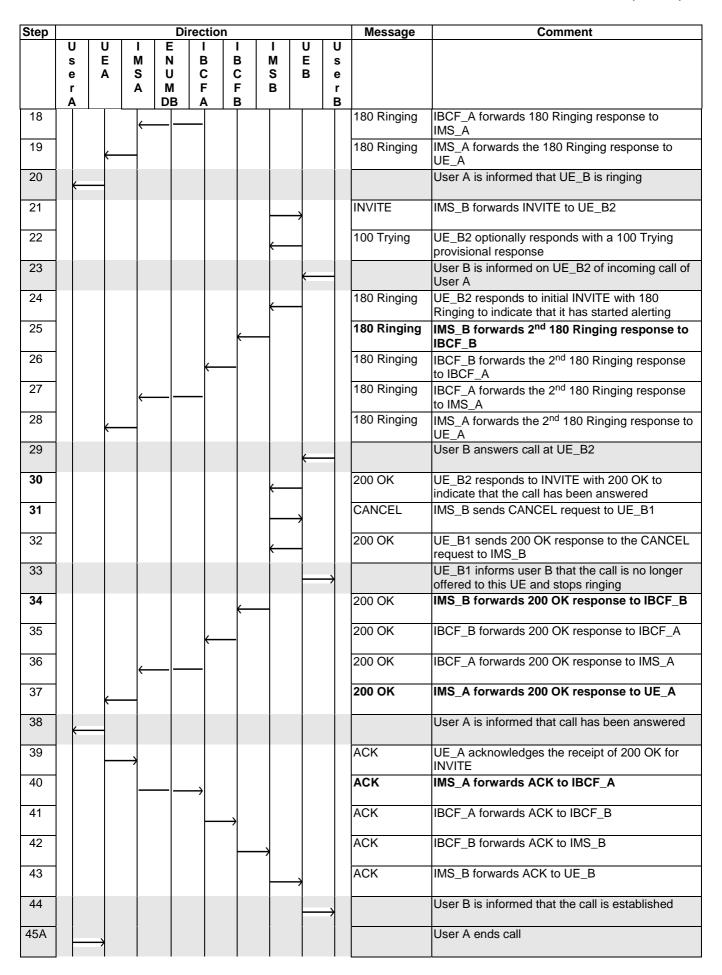
4.5.3.1.1.2 Default SIP URI

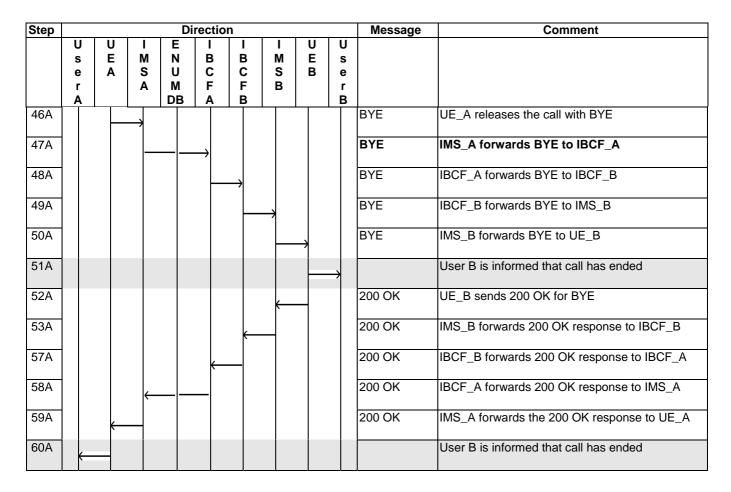
	Interoperability	Test Description								
ldentifier:	TD_IMS_CALL_0001F									
Summary:	IMS network can handle establishment of a call when the call is being offered to									
Configuration:	multiple terminals CF INT CALL									
SUT:	IMS A and IMS B									
References:	Test Purpose	Specification Reference								
	TP_IMS_5097_01	TS 124 229 [1], clause 5.4.3.2 ¶11 (1 st numbered list)								
	TP_IMS_5107_02	TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 8 th numbered list)								
	TP_IMS_5107_01	TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 8 th numbered list)								
	TP_IMS_5115_01	TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4 th numbered list)								
	TP_IMS_5115_02	TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4 th numbered list)								
	TP_IMS_5131_01	TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11)								
	TP_IMS_5131_02	TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11)								
Use Case ref.:	UC_12									

		Interoperability Test Description						
Pre-test	• HSS	of IMS_A and of IMS B is configured according to table 1						
conditions:	 UE_A and UE_B have IP bearers established to their respective IMS networks as 							
	_	per clause 4.2.1						
		A is registered in IMS_A as userSIP_priv according to table 1						
		B is registered in IMS_B via UE_B1 and UE_B2 as userSIP according to						
	table							
		A within the trust domain of IMS_B						
	11110_	y within the tract demain of the_B						
Test Sequence:	Step							
	1	User A calls User B						
	2	Verify that user B is informed of incoming call of User A on UE_B1						
	3	Verify that user B is informed of incoming call of User A on UE_B2						
	4	Verify that user A is informed that a UE of User B is ringing						
	5	User B answers call on UE_B2						
	6	Verify that user B is informed at UE_B1 that the call is no longer offered						
	7	Verify that user A is informed that call has been answered						
	8	Verify that user B is informed that the call is established						
	9	User A ends the call						
	10	Verify that user B is informed that call has ended						
	11	Verify that user A is informed that call has ended						
Conformance	Check							
Criteria:	1	TP_IMS_5097_01 in CFW step 8 (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 and						
		not containing a P- access-network-info header}						
		Thot containing a 1 - access-network-into neadery						
	2	TP_IMS_5107_02 in CFW step 41 (ACK):						
		ensure that {						
		when { UE_A sends ACK to UE_B }						
		then { IMS_B receives the ACK						
		not containing Route_header						
		indicating the S-CSCF_SIP_URI of IMS_A }						
		}						
	3	TP_IMS_5107_01 in CFW step 48A (BYE):						
		ensure that {						
		when { UE_A sends BYE to UE_B }						
		then { IMS_B receives the BYE						
		not containing Route_header						
		indicating the S-CSCF_SIP_URI of IMS_A }						
		TD IMO 5445 04 in OFM stee 47 and 00 (400 Bin signs)						
	4	TP_IMS_5115_01 in CFW step 17 and 26 (180 Ringing):						
		ensure that { when { UE_B sends a 180_response to UE_A }						
		then { IMS_A receives the 180_response from IMS_B						
		containing a P-Charging-Vector_header						
		containing a r-Charging-vector_neader containing an orig-ioi_parameter						
		indicating operator_identifier of IMS_A and						
		containing a term-ioi_parameter						
		indicating operator_identifier of IMS_B						
I]						









4.5.3.1.1.3 Default Tel URI

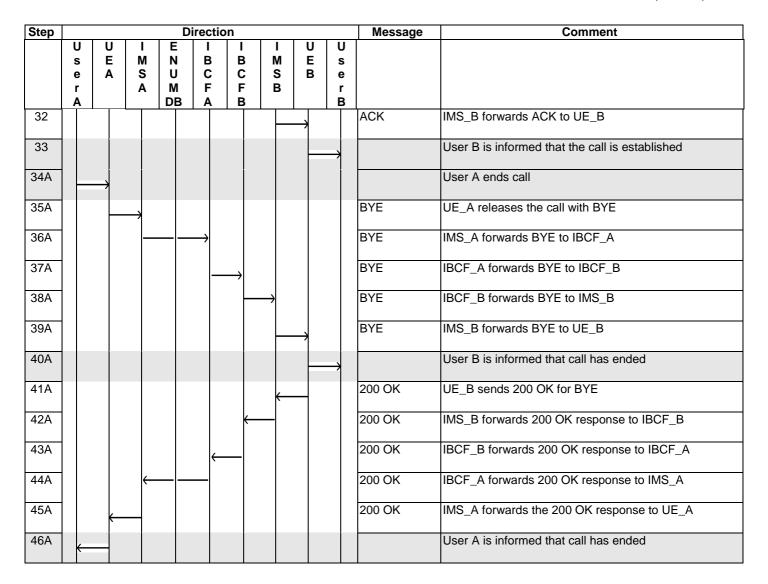
	Interoperability	Test Description								
Identifier:	TD_IMS_CALL_0002	•								
Summary:	IMS network can handle establis	IMS network can handle establishment of dialogs for users with default TEL URIs								
Configuration:	CF_INT_CALL									
SUT:	IMS_A and IMS_B									
References:	Test Purpose	Specification Reference								
	TP_IMS_5097_01	TS 124 229 [1], clause 5.4.3.2 ¶11 (1 st numbered list)								
	TP_IMS_5097_02	TS 124 229 [1], clause 5.4.3.2 ¶11 (item 9 1 st numbered list)								
	TP_IMS_5107_02	TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 8 th numbered list)								
	TP_IMS_5107_01	TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 8 th numbered list)								
	TP_IMS_5115_01	TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4 th numbered list)								
	TP_IMS_5115_03	TS 124 229 [1], clause 5.4.3.3 ¶92 (item 2 in 4 th numbered list)								
	TP_IMS_5115_02	TS 124 229 [1], clause 5.4.3.3 ¶91 (item 2 in 4 th numbered list)								
	TP_IMS_5115_04	TS 124 229 [1], clause 5.4.3.3 ¶92 (item 2 in 4 th numbered list)								
	TP_IMS_5131_01	TS 124 229 [1], clause 5.4.3.3 ¶62 (after note 11)								
	TP_IMS_5131_02	TS 124 229 [1], clause 5.3.2.1 ¶62 (after note 11)								
Use Case ref.:	UC_02_I	,								

		Interoperability Test Description								
Pre-test	• HSS	of IMS_A and of IMS B is configured according to table 1								
conditions:		A and UE_B have IP bearers established to their respective IMS networks as								
		ause 4.2.1								
		_A is registered in IMS_A using userTEL_priv according to table 1								
		_B is registered in IMS_B using userTEL_priv according to table 1								
	IMS_A within the trust domain of IMS_B									
	ve_	A Within the truct definant of this_b								
Test Sequence:	Step									
-	1	User A calls user B (i.e. userTEL in IMS_B)								
	2	Verify that user B is informed of incoming call of User A								
	3	Verify that user A is informed that UE_B is ringing								
	4	User B answers the call								
	5	Verify that user A is informed that call has been answered								
	6	Verify that user B is informed that the call is established								
	7	User A ends the call								
	8	Verify that user B is informed that call has ended								
	9	Verify that user A is informed that call has ended								
Conforme	Ch!									
Conformance Criteria:	Check	TD IMC 5007 04 in CDM stop 9 (INIVITE):								
Gillella.	1	TP_IMS_5097_01 in CFW step 8 (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 and								
		not containing a P- access-network-info header }								
	2	TP_IMS_5097_02 in CFW step 8 (INVITE)								
		ensure that {								
		when { UE_A sends an initial INVITE to UE_B								
		}								
		then { IMS_B receives the initial INVITE								
		containing a P-Asserted-Identity_header								
		indicating the SIP_URI of UE_A								
		and containing a P-Asserted-Identity_header								
		indicating the Tel_URI of UE_A}								
	3	TP_IMS_5107_02 in CFW step 30 (ACK):								
		ensure that {								
		when { UE_A sends ACK to UE_B }								
		then { IMS_B receives the ACK								
		not containing Route_header								
		indicating the S-CSCF_SIP_URI of IMS_A }								
	A	TD_IMC_5407_04 in CDM stop 27A (DV5):								
	4	TP_IMS_5107_01 in CFW step 37A (BYE):								
		ensure that { when { UE_A sends BYE to UE_B }								
		then { IMS_B receives the BYE								
		not containing Route_header								
		indicating the S-CSCF_SIP_URI of IMS_A }								
	<u> </u>	יע								

TP_IMS_5115_01 in CFW step 17 (180 Ringing): ensure that { when { UNE A sends a 180_response to UE_A } then { IMS_A receives the 180_response from IMS_B containing a P-Charging-Vector_header containing an orig-ioi_parameter indicating operator_identifier of IMS_A and containing a letm-ioi_parameter indicating operator_identifier of IMS_B TP_IMS_5115_03 in CFW step 17 (180 Ringing): ensure that { when { UE_B sends a 1xx_response to UE_A } } then { IMS_A receives the 1xx_response containing a P-Asserted-Identity_header indicating the SIP_URI of UE_B and containing a P-Asserted-Identity_header indicating the Te_URI of UE_B and containing a P-Asserted-Identity_header indicating the Te_URI of UE_B } TP_IMS_5115_02 in CFW step 24 (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 a perator_identifier of IMS_A and containing a remi-ioi_parameter indicating operator_identifier of IMS_B } TP_IMS_5115_04 in CFW step 24 (2xx): ensure that { when { UE_B sends a 2xx_response to UE_A } then { IMS_A receives the 2xx_response to UE_A } then { IMS_A receives the 2xx_response to UE_A } } **TP_IMS_5115_04 in CFW step 24 (2xx): ensure that { when { UE_B sends a 2xx_response to UE_A } } **TP_IMS_5131_01 in CFW step 17 (180 Ringing): ensure that { when { UE_B sends a 180_response to UE_A } then { IMS_B sends a 180_response to IMS_A		Interoperability Test Description
ensure that { when { UE B sends a 180_response to UE A } then { IMS_A receives the 180_response from IMS_B containing a P-Charging-Vector_header containing an orig-ioi_parameter indicating operator_identifier of IMS_A and containing a term-ioi_parameter indicating operator_identifier of IMS_B 6 TP_IMS_5115_03 in CFW step 17 (180 Ringing): ensure that { when { UE_B sends a 1xx_response to UE_A } } then { IMS_A receives the 1xx_response containing a P-Assented-Identity_header indicating the SIP_URI of UE_B and containing a P-Assented-Identity_header indicating the FIP_URI of UE_B and containing a P-Assented-Identity_header indicating the Tel_URI of UE_B and containing a P-Assented-Identity_header indicating that { when { UE_B sends a 2xx_response to UE_A } then { IMS_A receives the 2xx_response from IMS_B containing a P-Charging-Vector_header containing an orig-ioi_parameter indicating operator_identifier of IMS_A and containing a term-ioi_parameter indicating operator_identifier of IMS_B 8 TP_IMS_5115_04 in CFW step 24 (2xx): ensure that { when { UE_B sends a 2xx_response to UE_A } then { IMS_A receives the 2xx_response containing a P-Assented-Identity_header indicating the SIP_URI of UE_B and containing a P-Assented-Identity_header indicating the FIP_URI of UE_B and containing a P-Assented-Identity_header indicating the FIP_URI of UE_B } 9 TP_IMS_5131_01 in CFW step 17 (180 Ringing): ensure that { when { UE_B sends a 180_response to UE_A } then { IMS_B sends the 180_response to UE_A } then { IMS_B sends a 180_response to UE_A } then { IMS_B sends the 180_response to UE_A } then { IMS_B sends a 180_response to UE_A } then { IMS_B sends a 180_response to UE_A } then { IMS_B sends a 180_response to UE_A } then { IMS_B sends a 180_response to UE_A } then { IMS_B sends a 180_response to UE_A } then { IMS_B sends a 180_response to UE_A } then { IMS_B sends a 180_r	5	
when { UE_B sends a 180_response to UE_A} then { IMS_A receives the 180_response from IMS_B containing a P-Charging-Vector_header containing an orgi-oi_parameter indicating operator_identifier of IMS_A and containing a term-ioi_parameter indicating operator_identifier of IMS_B 6 TP_IMS_5115_03 in CFW step 17 (180 Ringing): ensure that { when { UE_B sends a 1xx_response to UE_A } } then { IMS_A receives the 1xx_response 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 } 7 TP_IMS_5115_02 in CFW step 24 (2xx): ensure that { when { UE_B sends a 2xx_response to UE_A } then { IMS_A receives the 2xx_response from IMS_B containing a P-Charging-Vector_header containing an orig-ioi_parameter indicating operator_identifier of IMS_A and containing a term-ioi_parameter indicating operator_identifier of IMS_B 8 TP_IMS_5115_04 in CFW step 24 (2xx): ensure that { when { UE_B sends a 2xx_response to UE_A } } then { IMS_A receives the 2xx_response containing a P-Asserted-Identity_header indicating the SIP_URI of UE_B and containing a P-Asserted-Identity_header indicating the FIP_URI of UE_B and containing a P-Asserted-Identity_header indicating the FIP_URI of UE_B and containing a P-Asserted-Identity_header indicating the FIP_URI of UE_B and containing a P-Asserted-Identity_header indicating the FIP_URI of UE_B and containing a P-Asserted-Identity_header indicating the FIP_URI of UE_B and containing a P-Asserted-Identity_header indicating the FIP_URI of UE_B and containing a P-Charging-Function-Addresses_header } } 9 TP_IMS_5131_01 in CFW step 24 (2xx) ensure that { when { UE_B sends a 180_response to UE_A } then { IMS_B sends the 180_response to UE_A } then { IMS_B receives the 2xx_response from IMS_B ensure that { when { UE_B sends a 2xx_response from IMS_B ensure that { when { UE_B sends a 2xx_response from IMS_B ensure that { when { UE_B sends a 2xx_response from IMS_B ensure that { when { UE_B sends a 2xx_respo		. , , , , , , , , , , , , , , , , , , ,
then { IMS_A receives the 180_response from IMS_B containing a P-Charging-Vector_header containing an orig-ioi_parameter indicating operator_identifier of IMS_A and containing a term-ioi_parameter indicating operator_identifier of IMS_B 6		
containing a P-Charging-Vector_header containing a norig-loi_parameter indicating operator_identifier of IMS_A and containing a term-loi_parameter indicating operator_identifier of IMS_B 6		
containing an orig-ioi, parameter indicating operator, identifier of IMS_A and containing a term-ioi, parameter indicating operator, identifier of IMS_B 6		
indicating operator_identifier of IMS_A and containing a term-ioi_parameter indicating operator_identifier of IMS_B 6		
containing a term-ioi_parameter indicating operator_identifier of IMS_B TP_IMS_5115_03 in CFW step 17 (180 Ringing): ensure that { when { UE_B sends a 1xx_response to UE_A } } then { IMS_A receives the 1xx_response 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 } TP_IMS_5115_02 in CFW step 24 (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 a noi-joi_parameter indicating operator_identifier of IMS_A and containing a term-ioi_parameter indicating operator_identifier of IMS_B TP_IMS_5115_04 in CFW step 24 (2xx): ensure that { when { UE_B sends a 2xx_response to UE_A } } then { IMS_A receives the 2xx_response to UE_A } } then { IMS_A receives the 2xx_response 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 } TP_IMS_5131_01 in CFW step 17 (180 Ringing): ensure that { when { UE_B sends a 180_response to UE_A } then { IMS_B sends the 180_response to IMS_A not containing a P-Charging-Function-Addresses_header } } TP_IMS_5131_02 in CFW step 24 (2xx) ensure that { when { UE_B sends a 2xx_response to UE_A } then { IMS_B sends the 180_response to IMS_A not containing a P-Charging-Function-Addresses_header } }		containing an orig-ioi_parameter
indicating operator_identifier of IMS_B TP_IMS_5115_03 in CFW step 17 (180 Ringing): ensure that { when { UE_B sends a 1xx_response to UE_A } } then { IMS_A receives the 1xx_response containing a P-Asserted-Identity_header indicating the SIP_URI of UE_B and containing a P-Asserted-Identity_header indicating the TeI_URI of UE_B } TP_IMS_5115_02 in CFW step 24 (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 a no rig-ioi_parameter indicating operator_identifier of IMS_A and containing a term-ioi_parameter indicating operator_identifier of IMS_B } TP_IMS_5115_04 in CFW step 24 (2xx): ensure that { when { UE_B sends a 2xx_response to UE_A } } then { IMS_A receives the 2xx_response to UE_A } } then { IMS_A receives the 2xx_response containing a P-Asserted-Identity_header indicating the SIP_URI of UE_B and containing a P-Asserted-Identity_header indicating the TeI_URI of UE_B } TP_IMS_5131_01 in CFW step 17 (180 Ringing): ensure that { when { UE_B sends a 180_response to UE_A } then { IMS_B sends the 180_response to UE_A } then { IMS_B sends the 180_response to UE_A } then { IMS_B sends the 180_response to UE_A } then { IMS_B sends the 180_response to UE_A } then { IMS_B sends the 180_response to UE_A } then { IMS_B sends the 180_response to UE_A } then { IMS_B sends the 180_response to UE_A } then { IMS_B sends the 180_response to UE_A } then { IMS_B sends the 180_response to UE_A } then { IMS_B sends the 180_response to IMS_B } }		indicating operator_identifier of IMS_A and
6 TP_IMS_5115_03 in CFW step 17 (180 Ringing): ensure that { when {UE_B sends a 1xx_response to UE_A } } then {IMS_A receives the 1xx_response 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 and containing a P-Asserted-Identity_header indicating the Tel_URI of UE_B } 7 TP_IMS_5115_02 in CFW step 24 (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 a P-Charging-Vector_header containing a term-ioi_parameter indicating operator_identifier of IMS_A and containing a term-ioi_parameter indicating operator_identifier of IMS_B } 8 TP_IMS_5115_04 in CFW step 24 (2xx): ensure that { when {UE_B sends a 2xx_response to UE_A } } then {IMS_A receives the 2xx_response 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 } 9 TP_IMS_5131_01 in CFW step 17 (180 Ringing): ensure that { when {UE_B sends a 180_response to UE_A } then {IMS_B sends the 180_response to UE_A } then {IMS_B sends the 180_response to IMS_A not containing a P-Charging-Function-Addresses_header } } 10 TP_IMS_5131_02 in CFW step 24 (2xx) ensure that { when {UE_B sends a 2xx_response to UE_A } then {IMS_B sends the 180_response to IMS_B } then {IMS_B sends the 2xx_response		containing a term-ioi_parameter
ensure that { when { UE_B sends a 1xx_response to UE_A } } then { IMS_A receives the 1xx_response 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 } 7 TP_IMS_5115_02 in CFW step 24 (2xx): ensure that { when { UE_B sends a 2xx_response to UE_A }		indicating operator_identifier of IMS_B
ensure that { when { UE_B sends a 1xx_response to UE_A } } then { IMS_A receives the 1xx_response 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 } 7 TP_IMS_5115_02 in CFW step 24 (2xx): ensure that { when { UE_B sends a 2xx_response to UE_A }		
when { UE_B sends a 1xx_response to UE_A } } then { IMS_A receives the 1xx_response 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 } } 7 TP_IMS_5115_02 in CFW step 24 (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-toi_parameter indicating operator_identifier of IMS_A and containing a term-ioi_parameter indicating operator_identifier of IMS_B } } 8 TP_IMS_5115_04 in CFW step 24 (2xx): ensure that { when { UE_B sends a 2xx_response to UE_A } } then { IMS_A receives the 2xx_response 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 } 9 TP_IMS_5131_01 in CFW step 17 (180 Ringing): ensure that { when { UE_B sends a 180_response to UE_A } then { IMS_B sends the 180_response to IMS_A not containing a P-Charging-Function-Addresses_header } } 10 TP_IMS_5131_02 in CFW step 24 (2xx) ensure that { when { UE_B sends a 2xx_response to UE_A } then { IMS_B sends the 180_response to UE_A } then { IMS_B sends the 180_response to IMS_A not containing a P-Charging-Function-Addresses_header } } }	6	1 1 2
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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} 7		}
indicating the SIP_URI of UE_B and containing a P-Asserted-Identity_header indicating the Tel_URI of UE_B} 7		
containing a P-Asserted-Identity_header indicating the Tel_URI of UE_B} 7		containing a P-Asserted-Identity_header
containing a P-Asserted-Identity_header indicating the Tel_URI of UE_B} 7		indicating the SIP_URI of UE_B and
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ensure that { when { UE_B sends a 2xx_response to UE_A } then { IMS_A receives the 2xx_response from IMS_B		not containing a P-Unarging-Function-Addresses_neader }
ensure that { when { UE_B sends a 2xx_response to UE_A } then { IMS_A receives the 2xx_response from IMS_B	10	TP_IMS_5131_02 in CFW sten 24 (2vv)
when { UE_B sends a 2xx_response to UE_A } then { IMS_A receives the 2xx_response from IMS_B	10	' ' '
then { IMS_A receives the 2xx_response from IMS_B		
not containing a P-Charging-Function-Addresses_header }		
		not containing a P-Charging-Function-Addresses_header }
}		}

Step				D	irectio	n				Message	Comment
	N e r ∢	U E A	I M S A	E N U M DB	I B C F A	I B C F B	- М S B	ВВС	U s e r B		
1		\rightarrow									User A calls User B
2			\rightarrow							INVITE	UE_A sends INVITE with the first SDP offer indicating all desired medias and codecs that UE_A supports
3		←								100 Trying	IMS_A responds with a 100 Trying provisional response

Step				Direc	ction					Message	Comment
		U E I	I E			I B	I M	U	U s		
	е	A :	S U			C	S	В	е		
	r A		A M Di			F B	В		r B		
4			\longrightarrow							ENUM	IMS_A sends query to ENUM DB
5										ENUM	ENUM DB sends response to IMS_A
6				\longrightarrow						INVITE	IMS_A forwards INVITE to IBCF_A
7										100 Trying	IBCF_A responds with a 100 Trying provisional response
8						•				INVITE	IBCF_A forwards INVITE to IBCF_B
9					\leftarrow	_				100 Trying	IBCF_B responds with a 100 Trying provisional response
10							>			INVITE	IBCF_B forwards INVITE to IMS_B
11						-				100 Trying	IMS_B responds with a 100 Trying provisional response
12								\		INVITE	IMS_B forwards INVITE to UE_B
13								-		100 Trying	UE_B optionally responds with a 100 Trying provisional response
14								F	\rightarrow		User B is informed of incoming call of User A
15								-		180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting
16						\leftarrow	-			180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
17					\longleftarrow	-				180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
18										180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
19		←								180 Ringing	IMS_A forwards the 180 Ringing response to UE_A
20											User A is informed that UE_B is ringing
21								—	+		User B answers call
22										200 OK	UE_B responds INVITE with 200 OK to indicate that the call has been answered
23										200 OK	IMS_B forwards 200 OK response to IBCF_B
24										200 OK	IBCF_B forwards 200 OK response to IBCF_A
25										200 OK	IBCF_A forwards 200 OK response to IMS_A
26		←—								200 OK	IMS_A forwards 200 OK response to UE_A
27	—										User A is informed that call has been answered
28		\longrightarrow								ACK	UE_A acknowledges the receipt of 200 OK for INVITE
29			<u> </u>	\longrightarrow						ACK	IMS_A forwards ACK to IBCF_A
30						,				ACK	IBCF_A forwards ACK to IBCF_B
31							>			ACK	IBCF_B forwards ACK to IMS_B
	I	I	ı l		1	1	I	ı	ı		



4.5.3.1.1.4 Rejection of call from barred user

	Interopera	bility Test Description							
Identifier:	TD_IMS_CALL_0003								
Summary:	IMS network does not esta	blish call to barred user							
Configuration:	CF_INT_CALL								
SUT:	IMS_B								
References:	Test Purpose	Specification Reference							
	TP_IMS_5108_05	TS 124 229 [1], clause 5.4.3.3 ¶8 (item 1 in 1 st numbered list)							
Use Case ref.:	UC_02_I								
Pre-test conditions:	 UE_A and UE_B have per clause 4.2.1 UE_A is registered in UE_B is registered in IMS_A within the trust 	IMS B is configured according to table 1 IP bearers established to their respective IMS networks as IMS_A using any user identity IMS_B using any user identity domain of IMS_B identities in IMS_B out of which one of has been barred							
Test Sequence:	Step								
	1 User A calls use	er B using barred user identity							
	Verify that user A is informed that call cannot be established								

	Interoperability Test Description										
Conformance	Check										
Criteria:	1	TP_IMS_5108_05 in CFW step 13 (404 response):									
		ensure that {									
		when { UE_A sends an initial INVITE to UE_B and									
		IMS_A sends the INVITE to IMS_B									
		containing a Request_URI									
		indicating a barred_user in IMS_B }									
		then { IMS_B sends 404_response to IMS_A }									
]}									

Step	Dir	rection		Message	Comment
	UUIE		U U		
	S E M N e A S U	B B M C C S	E s B e		
	r A M	F F B	r		
4	A DB	A B	B		Harri A celle Harri D
1	\mapsto \mid				User A calls User B
2	├			INVITE	UE_A sends INVITE with the first SDP offer indicating all desired medias and codecs that
3	 			100 Trying	IMS_A responds with a 100 Trying provisional response
4	$ \hspace{.05cm} \longrightarrow $			ENUM	IMS_A sends query to ENUM DB
5				ENUM	ENUM DB sends response to IMS_A
6		\rightarrow		INVITE	IMS_A forwards INVITE to IBCF_A
7		_		100 Trying	IBCF_A responds with a 100 Trying provisional response
8		$\longmapsto $		INVITE	IBCF_A forwards INVITE to IBCF_B
9				100 Trying	IBCF_B responds with a 100 Trying provisional response
10				INVITE	IBCF_B forwards INVITE to IMS_B
11				100 Trying	IMS_B responds with a 100 Trying provisional response
12				404 Not Found	IMS_B responds to the INVITE with 404 Not Found
13				404 Not Found	IBCF_B forwards 404 Not Found response to IBCF_A
14		_		404 Not Found	IBCF_A forwards 404 Not Found response to IMS_A
15				404 Not Found	IMS_A forwards 404 Not Found response to UE_A
16					User A is informed that call has failed
17				ACK	UE_A acknowledges the response
18		\rightarrow		ACK	IMS_A forwards ACK to IBCF_A
19				ACK	IBCF_A forwards ACK to IBCF_B
20				ACK	IBCF_B forwards ACK to IMS_B

4.5.3.1.1.5 Rejection of call to non-existing user

	Interoperability Test Description										
Identifier:	TD_IMS_CALL_0004										
Summary:	IMS network rejects call to non existing user										
Configuration:	CF_INT_C	CALL									
SUT:	IMS_B										
References:	Test Purp	oose	Specification Reference								
	TP_IMS_5	5132_01	TS 124 229 [1], clause 5.3.2.1 ¶54 (after 5 th numbered list)								
Use Case ref.:	UC_01_I		·								
Pre-test conditions:	 HSS of IMS_A and is configured according to table 1 UE_A have IP bearers established to their respective IMS networks as per clause 4.2.1 UE_A is registered in IMS_A using any user identity IMS_A within the trust domain of IMS_B 										
Test Sequence:	Step		: :: : : : : : : : : : : : : : : : : :								
	1	·	non existing identity within IMS_B domain								
	2	Verify that user A is informed that	t call cannot be established								
Conformance	Chask										
Criteria:	TP_IMS_5132_01 in CFW step 13 (404 Not Found): ensure that { when { UE_A sends an initial INVITE containing a Request_URI indicating a non_existing_user in IMS_B and IMS_A sends the INVITE to IMS_B} then { IMS_B sends an appropriate (e.g. 404 or 604) to IMS_A }										

Step				D:	irection					Massaga	Comment
Steh	U	U		E	I		1	U	U	Message	Comment
	s	E	М	N	В	В	М	E	s		
	e	Ā	S	Ü	C	C	S	В	e		
	r	_ ^	Ā	М	F	F	В		r		
	À			DB	A	В	-		В		
1		\rightarrow									User A calls User B
2			\rightarrow							INVITE	UE_A sends INVITE with the first SDP offer indicating all desired medias and codecs that
3		←								100 Trying	IMS_A responds with a 100 Trying provisional response
4				\rightarrow						ENUM	IMS_A sends query to ENUM DB
5			←	_						ENUM	ENUM DB sends response to IMS_A
6					\longrightarrow					INVITE	IMS_A forwards INVITE to IBCF_A
7			←							100 Trying	IBCF_A responds with a 100 Trying provisional response
8						\rightarrow				INVITE	IBCF_A forwards INVITE to IBCF_B
9					←					100 Trying	IBCF_B responds with a 100 Trying provisional response
10							\rightarrow			INVITE	IBCF_B forwards INVITE to IMS_B
11						\leftarrow				100 Trying	IMS_B responds with a 100 Trying provisional response
12						K —				404 Not Found	IMS_B responds to the INVITE with 404 Not Found
13					←					404 Not Found	IBCF_B forwards 404 Not Found response to IBCF_A

Step				Di	rection	1				Message	Comment
	U s e r A	U E A	M S A	E N U M DB	I B C F A	I B C F B	M S B	UEB	U s e r B		
14			\leftarrow	- -	_					404 Not Found	IBCF_A forwards 404 Not Found response to IMS_A
15		\leftarrow								404 Not Found	IMS_A forwards 404 Not Found response to UE_A
16	←										User A is informed that call has failed
17			\rightarrow							ACK	UE_A acknowledges the response
18				_ _	\rightarrow					ACK	IMS_A forwards ACK to IBCF_A
19						\rightarrow				ACK	IBCF_A forwards ACK to IBCF_B
20							\rightarrow			ACK	IBCF_B forwards ACK to IMS_B

4.5.3.1.1.6 Rejection of call to unavailable user

		Interoperability Test Desc	ription							
Identifier:	TD_IMS_CALL_0005									
Summary:	IMS network does not establish a call for unavailable user									
Configuration:	CF_INT_C	ALL								
SUT:	IMS_B									
References:	Test Purp	ose	Specification Reference							
	TP_IMS_5	133_01	TS 124 229 [1], clause 5.3.2.1 ¶55 (before 6 th numbered list)							
Use Case ref.:	UC_01_I									
Pre-test conditions:	UE_A clauseUE_AUE_B		eir respective IMS networks as per							
Test Sequence:	Step 1 2	User A calls a valid user B identi Verify that user A is informed tha	ty at user B is not reachable or equivalent							
Conformance Criteria:	Check 1 TP_IMS_5133_01 in CFW step 13 (4xx): ensure that { when { UE_A sends INVITE to UE_B } then { IMS_B sends a 4xx_response to IMS_A } }									

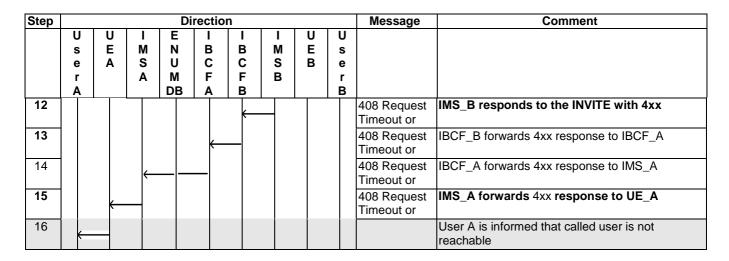
Step				Di	rectio	า				Message	Comment
	U s e r A	U E A	M S A	E N U M DB	I B C F A	— в с н в	— ⊠ ⊘ В	ВШС) s e r B		
1		\rightarrow									User A calls User B
2			\rightarrow							INVITE	UE_A sends INVITE with the first SDP offer indicating all desired medias and codecs that
3		\leftarrow	\dashv							100 Trying	IMS_A responds with a 100 Trying provisional response

Step				D	irectio	n				Message	Comment
	U	U	I	E	- 0	I D	I	UE	U		
	s e	A	M	N U	B	B	M S	B	s e		
	r		A	M	F	F	В		r		
	Α			DB	A	В			В	E N II IN 4	INC. A. J. SAUMADD
4			-	\rightarrow						ENUM	IMS_A sends query to ENUM DB
5			←	_						ENUM	ENUM DB sends response to IMS_A
6			_		\longrightarrow					INVITE	IMS_A forwards INVITE to IBCF_A
7			←							100 Trying	IBCF_A responds with a 100 Trying provisional response
8						\rightarrow				INVITE	IBCF_A forwards INVITE to IBCF_B
9					←					100 Trying	IBCF_B responds with a 100 Trying provisional response
10							\rightarrow			INVITE	IBCF_B forwards INVITE to IMS_B
11						\leftarrow				100 Trying	IMS_B responds with a 100 Trying provisional response
12						\leftarrow				4xx	IMS_B responds to the INVITE with 4xx
13					←					4xx	IBCF_B forwards 4xx response to IBCF_A
14			←							4xx	IBCF_A forwards 4xx response to IMS_A
15		(4xx	IMS_A forwards 4xx response to UE_A
16	(User A is informed that call has failed
17			\rightarrow							ACK	UE_A acknowledges the response
18			-	_	\longrightarrow					ACK	IMS_A forwards ACK to IBCF_A
19						\rightarrow				ACK	IBCF_A forwards ACK to IBCF_B
20							\rightarrow			ACK	IBCF_B forwards ACK to IMS_B
						→	-				

4.5.3.1.1.7 Initial request to non-registered user with terminating unregistered filter criterion

	Test Descri	ption
Identifier:	TD_IMS_CALL_0006	
Summary:		st to non-registered user with terminating
Configuration:	CF_INT_CALL	
SUT:	IMS_B	
References:	Test Purpose	Specification Reference
	TP_IMS_5109_01	TS 124 229 [1], clause 5.3.2.1 ¶76 (after 2 nd numbered list)
Use Case Ref.:	UC_01_I	
Pre-test conditions:	 per clause 4.2.1 UE_A has no filter criteria define IMS_B has terminating unregiste 	es established to their respective IMS networks as ed in HSS ered criterion set for UE_B on INVITE indicating and forward the INVITE to AS_B B identity
Test Sequence:	Step 1 User A calls user B (i.e. user B verify that user A is information)	serNOAS in IMS_B) ned that call cannot be established
Pass Criteria:	Check	
	ensure that { when { UE_A sends INV then { IMS_B receives th	

Step				Di	rectio	1				Message	Comment
	N e r ∢	UEA	M S A	E N U M DB	I B C F A	I B C F B	- М ⊗ В	U E B	S e r B		
1		\rightarrow									User A calls User B
2			\rightarrow							INVITE	UE_A sends INVITE with the first SDP offer indicating all desired medias and codecs that
3		\leftarrow								100 Trying	IMS_A responds with a 100 Trying provisional response
4				\rightarrow						ENUM	IMS_A sends query to ENUM DB
5			\leftarrow							ENUM	ENUM DB sends response to IMS_A
6					\rightarrow					INVITE	IMS_A forwards INVITE to IBCF_A
7				\leftarrow						100 Trying	IBCF_A responds with a 100 Trying provisional response
8						\rightarrow				INVITE	IBCF_A forwards INVITE to IBCF_B
9					←					100 Trying	IBCF_B responds with a 100 Trying provisional response
10							\rightarrow			INVITE	IBCF_B forwards INVITE to IMS_B
11						\leftarrow	\dashv			100 Trying	IMS_B responds with a 100 Trying provisional response

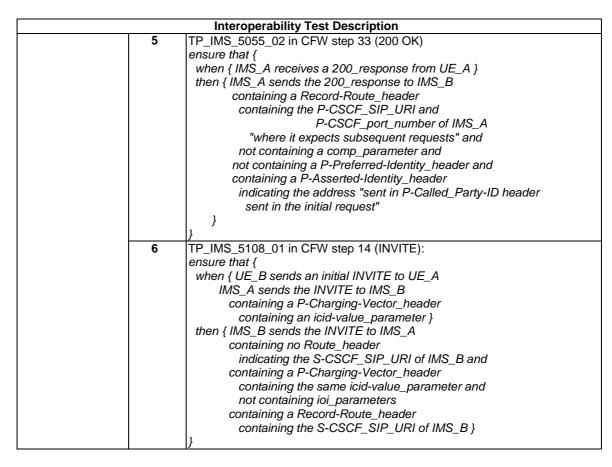


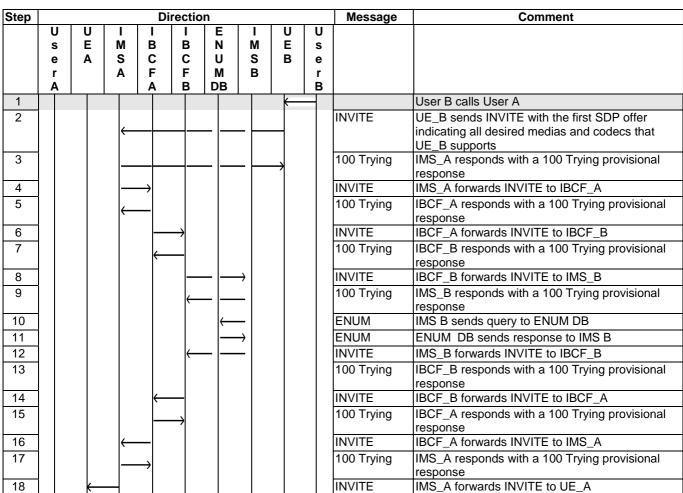
4.5.3.1.2 Dialogue Procedures with Roaming

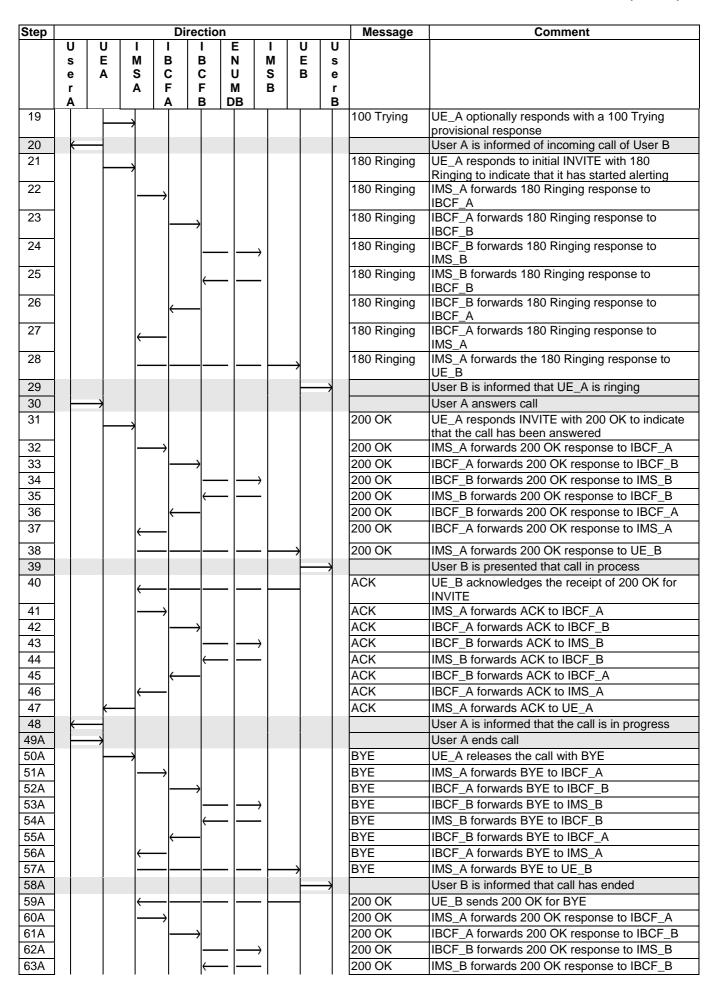
4.5.3.1.2.1 Normal call

		Interoperability Test Desc	ription
Identifier:	TD IMS (CALL_0007	•
Summary:	IMS netwo	ork handles normal call while UE_	B is roaming without topology hiding
-	correctly		
Configuration:	CF_ROAN	//_CALL	
SUT:	IMS_A		
References:	Test Purp	ose	Specification Reference
	TP_IMS_5	5046_01	TS 124 229 [1], clause 5.2.6.3.3 ¶1 (1 st numbered list)
	TP_IMS_5	5070_01	TS 124 229 [1], clause 5.2.7.3 ¶3
	TP_IMS_5		TS 124 229 [1], clause 5.4.3.3 ¶126 (10 th numbered list)
	TP_IMS_5	5055_01	TS 124 229 [1], clause 5.2.6.4.4 ¶1 (1 st numbered list)
	TP_IMS_5	5055_02	TS 124 229 [1], clause 5.2.6.4.4 ¶1 (1 st numbered list
	TP_IMS_5	5108_01	TS 124 229 [1], clause 5.4.3.3 ¶5 (1 st numbered list)
Use Case ref.:	UC_02_R		
Pre-test conditions:	UE_AUE_BIMS_A	of IMS_A and of IMS B is configured and UE_B have IP bearers estable is registered in IMS_A using any B is registered in IMS_B via IMS_A within the trust domain of IMS_I vice-Route header list exists for L	olished to IMS_A as per clause 4.2.1 user identity A using any user identity B
Test Sequence:	Step		
rest ocquerioc.	1	User B calls User A	
	2	Verify that user A is informed of	incoming call of User B
	3	Verify that user B is informed that	
	4	User A answers call	
	5	Verify that user B is informed that	at call has been answered
	6	Verify that user A is informed that	
	7	User A ends call	
	8	Verify that user B is informed that	at call has ended

		Interoperability Test Description
Conformance	Check	
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
	2	containing an actives of OL_Band containing a P-Charging-Vector_header containing an icid-value_parameter } } TP_IMS_5070_01 in CFW step 15 (100 Trying) ensure that { when { IMS_A receives an initial INVITE from IMS_B } then { IMS_A sends a 100_response to IMS_B }
	3	TP_IMS_5301_01 in CFW step 52A (BYE) ensure that { when { UE_A sends BYE to UE_B } then { IMS_B receives the BYE not containing Route_header indicating the S-CSCF_SIP_URI of IMS_A containing an additional topmost Record-Route_header indicating the S-CSCF_SIP_URI of IMS_A }
	4	TP_IMS_5055_01 in CFW step 23 (180 Ringing) ensure that { when { IMS_A receives a 180_response from UE_A } then { IMS_A sends a 180_response to IMS_B



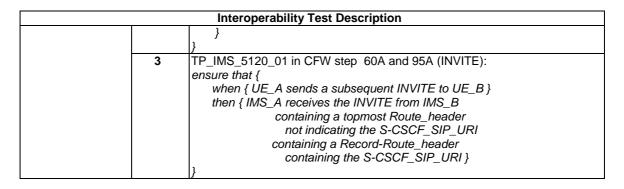


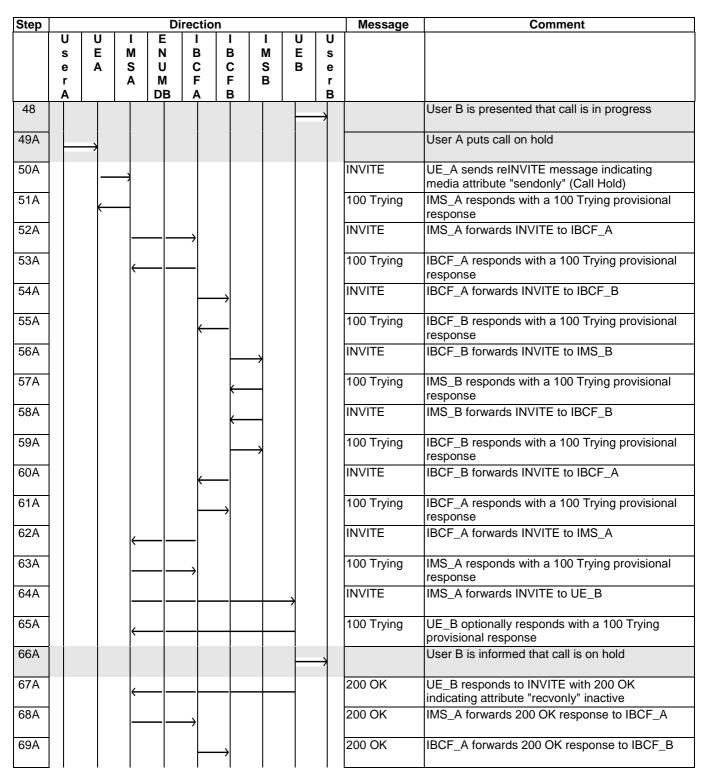


Step				Di	rectio	n				Message	Comment
	C	U	ı		ı	Е	ı	U	U		
	s	E	M	В	В	N	M	Е	S		
	е	Α	S	С	С	U	S	В	е		
	r		Α	F	F	М	В		r		
	Α			Α	В	DB			В		
64A				\downarrow						200 OK	IBCF_B forwards 200 OK response to IBCF_A
65A			\leftarrow	_						200 OK	IBCF_A forwards 200 OK response to IMS_A
66A		\leftarrow								200 OK	IMS_A forwards the 200 OK response to UE_A
67A	\leftarrow										User A is informed that call has ended

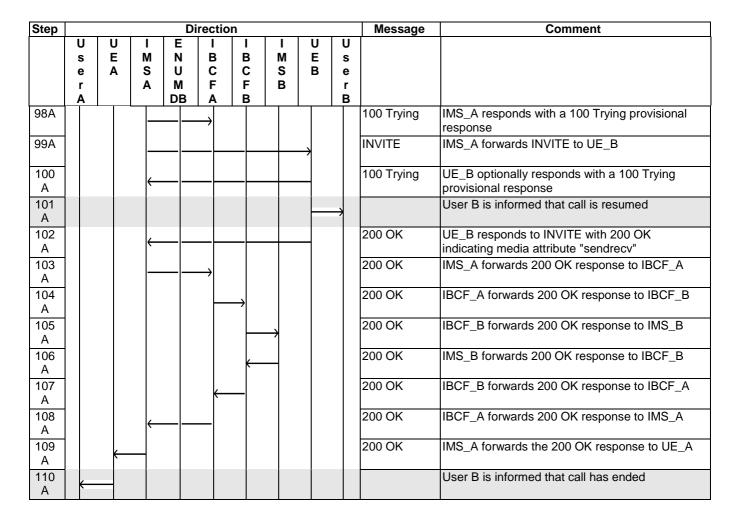
4.5.3.1.2.2 Normal call with hold/resume

		Interoperability Test Description
Identifier:	TD IMS	CALL_0008
Summary:		ork handles subsequent INVITEs correctly in case of a user initiated call hold
,		me when home caller puts roaming user on hold and resumes call
Configuration:	CF_ROA	
SUT:	IMS_A	
References:	Test Pur	pose Specification Reference
	TP_IMS_	
	TP_IMS_	
	TP_IMS_	
	11 _1110_	(item 3 and 5 in 7 th numbered list)
Use Case ref.:	UC_03 R	
000 0000 10111	00_00 I	
Pre-test	a HSS	of IMS_A and of IMS B is configured according to table 1
conditions:		A and UE_B have IP bearers established to their respective IMS networks as
		clause 4.2.1
		A configured to perform user initiated hold/resume using INVITE
		A configured to perform user initiated hold/resume using inverte. A is registered in IMS_A using any user identity
		B is registered in IMS_B via IMS_A using any user identity
	I OE_	b is registered in tivio_b via tivio_A using any user identity
Test Sequence:	Step	
rest bequeite.	1	User A calls User B
	2	Verify that user B is informed of incoming call of User A
	3	Verify that user A is informed that UE_A is ringing
	4	User B answers call
	5	Verify that user A is informed that call has been answered
	6	Verify that user B is informed that call has been answered Verify that user B is informed that call is established
	7	User A puts call on hold
	8	Verify that user B is informed that call is on hold
	9	Verify that user A is informed that call is on hold
	_	User A resumes call
	10	
	11	Verify that user B is informed that call is resumed
	12	Verify that user A is informed that call is resumed
	13	User A ends call
	14	Verify that user B is informed that call has ended
	15	Verify that user A is informed that call has ended
Conformance	Chaale	
Criteria:	Check 1	TD IMC 5004 04 in CDM stan 64A and 06A (400 Truing).
Ciliteria.		TP_IMS_5081_01 in CFW step 61A and 96A (100 Trying): ensure that {
		when { UE_A sends a subsequent INVITE to UE_B and
		IMS_A receives the INVITE from IMS_B }
		then { IMS_A sends a 100_response to IMS_B }
		then \ none_A serius a 100_response to none_B \
	2	TP_IMS_5082_01 in CFW step 69A and 104A (200 OK):
		ensure that {
		when { IMS_A receives a 200_response from UE_B }
		then { IMS_A sends the 200_response to IMS_B
		containing a P-Charging-Vector_header
		containing at r-onarging-vector_neader
		access-network-charging-info_parameter
ı		1 seeses sarging into_parameter



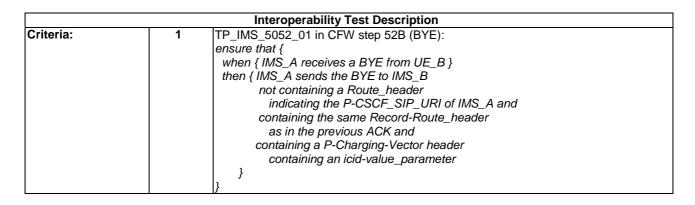


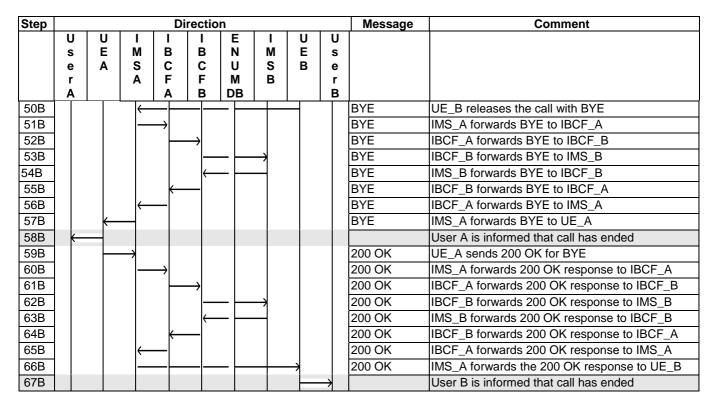
Step				Di	rectio	n				Message	Comment
	U s	UE	M	E N	ΙВ	I B	I M	U E	U		
	e	Ā	S	U	С	С	S	В	e		
	r A		Α	M DB	F	F B	В		r B		
70A						<u> </u>	\rightarrow			200 OK	IBCF_B forwards 200 OK response to IMS_B
71A						—				200 OK	IMS_B forwards 200 OK response to IBCF_B
72A					←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
73A			\leftarrow							200 OK	IBCF_A forwards 200 OK response to IMS_A
74A		\leftarrow								200 OK	IMS_A forwards 200 OK response to UE_A
75A			\rightarrow							ACK	UE_A acknowledges the receipt of 200 OK for INVITE
76A					\rightarrow					ACK	IMS_A forwards ACK to IBCF_A
77A						\longrightarrow				ACK	IBCF_A forwards ACK to IBCF_B
78A							\rightarrow			ACK	IBCF_B forwards ACK to IMS_B
79A						—				ACK	IMS_B forwards ACK to IBCF_B
80A					(ACK	IBCF_B forwards ACK to IBCF_A
81A			←							ACK	IBCF_A forwards ACK to IMS_A
82A								\rightarrow		ACK	IMS_A forwards ACK to UE_B
83A	(-									User A is informed that call is on hold
84A		\rightarrow									User A resumes call
85A		-	\rightarrow							INVITE	UE_A sends reINVITE message indicating media attribute "sendrecv" (Call Resume)
86A		—								100 Trying	IMS_A responds with a 100 Trying provisional response
87A					\rightarrow					INVITE	IMS_A forwards INVITE to IBCF_A
88A			\leftarrow		_					100 Trying	IBCF_A responds with a 100 Trying provisional response
89A						\longrightarrow				INVITE	IBCF_A forwards INVITE to IBCF_B
90A					\leftarrow					100 Trying	IBCF_B responds with a 100 Trying provisional response
91A							\rightarrow			INVITE	IBCF_B forwards INVITE to IMS_B
92A						—	_			100 Trying	IMS_B responds with a 100 Trying provisional response
93A						←				INVITE	IMS_B forwards INVITE to IBCF_B
94A							\rightarrow			100 Trying	IBCF_B responds with a 100 Trying provisional response
95A					\leftarrow					INVITE	IBCF_B forwards INVITE to IBCF_A
96A						\longrightarrow				100 Trying	IBCF_A responds with a 100 Trying provisional response
97A			\leftarrow		_					INVITE	IBCF_A forwards INVITE to IMS_A



4.5.3.1.2.3 Subsequent request (other than target refresh)

		Interoperability Test Descrip	tion
Identifier:	TD_IMS_C	ALL_0009	
Summary:			quent requests (other than target refresh)
	received fro	om the UE before forwarding them to a	nother IMS network.
Configuration:	CF_ROAM	_CALL	
SUT:	IMS_A		
References:	Test Purpo		Specification Reference
	TP_IMS_50	052_01	TS 124 229 [1], clause 5.2.6.3-9 ¶1 (1 st numbered list)
Use Case ref.:	UC_02_R		,
Pre-test conditions:	UE_B IUE_A I	f IMS_A and of IMS B is configured acc has IP bearers established to their resp registered in IMS_A using any user ide is registered in IMS_B via IMS_A using	pective IMS networks as per clause 4.2.1
Test Sequence:	Step		
	1	User B calls User A	
	2	Verify that user A is informed of incom	ning call of User B
	3	Verify that user B is informed that UE_	_A is ringing
	4	User A answers call	
	5	Verify that user B is informed that call	has been answered
	6	Verify that user A is informed that the	call is established
	7	User B ends call	
	8	Verify that user A is informed that call	
	9	Verify that user B is informed that call	has ended
Conformance	Check		

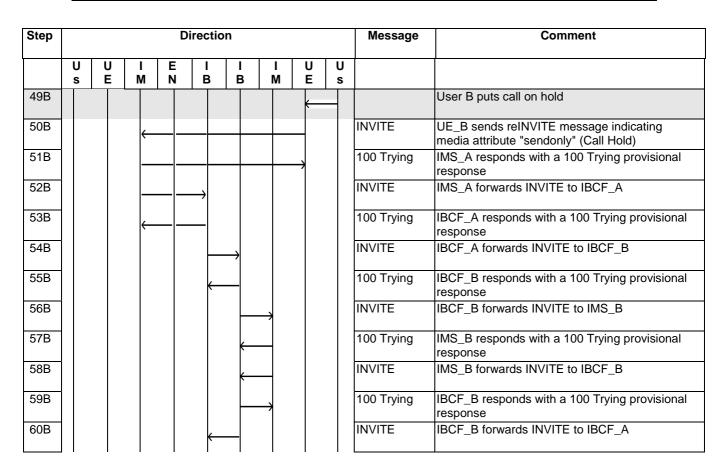




4.5.3.1.2.4 Subsequent target refresh request (INVITE)

	Interoperability T	est Description
Identifier:	TD_IMS_CALL_0010	
Summary:		INVITEs correctly in case of a user initiated call hold outs a home user on hold and resumes call
Configuration:	CF_ROAM_CALL	
SUT:	IMS_A	
References:	Test Purpose	Specification Reference
	TP_IMS_5048_01	TS 124 229 [1], clause 5.2.6.3.5 ¶1 (1 st numbered list)
	TP_IMS_5080_01	TS 124 229 [1], clause 5.2.9.1 ¶2
Use Case ref.:	UC_03_R	
Pre-test conditions:	 UE_A and UE_B have IP beat per clause 4.2.1 UE_B configured to perform user UE_A registered in IMS_A user 	s configured according to table 1 Irers established to their respective IMS networks as User initiated hold/resume using INVITE Ing any user identity Via IMS_A using any user identity
Test Sequence:	Step	
ĺ	1 User B calls User A	

		Interoperability Test Description
	2	Verify that user A is informed of incoming call of User B
	3	Verify that user B is informed that UE_A is ringing
	4	User A answers call
	5	Verify that user B is informed that call has been answered
	6	Verify that user A is informed that call is established
	7	User B puts call on hold
	8	Verify that user A is informed that call is on hold
	9	Verify that user B is informed that call is on hold
	10	User B resumes call
	11	Verify that user A is informed that call is resumed
	12	Verify that user B is informed that call is resumed
	13	User A ends call
	14	Verify that user B is informed that call has ended
	15	Verify that user A is informed that call has ended
	10	Verify that user A is informed that call has ended
Canfarmanaa	Chaole	
Conformance	Check	
Critoria	4	TD IMC 5049 04 in CEM stop 54D and 90D (INIVITE).
Criteria:	1	TP_IMS_5048_01 in CFW step 54B and 89B (INVITE):
Criteria:	1	ensure that {
Criteria:	1	ensure that { when { IMS_A receives a subsequent INVITE from UE_B }
Criteria:	1	ensure that { when { IMS_A receives a subsequent INVITE from UE_B } then { IMS_A sends the INVITE to IMS_B
Criteria:	1	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
Criteria:	1	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
Criteria:	1	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
Criteria:	1	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
Criteria:	1	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
Criteria:	1	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
Criteria:	2	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
Criteria:	·	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
Criteria:	·	ensure that { when { IMS_A receives a subsequent INVITE from UE_B } then { IMS_A sends the INVITE to IMS_B
Criteria:	·	ensure that { when { IMS_A receives a subsequent INVITE from UE_B } then { IMS_A sends the INVITE to IMS_B
Criteria:	·	ensure that { when { IMS_A receives a subsequent INVITE from UE_B } then { IMS_A sends the INVITE to IMS_B
Criteria:	·	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



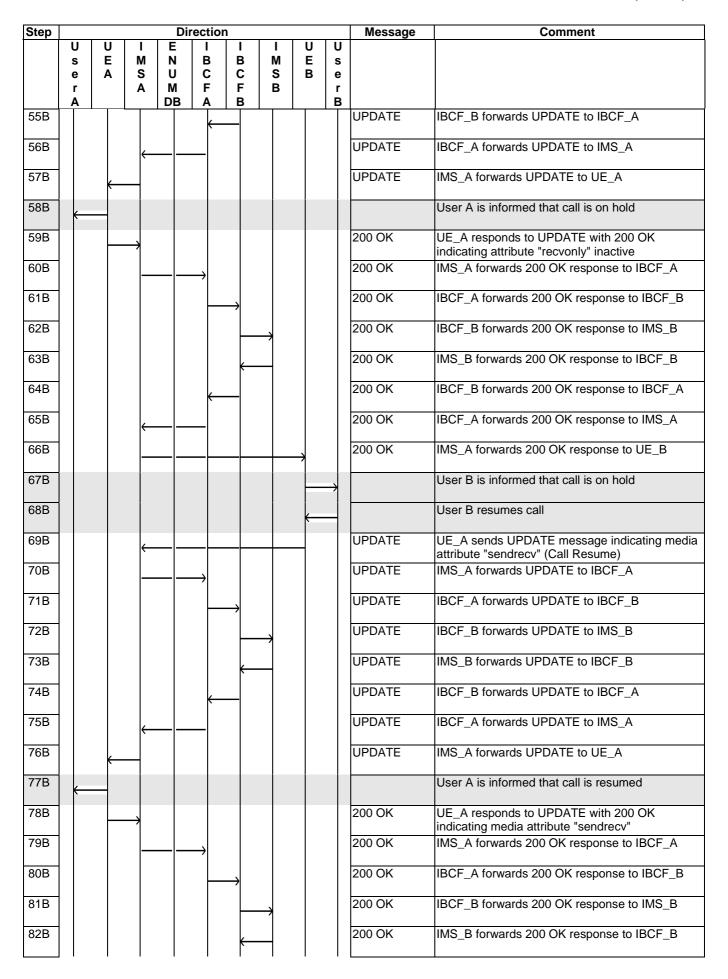
Step				D	irec	tion					Message	Comment
	U s	U E	I M	E N	I B		I B	I M	U E	U		
61B)				100 Trying	IBCF_A responds with a 100 Trying provisional response
62B			\leftarrow	_ -							INVITE	IBCF_A forwards INVITE to IMS_A
63B					\longrightarrow						100 Trying	IMS_A responds with a 100 Trying provisional response
64B		←									INVITE	IMS_A forwards INVITE to UE_A
65B			\rightarrow								100 Trying	UE_A optionally responds with a 100 Trying provisional response
66B	←											User A is informed that call is on hold
67B		H	\rightarrow								200 OK	UE_A responds to INVITE with 200 OK indicating attribute "recvonly" inactive
68B				_ _	\rightarrow						200 OK	IMS_A forwards 200 OK response to IBCF_A
69B					-		>				200 OK	IBCF_A forwards 200 OK response to IBCF_B
70B								\rightarrow			200 OK	IBCF_B forwards 200 OK response to IMS_B
71B								4			200 OK	IMS_B forwards 200 OK response to IBCF_B
72B					•	(-				200 OK	IBCF_B forwards 200 OK response to IBCF_A
73B			←								200 OK	IBCF_A forwards 200 OK response to IMS_A
74B								-	\rightarrow		200 OK	IMS_A forwards 200 OK response to UE_B
75B			\leftarrow					_			ACK	UE_B acknowledges the receipt of 200 OK for INVITE
76B					\longrightarrow						ACK	IMS_A forwards ACK to IBCF_A
77B					-		>				ACK	IBCF_A forwards ACK to IBCF_B
78B								\rightarrow			ACK	IBCF_B forwards ACK to IMS_B
79B											ACK	IMS_B forwards ACK to IBCF_B
80B					k	(-				ACK	IBCF_B forwards ACK to IBCF_A
81B			←								ACK	IBCF_A forwards ACK to IMS_A
82B		—									ACK	IMS_A forwards ACK to UE_A
83B	\leftarrow											User A is informed that call is on hold
84B									(User B resumes call
85B			\leftarrow								INVITE	UE_B sends reINVITE message indicating media attribute "sendrecv" (Call Resume)
86B								\bot	\rightarrow		100 Trying	IMS_A responds with a 100 Trying provisional response
87B			_		\longrightarrow						INVITE	IMS_A forwards INVITE to IBCF_A
88B			\leftarrow								100 Trying	IBCF_A responds with a 100 Trying provisional response
89B					-		>				INVITE	IBCF_A forwards INVITE to IBCF_B

Step	Direction												Message	Comment
	U s	U	I		E N	I B		I B	ı	I VI	U E	U		
90B				·		•	<u>, </u>			I			100 Trying	IBCF_B responds with a 100 Trying provisional response
91B								_	\rightarrow				INVITE	IBCF_B forwards INVITE to IMS_B
92B								\leftarrow					100 Trying	IMS_B responds with a 100 Trying provisional response
93B								\leftarrow					INVITE	IMS_B forwards INVITE to IBCF_B
94B									\rightarrow				100 Trying	IBCF_B responds with a 100 Trying provisional response
95B						•	<u>, </u>	_					INVITE	IBCF_B forwards INVITE to IBCF_A
96B						-		\rightarrow					100 Trying	IBCF_A responds with a 100 Trying provisional response
97B					-	_							INVITE	IBCF_A forwards INVITE to IMS_A
98B					-	\rightarrow							100 Trying	IMS_A responds with a 100 Trying provisional response
99B		←											INVITE	IMS_A forwards INVITE to UE_A
100B			\longrightarrow										100 Trying	UE_A optionally responds with a 100 Trying provisional response
101B	—													User A is informed that call is resumed
102B		-	\longrightarrow										200 OK	UE_A responds to INVITE with 200 OK indicating media attribute "sendrecv"
103B					-	\rightarrow							200 OK	IMS_A forwards 200 OK response to IBCF_A
104B						-		\rightarrow					200 OK	IBCF_A forwards 200 OK response to IBCF_B
105B									\rightarrow				200 OK	IBCF_B forwards 200 OK response to IMS_B
106B								\leftarrow					200 OK	IMS_B forwards 200 OK response to IBCF_B
107B						•	<u>. </u>	_					200 OK	IBCF_B forwards 200 OK response to IBCF_A
108B					←	_							200 OK	IBCF_A forwards 200 OK response to IMS_A
109B						_		_			\rightarrow		200 OK	IMS_A forwards the 200 OK response to UE_B
110B												\rightarrow		User B is informed that call is resumed

4.5.3.1.2.5 Subsequent target refresh request (UPDATE), roaming user initiated

		Interoperability Test D	escription							
Identifier:	TD IMS	CALL_0011	real production of the control of th							
Summary:			ATEs correctly in case of a user initiated call							
,			uts a home user on hold and resumes call							
Configuration:	CF_ROA									
SUT:	IMS_A									
References:	Test Pur	pose	Specification Reference							
	TP_IMS		TS 124 229 [1], clause 5.2.9.1 ¶2							
Use Case ref.:	UC_04_F		1 1							
Pre-test	 HSS 	of IMS_A and of IMS B is con	figured according to table 1							
conditions:			their respective IMS networks as per							
		se 4.2.1								
	• UE /	A registered in IMS_A								
			nitiated hold/resume using UPDATE							
		B is registered in IMS_B via IM	· · · · · · · · · · · · · · · · · · ·							
		3.44	<u> </u>							
Test Sequence:	Step									
-	1	User B calls User A								
	2	Verify that user A is informed of incoming call of User A								
	3	3 Verify that user B is informed that UE_A is ringing								
	4 User A answers call									
	5									
	6	Verify that user B is informed	I that call is established							
	7	User B puts call on hold								
	8	Verify that user A is informed	I that call is on hold							
	9	Verify that user B is informed								
	10	User B resumes call								
	11	Verify that user A is informed	I that call is resumed							
	12	Verify that user B is informed								
	13	User A ends call								
	14	Verify that user B is informed	I that call has ended							
	15	Verify that user A is informed								
Conformance	Check									
Criteria:		TD 1140 5000 00 : 0711	50D 100D (UDD 4.TE)							
	1	TP_IMS_5080_02 in CFW st	ep 50B and 68B (UPDATE):							
		ensure that {	and the second LIDDATE for the LIE D.)							
			sequent UPDATE from UE_B }							
		then { IMS_A sends the UP								
		containing a P-Chargin								
		containing an upda	ted access-network-charging-info_parameter}							
	1	}								

Step				Dir	ection	1				Message	Comment
	U s e r	U E A	M S A	E N U M	I B C F	I B C F	M S B	U E B	U s e r		
	Α			DB	Α	В			В		
49B								—			User B puts call on hold
50B			\leftarrow							UPDATE	UE_B sends UPDATE message indicating media attribute "sendonly" (Call Hold)
51B			_		\rightarrow					UPDATE	IMS_A forwards UPDATE to IBCF_A
52B						\rightarrow				UPDATE	IBCF_A forwards UPDATE to IBCF_B
53B							\rightarrow			UPDATE	IBCF_B forwards UPDATE to IMS_B
54B						←	_			UPDATE	IMS_B forwards UPDATE to IBCF_B



Step				Dir	ection	1				Message	Comment
	U	U	I	Е	I	_	I	U	U		
	S	E	M	N	B	B	M	E B	S		
	e r	Α	A	U M	F	F	B	В	e		
	Å		^	DB	A	В			В		
83B					←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
84B			←							200 OK	IBCF_A forwards 200 OK response to IMS_A
85B								\rightarrow		200 OK	IMS_A forwards the 200 OK response to UE_B
86B											User B is informed that call is resumed

4.5.3.1.2.6 Subsequent target refresh request (UPDATE), home user initiated

		Interoperability Tes	t Description
Identifier:	TD IMS	CALL_0012	. 2000 i pilo i
Summary:			PDATEs correctly in case of a user initiated call
Cummary.	hold and	resume when home caller r	outs a roaming user on hold and resumes call
Configuration:	CF_ROA		ato a rounning accir on field and rocaffico dan
SUT:	IMS_A	VI_O/ (EE	
References:	Test Purp	2050	Specification Reference
ixelefelices.	TP_IMS_		TS 124 220 [1] clause 5.4.3.3 ¶00
	TT _IIVIO	5120_02	TS 124 229 [1], clause 5.4.3.3 ¶99 (item 3 and 5 in 7 th numbered list)
Use Case ref.:	UC_03_R		Intern 3 and 3 in 7 Humbered list)
Ose Gase Ter	UC_03_I		
Pre-test	HSS	of IMS A and of IMS B is o	onfigured according to table 1
conditions:			s established to their respective IMS networks as
conditions.	_	lause 4.2.1	s established to their respective livis hetworks as
			r initiated hold/resume using UPDATE
		A registered in IMS_A using	
	• UE_E	s is registered in livis_b via	IMS_A using any user identity
Test Sequence:	Step		
rest Sequence.	1	User A calls User B	
	2		ned of incoming call of User A
	3	Verify that user A is inform	
	4	User B answers call	ied triat OE_A is finging
	5		ned that call has been answered
	6		ned that call has been answered
	7	User A puts call on hold	ieu triat can is establisheu
	8	Verify that user B is inform	and that call is an hold
	9	Verify that user A is inform	
	10	User A resumes call	ied that can is on hold
	11	Verify that user B is inform	and that call is required
	12	Verify that user A is inform	
	13	User A ends call	led that can is resumed
	14	Verify that user B is inform	and that call has anded
	15	Verify that user A is inform	
	15	Verily that user A is illion	led that call has ended
Conformance	Check		
Criteria:	1	TP IMS 5120 02 in CEW	step 55A and 74A (UPDATE):
Orneria.		ensure that {	step 33A and 74A (Of DATE).
		when { UE_A sends a	n UPDATE to UE_B }
			the UPDATE from IMS_B
			omost Route_header
			g the S-CSCF_SIP_URI
			ecord-Route_header
			e S-CSCF_SIP_URI }
		}	,
	·	I/	

Step				Di	rection	on				Message	Comment
	U s	UE	I M	EN	I B	I B	I M	U	U		
	e	Ā	S	U	С	С	S	В	e		
	r A		Α	M DB	F	F B	В		r B		
49A		\rightarrow									User A puts call on hold
50A		_								UPDATE	UE_A sends UPDATE message indicating media attribute "sendonly" (Call Hold)
51A				_	\rightarrow					UPDATE	IMS_A forwards UPDATE to IBCF_A
52A						\longrightarrow				UPDATE	IBCF_A forwards UPDATE to IBCF_B
53A							\rightarrow			UPDATE	IBCF_B forwards UPDATE to IMS_B
54A						←				UPDATE	IMS_B forwards UPDATE to IBCF_B
55A					←					UPDATE	IBCF_B forwards UPDATE to IBCF_A
56A			\leftarrow							UPDATE	IBCF_A forwards UPDATE to IMS_A
57A			-					\rightarrow		UPDATE	IMS_A forwards UPDATE to UE_B
58A									\rightarrow		User B is informed that call is on hold
59A			\leftarrow			_				200 OK	UE_B responds to UPDATE with 200 OK indicating attribute "recvonly" inactive
60A				_	\rightarrow					200 OK	IMS_A forwards 200 OK response to IBCF_A
61A						\longrightarrow				200 OK	IBCF_A forwards 200 OK response to IBCF_B
62A							\rightarrow			200 OK	IBCF_B forwards 200 OK response to IMS_B
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			\leftarrow							200 OK	IBCF_A forwards 200 OK response to IMS_A
66A		←								200 OK	IMS_A forwards 200 OK response to UE_A
67A	←										User A is informed that call is on hold
68A		\rightarrow									User A resumes call
69A			\rightarrow							UPDATE	UE_A sends UPDATE message indicating media attribute "sendrecv" (Call Resume)
70A				_	\rightarrow					UPDATE	IMS_A forwards UPDATE to IBCF_A
71A						\longrightarrow				UPDATE	IBCF_A forwards UPDATE to IBCF_B
72A							\rightarrow			UPDATE	IBCF_B forwards UPDATE to IMS_B
73A						←				UPDATE	IMS_B forwards UPDATE to IBCF_B
74A					←					UPDATE	IBCF_B forwards UPDATE to IBCF_A
75A			←		_					UPDATE	IBCF_A forwards UPDATE to IMS_A
76A								\rightarrow		UPDATE	IMS_A forwards UPDATE to UE_B
	I	I	I	I	I	I		ı	1		

Name	Step				Dire	ction)				Message	Comment
C						I B	I B	I M		_		
Name		е		S	Ü	С	С	S		е		
200 OK							_					
indicating media attribute "sendrecv" 200 OK IMS_A forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to UE_A 200 OK IBCF_B forwards 200 OK response to UE_A 200 OK IBCF_B forwards UPDATE message indicating media attribute "sendonly" (Call Hold) UPDATE IBCF_B forwards UPDATE to IBCF_B UPDATE IBCF_B forwards UPDATE to IBCF_A UPDATE IBCF_B forwards UPDATE to UE_A UPDATE IBCF_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_B 200 OK IBCF_A forwards 200 OK response to IBCF_B 200 OK IBCF_A forwards 200 OK response to IBCF_B	77A									\rightarrow		User B is informed that call is resumed
80A 81A 82A 83A 83A 84A 85A 85A 86A 86A 86A 86A 86A 86A 86A 86A 86A 86	78A			←	_							indicating media attribute "sendrecv"
200 OK IBCF_B forwards 200 OK response to IMS_B	79A					→					200 OK	IMS_A forwards 200 OK response to IBCF_A
82A 83A 84A 84A 85A 86A 86A 86A 86B	80A						\rightarrow				200 OK	IBCF_A forwards 200 OK response to IBCF_B
200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_A forwards 200 OK response to IMS_A 200 OK IMS_A forwards the 200 OK response to UE_A 366A 49B User A is informed that call has resumed User B puts call on hold UPDATE IWS_B ends UPDATE message indicating media attribute "sendonly" (Call Hold) UPDATE IBCF_A forwards UPDATE to IBCF_B UPDATE IBCF_B forwards UPDATE to IBCF_B UPDATE IBCF_B forwards UPDATE to IBCF_B UPDATE IBCF_B forwards UPDATE to IBCF_A UPDATE IBCF_B forwards UPDATE to IBCF_A UPDATE IBCF_A forwards 200 OK response to IBCF_A UPDATE IBCF_A forwards 200 OK response to IBCF_A UPDATE IBCF_A forwards 200 OK response to IBCF_B 200 OK IBCF_A forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_B	81A							\rightarrow			200 OK	IBCF_B forwards 200 OK response to IMS_B
200 OK IBCF_A forwards 200 OK response to IMS_A 200 OK IMS_A forwards the 200 OK response to UE_A 300 OK IMS_A forwards the 200 OK response to UE_A 498 498 498 499 409 409 409 409 409 409 409 508 508 508 509 508 509 509 509 509 509 509 509 509 509 509	82A						—				200 OK	IMS_B forwards 200 OK response to IBCF_B
85A 86A 49B 49B 50B 50B 50B 51B 52B 53B 54B 55B 56B 56B 57B 56B 57B 58B 59B 60B 59B 60B 61B 62B 62B 63B 64B 66B	83A					←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
User A is informed that call has resumed User B puts call on hold UPDATE UE_B sends UPDATE message indicating media attribute "sendonly" (Call Hold) UPDATE IMS_A forwards UPDATE to IBCF_A UPDATE IBCF_A forwards UPDATE to IBCF_B UPDATE IBCF_B forwards UPDATE to IBCF_B UPDATE IBCF_B forwards UPDATE to IBCF_B UPDATE IBCF_B forwards UPDATE to IBCF_A UPDATE IBCF_B forwards UPDATE to IBCF_A UPDATE IBCF_A forwards UPDATE to IBCF_A UPDATE IBCF_B forwards UPDATE to IBCF_A UPDATE IBCF_B forwards UPDATE to IBCF_B UPDATE IBCF_B forwards 200 OK response to IBCF_A UPDATE IBCF_B forwards 200 OK response to IBCF_B UPDATE IBCF_B forwards 200 OK response to IBCF_A	84A			\leftarrow		-					200 OK	IBCF_A forwards 200 OK response to IMS_A
UPDATE UE_B sends UPDATE message indicating media attribute "sendonly" (Call Hold) UPDATE IIMS_A forwards UPDATE to IBCF_A UPDATE IBCF_A forwards UPDATE to IBCF_B UPDATE IBCF_B forwards UPDATE to IBCF_B UPDATE IBCF_B forwards UPDATE to IBCF_B UPDATE IBCF_B forwards UPDATE to IBCF_A UPDATE IBCF_A forwards UPDATE to UBCF_A UPDATE IMS_A forwards UPDATE to UBCF_A UPDATE IMS_A forwards UPDATE to UBCF_A UPDATE IMS_A forwards 200 OK response to IBCF_A IMS_A forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_B 200 OK IMS_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_B	85A		—								200 OK	IMS_A forwards the 200 OK response to UE_A
UPDATE UE_B sends UPDATE message indicating media attribute "sendonly" (Call Hold) UPDATE IMS_A forwards UPDATE to IBCF_A UPDATE IBCF_B forwards UPDATE to IBCF_B UPDATE IBCF_B forwards UPDATE to IBCF_B UPDATE IBCF_B forwards UPDATE to IBCF_B UPDATE IBCF_B forwards UPDATE to IBCF_A UPDATE IBCF_B forwards UPDATE to IBCF_A UPDATE IBCF_B forwards UPDATE to IMS_A UPDATE IBCF_A forwards UPDATE to IMS_A UPDATE IMS_A forwards UPDATE to UE_A UPDATE IMS_A forwards UPDATE to IMS_A UPDATE IMS_A forwards UPDATE to IBCF_A UPDATE IMS_A forwards UPDATE to IBCF_A UPDATE IMS_A forwards UPDATE to IBCF_A UPDATE IBCF_A forwards 200 OK response to IBCF_A UPDATE IMS_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A	86A	—										User A is informed that call has resumed
attribute "sendonly" (Call Hold) UPDATE IMS_A forwards UPDATE to IBCF_A UPDATE IBCF_A forwards UPDATE to IBCF_B UPDATE IBCF_B forwards UPDATE to IBCF_B UPDATE IMS_B forwards UPDATE to IBCF_B UPDATE IMS_B forwards UPDATE to IBCF_A UPDATE IBCF_B forwards UPDATE to IBCF_A UPDATE IBCF_A forwards UPDATE to IBCF_A UPDATE IBCF_A forwards UPDATE to IBCF_A UPDATE IMS_A forwards UPDATE to UE_A UPDATE IMS_A forwards UPDATE to UE_A UPDATE IMS_A forwards UPDATE with 200 OK indicating attribute "recvonly" inactive 200 OK IMS_A forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IMS_B 200 OK IBCF_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A	49B								—			User B puts call on hold
UPDATE IBCF_A forwards UPDATE to IBCF_B UPDATE IBCF_B forwards UPDATE to IMS_B UPDATE IBCF_B forwards UPDATE to IBCF_B UPDATE IBCF_B forwards UPDATE to IBCF_A UPDATE IBCF_A forwards UPDATE to IBCF_A UPDATE IBCF_A forwards UPDATE to IMS_A UPDATE IMS_A forwards UPDATE to UE_A UPDATE IMS_A forwards UPDATE to UE_A UPDATE IMS_A forwards UPDATE with 200 OK indicating attribute "recvonly" inactive 200 OK IMS_A forwards 200 OK response to IBCF_A 200 OK IBCF_A forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A	50B										UPDATE	
UPDATE IBCF_B forwards UPDATE to IMS_B UPDATE IMS_B forwards UPDATE to IBCF_B UPDATE IBCF_B forwards UPDATE to IBCF_A UPDATE IBCF_A forwards UPDATE to IMS_A UPDATE IBCF_A forwards UPDATE to IMS_A UPDATE IMS_A forwards UPDATE to UE_A USER A is informed that call is on hold USER A is informed that call is on hold UPDATE IMS_A forwards UPDATE with 200 OK indicating attribute "recvonly" inactive 200 OK IMS_A forwards 200 OK response to IBCF_A 200 OK IBCF_A forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A	51B					→					UPDATE	IMS_A forwards UPDATE to IBCF_A
UPDATE IMS_B forwards UPDATE to IBCF_B UPDATE IBCF_B forwards UPDATE to IBCF_A UPDATE IBCF_A forwards UPDATE to IMS_A UPDATE IMS_A forwards UPDATE to IMS_A UPDATE IMS_A forwards UPDATE to UE_A UPDATE IMS_A forwards UPDATE to UE_A UPDATE IMS_A forwards UPDATE to UE_A UPDATE IMS_A forwards UPDATE with 200 OK indicating attribute "recvonly" inactive 200 OK IMS_A forwards 200 OK response to IBCF_A 200 OK IBCF_A forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_A forwards 200 OK response to IBCF_A	52B						\rightarrow				UPDATE	IBCF_A forwards UPDATE to IBCF_B
UPDATE IBCF_B forwards UPDATE to IBCF_A UPDATE IBCF_A forwards UPDATE to IMS_A UPDATE IMS_A forwards UPDATE to UE_A UPDATE IMS_A forwards UPDATE to UE_A UPDATE IMS_A forwards UPDATE to UE_A USER A is informed that call is on hold 200 OK UE_A responds to UPDATE with 200 OK indicating attribute "recvonly" inactive 200 OK IMS_A forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IMS_B 200 OK IMS_B forwards 200 OK response to IBCF_B 200 OK IMS_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A	53B							\rightarrow			UPDATE	IBCF_B forwards UPDATE to IMS_B
56B 57B 57B 58B UPDATE IBCF_A forwards UPDATE to IMS_A UPDATE IMS_A forwards UPDATE to UE_A User A is informed that call is on hold User A is informed that call is on hold USER A responds to UPDATE with 200 OK indicating attribute "recvonly" inactive 200 OK IMS_A forwards 200 OK response to IBCF_A 200 OK IBCF_A forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IMS_B 200 OK IBCF_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A	54B						—				UPDATE	IMS_B forwards UPDATE to IBCF_B
57B UPDATE IMS_A forwards UPDATE to UE_A User A is informed that call is on hold 200 OK UE_A responds to UPDATE with 200 OK indicating attribute "recvonly" inactive 200 OK IMS_A forwards 200 OK response to IBCF_A 200 OK IBCF_A forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A	55B					—	_				UPDATE	IBCF_B forwards UPDATE to IBCF_A
58B User A is informed that call is on hold 200 OK UE_A responds to UPDATE with 200 OK indicating attribute "recvonly" inactive 200 OK IMS_A forwards 200 OK response to IBCF_A 200 OK IBCF_A forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IMS_B 200 OK IMS_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A	56B					_					UPDATE	IBCF_A forwards UPDATE to IMS_A
59B 60B 60B 61B 62B 63B 64B 65B	57B										UPDATE	IMS_A forwards UPDATE to UE_A
indicating attribute "recvonly" inactive 200 OK IMS_A forwards 200 OK response to IBCF_A 200 OK IBCF_A forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IMS_B 200 OK IMS_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_B forwards 200 OK response to IBCF_A	58B	—										User A is informed that call is on hold
60B 61B 62B 63B 64B 65B 60B 200 OK IMS_A forwards 200 OK response to IBCF_A 200 OK IBCF_A forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_B 200 OK IMS_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_A forwards 200 OK response to IBCF_A 200 OK IBCF_A forwards 200 OK response to IBCF_A	59B			→							200 OK	
62B 63B 63B 64B 65B 200 OK IBCF_B forwards 200 OK response to IMS_B 200 OK IMS_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_A forwards 200 OK response to IMS_A	60B				_	→					200 OK	· ·
63B 64B 65B 200 OK IMS_B forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_A forwards 200 OK response to IMS_A	61B						\rightarrow				200 OK	IBCF_A forwards 200 OK response to IBCF_B
64B 64B 200 OK IBCF_B forwards 200 OK response to IBCF_A 200 OK IBCF_A forwards 200 OK response to IMS_A	62B							\rightarrow			200 OK	IBCF_B forwards 200 OK response to IMS_B
65B 200 OK IBCF_A forwards 200 OK response to IMS_A	63B						—	_			200 OK	IMS_B forwards 200 OK response to IBCF_B
	64B					←	_				200 OK	IBCF_B forwards 200 OK response to IBCF_A
66B 200 OK IMS_A forwards 200 OK response to UE_B	65B					_					200 OK	IBCF_A forwards 200 OK response to IMS_A
	66B					_			\rightarrow		200 OK	IMS_A forwards 200 OK response to UE_B

Step					ection	1				Message	Comment
	U s e r	U E A	I M S A	MСZM	– вс ғ	- вс ғ	- М о в	U E B	U s e r		
	Α			DB	A	В			В		
67B									\rightarrow		User B is informed that call is on hold
68B								—			User B resumes call
69B			\leftarrow							UPDATE	UE_A sends UPDATE message indicating media attribute "sendrecv" (Call Resume)
70B				_	\rightarrow					UPDATE	IMS_A forwards UPDATE to IBCF_A
71B						\rightarrow				UPDATE	IBCF_A forwards UPDATE to IBCF_B
72B							\rightarrow			UPDATE	IBCF_B forwards UPDATE to IMS_B
73B						—				UPDATE	IMS_B forwards UPDATE to IBCF_B
74B					←	_				UPDATE	IBCF_B forwards UPDATE to IBCF_A
75B			←		_					UPDATE	IBCF_A forwards UPDATE to IMS_A
76B		←								UPDATE	IMS_A forwards UPDATE to UE_A
77B	-										User A is informed that call is resumed
78B			\rightarrow							200 OK	UE_A responds to UPDATE with 200 OK indicating media attribute "sendrecv"
79B					\rightarrow					200 OK	IMS_A forwards 200 OK response to IBCF_A
80B						\rightarrow				200 OK	IBCF_A forwards 200 OK response to IBCF_B
81B							\rightarrow			200 OK	IBCF_B forwards 200 OK response to IMS_B
82B						—				200 OK	IMS_B forwards 200 OK response to IBCF_B
83B					—					200 OK	IBCF_B forwards 200 OK response to IBCF_A
84B			\leftarrow							200 OK	IBCF_A forwards 200 OK response to IMS_A
85B								\rightarrow		200 OK	IMS_A forwards the 200 OK response to UE_B
86B											User B is informed that call is resumed

4.5.3.1.3 Subsequent Request Procedures - Originating Network

4.5.3.1.3.1 Call CANCEL by calling user

		Interoperability Test Desc	ription								
Identifier:	TD_IMS_0	CALL_0014	•								
Summary:	IMS netwo	ork handles correctly calling user	cancelling call before its establishment								
Configuration:	CF_INT_C		•								
SUT:	IMS_A										
References:	Test Purp	oose	Specification Reference								
	TP_IMS_5	5107_03	TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 8 th numbered list)								
Use Case ref.:	UC_02_I										
Pre-test conditions:	UE_Aper clUE_A	of IMS_A and of IMS B is configur A and UE_B have IP bearers establause 4.2.1 A is registered in IMS_A using any B is registered in IMS_B using any	olished to their respective IMS networks as								
Took Common on	Cton										
Test Sequence:	Step	User A calls User B									
	2		incoming call of Llagr A								
	3	Verify that user B is informed of it. Verify that user A is informed that									
	4	User A cancels call									
	5	Verify that user B is informed that	at call has been cancelled								
	6	Verify that user A is informed that									
		Verify that user A is informed the	it can is terminated								
Conformance	Check										
Criteria:	1	TP_IMS_5107_03 in CFW step 2	26 (CANCEL):								
		ensure that {	(-· ·· -)·								
	when { UE_A sends CANCEL to UE_B }										
		then { IMS_B receives the CAN	ICEL								
		not containing Route_i									
		indicating the S-CSCF	SIP_URI of IMS_A								

Step				C	irectio	n				Message	Comment
	U s e r A	U E A	I M S A	E N U M DB	I B C F A	I B C F B	I M S B	U E B	U s e r B		
1		\rightarrow									User A calls User B
2			\rightarrow							INVITE	UE_A sends INVITE with the first SDP offer indicating all desired medias and codecs that
3		←								100 Trying	IMS_A responds with a 100 Trying provisional response
4			_	\rightarrow						ENUM	IMS_A sends query to ENUM DB
5			\leftarrow	_						ENUM	ENUM DB sends response to IMS_A
6					\longrightarrow					INVITE	IMS_A forwards INVITE to IBCF_A
7			\leftarrow	_ -						100 Trying	IBCF_A responds with a 100 Trying provisional response
8						\longrightarrow				INVITE	IBCF_A forwards INVITE to IBCF_B
9					\leftarrow					100 Trying	IBCF_B responds with a 100 Trying provisional response
10						_	\longrightarrow			INVITE	IBCF_B forwards INVITE to IMS_B

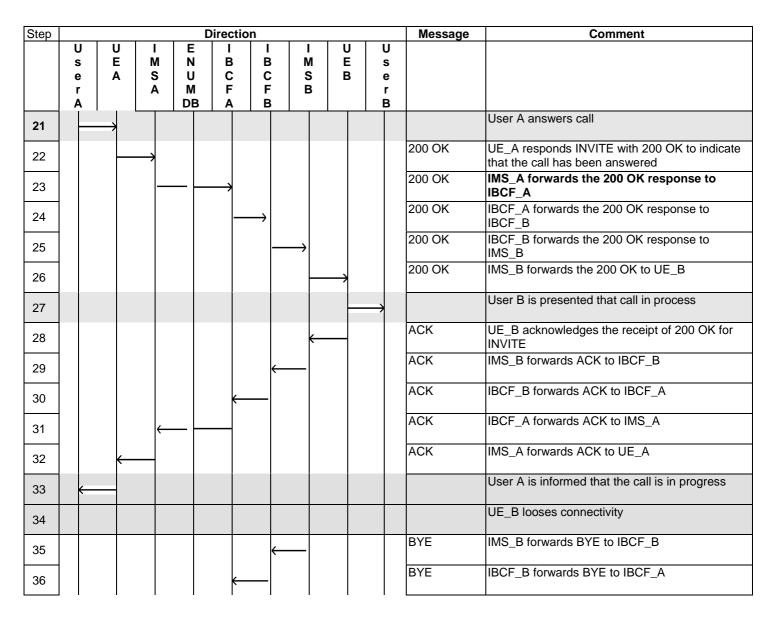
Step				Direct	ion			Message	Comment
-		U I E N	I E	I B	I B	I M	U U E s		
	е	A S	S U	С	С	S	Ве		
	r A	A	M DE		F B	В	r B		
11	·				←	_		100 Trying	IMS_B responds with a 100 Trying provisional response
12							\rightarrow	INVITE	IMS_B forwards INVITE to UE_B
13								100 Trying	UE_B optionally responds with a 100 Trying provisional response
14									User B is informed of incoming call of User A
15						-		180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting
16					←			180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
17				(<u> </u>			180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
18			←					180 Ringing	IBCF_A IBCF_A forwards 180 Ringing response to IMS_A
19								180 Ringing	IMS_A forwards the 180 Ringing response to UE_A
20	—								User A is informed that UE_B is ringing
21									User A cancels the call
22								CANCEL	UE_A sends a CANCEL to IMS_A
23		.						200 OK	IMS_A responds with a 200 OK to UE_A
24				\longrightarrow				CANCEL	IMS_A forwards the CANCEL to IBCF_A
25			←					200 OK	IBCF_A responds with a 200 OK to IMS_A
26				_	\longrightarrow			CANCEL	IBCF_A forwards the CANCEL to IBCF_B
27				•				200 OK	IBCF_B responds with a 200 OK to IBCF_A
28						\rightarrow		CANCEL	IBCF_B forwards the CANCEL to IMS_B
29					←	_		200 OK	IMS_B responds with a 200 OK to IBCF_B
30							\rightarrow	CANCEL	IMS_B forwards the CANCEL to UE_B
31								200 OK	UE_B responds with a 200 OK to IMS_B
32									User B is informed that call has been cancelled
33						-		487 Request Terminated	UE_B sends 487 Request Terminated to IMS_B
34							\rightarrow	ACK	IMS_B responds with ACK to UE_B
35					←	_		487 Request Terminated	IMS_B forwards the 487 Request Terminated to IBCF_B
36						\rightarrow		ACK	IBCF_B responds with ACK to IMS_B
37				+				487 Request Terminated	IBCF_B forwards the 487 Request Terminated to IBCF_A
38				-	\longrightarrow			ACK	IBCF_A responds with ACK to IBCF_B
	I	1 1	1	ı	I	1	1 1	<u>L</u>	

Step		Direction										Comment
	U s e r A	U E A	M S A	E N U M DB	I B C F A	I B C F B	M S B	E	É	U s e r B		
39			←			·		•			487 Request Terminated	IBCF_A forwards the 487 Request Terminated to IMS_A
40					\longrightarrow						ACK	IMS_A responds with ACK to IBCF_A
41		\leftarrow										IMS_A forwards the 487 Request Terminated to UE_A
42			\longrightarrow								ACK	UE_A responds with ACK to IMS_A
43	←											User A is informed that call is terminated

4.5.3.1.3.2 Call CANCEL due to loss of connectivity of calling user during call

		Interoperability Test Des	cription						
Identifier:	TD_IMS_	CALL_0015							
Summary:	IMS netwo	ork ends call in case calling UE lo	rk ends call in case calling UE looses connectivity during a call						
Configuration:	CF_INT_CALL CF_INT_CALL								
SUT:	IMS_B								
References:	Test Purp	oose	Specification Reference						
	TP_IMS_	5073_01	TS 124 229 [1], clause 5.2.8.1.2 ¶1 (item 1 in 1 st numbered list)						
Use Case ref.:	UC_02_I								
Pre-test conditions:	ured according to table 1 ablished to their respective IMS networks as y user identity y user identity or PCRF like functionality								
Test Sequence:	3 4 5 6 7	User B calls User A Verify that user A is informed of Verify that user B is informed th User A answers call Verify that user B is presented t Verify that user A is informed th UE_B looses connectivity Verify that user A is informed th	at UE_A is ringing hat call in process at the call is in progress						

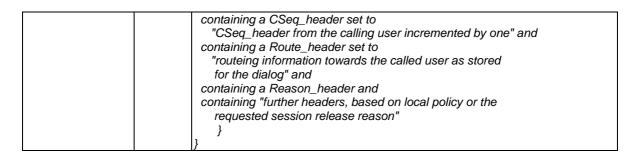
	Interoperability Test Description							
Conformance	Check							
Criteria:	1	TP_IMS_5073_01 in CFW step 36 (BYE):						
		ensure that {						
		when { IMS_B receives "an indication that UE_B is no_longer_available" }						
		then { IMS_B sends a BYE to IMS_A						
		containing Request_URI						
		indicating the Contact_header_value of UE_A and						
		containing To_header						
		indicating the initial 200_OK_To_value from UE_A						
		containing From_header						
		indicating the initial INVITE_From_value from UE_B and						
		containing Call-ID_header						
		indicating the initial INVITE_Call_Id_value from UE_B and containing CSeg_header						
		indicating an incremented Sequence_Number and						
		containing Route header						
		indicating "dialog specific routing information for UE_A" and						
		containing Reason_header						
		indicating "503 Service Unavailable" and						
		containing						
		"further headers based on local policy or call release reason"						
		}						
		}						

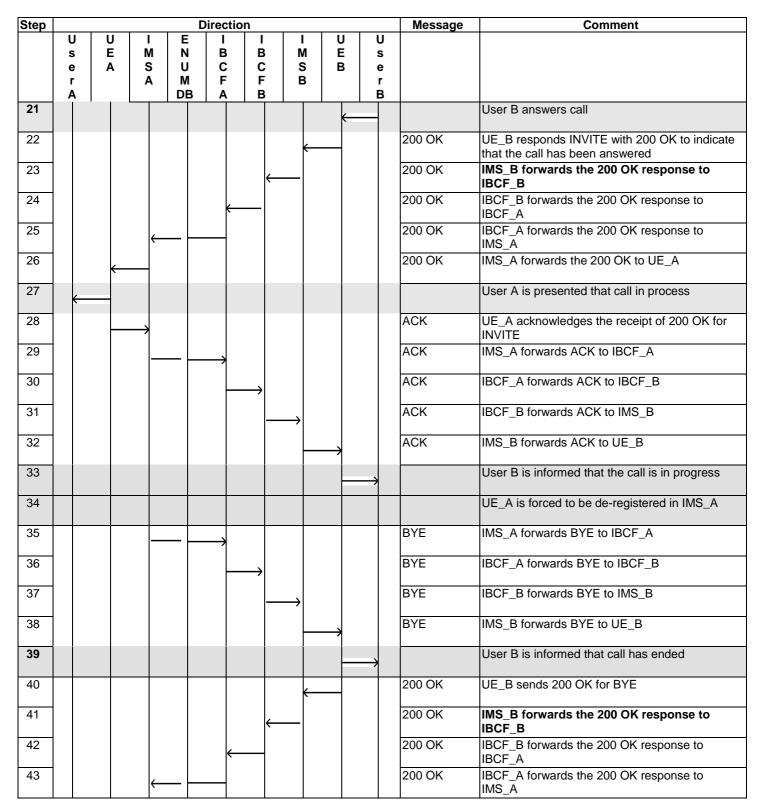


Step				D	irectio	n			Message	Comment	
	D » e r A	U E A	M S A	E N U M DB	I B C F A	I B C F B	M S B	UEB	U s e r B		
37			\leftarrow	_						BYE	IBCF_A forwards BYE to IMS_A
38		\leftarrow								BYE	IMS_A forwards BYE to UE_A
39	←										User A is informed that call has ended
40			\rightarrow							200 OK	UE_A sends 200 OK for BYE
41				_	\rightarrow					200 OK	IMS_A forwards the 200 OK response to IBCF_A
42						\rightarrow				200 OK	IBCF_A forwards the 200 OK response to IBCF_B
43							\longrightarrow			200 OK	IBCF_B forwards the 200 OK response to IMS_B

4.5.3.1.3.3 Call failure due to de-registration of calling user during call

		lutava navability Taa	4 Decembries					
Identifier:	TD IME	Interoperability Tes	Description					
Identifier: TD_IMS_CALL_0016 Summary: IMS network ends call in case calling UE is forcefully de-registered in IMS network								
Summary.	a call	ork ends call in case calling	DE IS forcefully de-registered in livio hetwork during					
Configuration:	CF_INT_	CALL						
SUT:								
	IMS_A Test Purpose Specification Reference							
References:			Specification Reference					
	TP_IMS_	5139_01	TS 124 229 [1], clause 5.4.5.1.2 ¶1 (item 1 and 2 in 1 st numbered list)					
			(item 1 and 2 in 1 numbered list)					
Use Case ref.:	UC_02_I							
D	1100							
Pre-test			onfigured according to table 1					
conditions:			established to their respective IMS networks as					
		clause 4.2.1						
	UE_A is registered in IMS_A using any user identity							
	UE_B is registered in IMS_B using any user identity							
	There is an ongoing dialogue between UE_A and UE_B							
Test Sequence:	Step							
	1	User A calls User B						
	2	Verify that user B is informed	ed of incoming call of User A					
	3	Verify that user A is informed	ed that UE_B is ringing					
	4	User B answers call						
	5	Verify that User A is inform	ed that call has been answered					
	6							
	7	UE_A is forced to be de-re-						
	8 Verify that user B is informed that call has been ended							
		Volley that door B to inform	ou that can had been ended					
Conformance	Check							
Criteria:	1	TP_IMS_5139_01 in CFW	step 34 (BYE):					
		ensure that {						
			network internal indication that the lifetime					
			dentity has expired"}					
		then { IMS_A sends a BYE						
			I set to Contact_header_value of UE_B and					
		containing a To_header s						
			00_response to initial INVITE and					
		containing a From_heade						
		the From_header of the						
		containing a Call-ID_head						
		the Call-ID header of th						

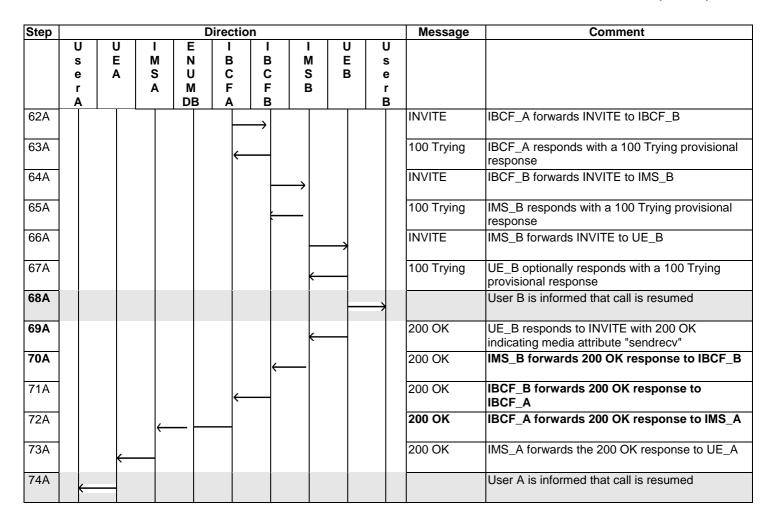




4.5.3.1.3.4 Subsequent target refresh request (INVITE)

		Interoperability Test Descr	ription					
Identifier:	TD_IMS_CALL_0017							
Summary:	IMS network handles subsequent INVITEs correctly in case of a user initiated call hold and resume when home caller puts another home user on hold and resumes call							
	and resun	ne when home caller puts another	home user on hold and resumes call					
Configuration:	CF_INT_0	2411						
SUT:	IMS_A	DALL						
References:	Test Purp	2050	Specification Reference					
Notoronocs.	TP_IMS_5		TS 124 229 [1], clause 5.4.3.2 ¶108					
		5100 <u>-</u> 01	(6 th numbered list)					
	TP_IMS_5	5121_02	TS 124 229 [1], clause 5.4.3.3 ¶123					
		_	(9 th numbered list)					
Use Case ref.:	UC_03_I							
	1							
Pre-test		of IMS_A and of IMS B is configur						
conditions:			lished to their respective IMS networks as					
		ause 4.2.1	ad baddon suga a vaiga a INIVITE					
		A configured to perform user initiate						
		A is registered in IMS_A using any B is registered in IMS_B using any						
	J• UE_E	s is registered in livio_b dsirig arry	user identity					
Test Sequence:	Step							
	1	User A calls User B						
	2	Verify that user B is informed of in	ncoming call of User A					
	3	Verify that user A is informed that	t UE_A is ringing					
	4	User B answers call						
	5	Verify that user A is informed that call has been answered						
	6	Verify that user B is informed that call is established						
	7	User A puts call on hold Verify that user B is informed that call is on hold						
	8 9	Verify that user A is informed that call is on hold						
	10	User A resumes call	t call is off floid					
	11	Verify that user B is informed that call is resumed						
	12	Verify that user A is informed that call is resumed						
	13	User A ends call Verify that user B is informed that call has ended						
	14							
	15	Verify that user A is informed that	hat user A is informed that call has ended					
•								
Conformance	Check							
Criteria:	1	TP_IMS_5106_01 in CFW step 3	201/201/201/201/201/201/201/201/201/201/					
	·	ensure that {	SAA AIIU OZA (IIVVITE).					
		when { UE_A sends a subseque	ent INVITE to UE_B }					
		then { IMS_B receives the subs						
		containing a Reco						
			CSCF_SIP_URI of IMS_A and					
		containing a Route						
			e S-CSCF_SIP_URI of IMS_A and arging-Vector_header					
			n access-network-charging-info_parameter					
		}	raccode network onarging imo_parameter					
		}						
	2	TP_IMS_5121_02 (IMS_B) in CF	W step 48A and 71A (200 OK):					
		ensure that {						
		when { UE_B sends a 2xx_resp						
		then { IMS_A receives the 2xx_						
		containing a P-Charging-	· vector_neader s-network-charging-info_parameter }					
			3 Notwork-ondrying-inio_parameter /					
		17						

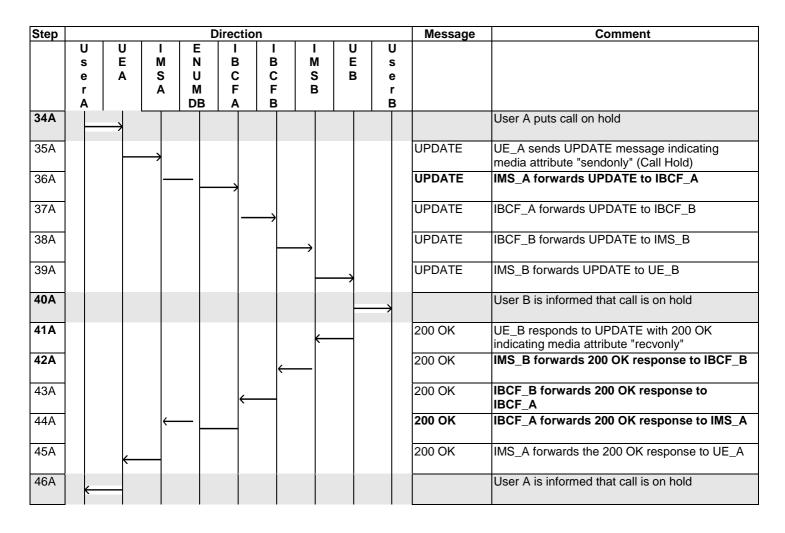
Step			Dir	ection					Message	Comment
	U U s E	I M	E N	I I B B	I B N			J s		
	e A	S	U	C	S	; I	В	е		
	r A	A	M DB	F F		•		r 3		
34A										User A puts call on hold
35A	-								INVITE	UE_A sends reINVITE message indicating media attribute "sendonly" (Call Hold)
36A	(100 Trying	IMS_A responds with a 100 Trying provisional response
37A				\rightarrow					INVITE	IMS_A forwards INVITE to IBCF_A
38A		←							100 Trying	IBCF_A responds with a 100 Trying provisional response
39A				\longrightarrow	,				INVITE	IBCF_A forwards INVITE to IBCF_B
40A					-				100 Trying	IBCF_A responds with a 100 Trying provisional response
41A					\longrightarrow				INVITE	IBCF_B forwards INVITE to IMS_B
42A					←—				100 Trying	IMS_B responds with a 100 Trying provisional response
43A							>		INVITE	IMS_B forwards INVITE to UE_B
44A						(100 Trying	UE_B optionally responds with a 100 Trying provisional response
45A							\longrightarrow			User B is informed that call is on hold
46A							-		200 OK	UE_B responds to INVITE with 200 OK indicating media attribute "recvonly"
47A									200 OK	IMS_B forwards 200 OK response to IBCF_B
48A					-				200 OK	IBCF_B forwards 200 OK response to IBCF_A
49A		\leftarrow		_					200 OK	IBCF_A forwards 200 OK response to IMS_A
50A	←								200 OK	IMS_A forwards the 200 OK response to UE_A
51A	├									User A is informed that call is on hold
52A	-	→							ACK	UE_A acknowledges the receipt of 200 OK for INVITE
53A				\rightarrow					ACK	IMS_A forwards ACK to IBCF_A
54A				\longrightarrow					ACK	IBCF_A forwards ACK to IBCF_B
55A					\longrightarrow				ACK	IBCF_B forwards ACK to IMS_B
56A									ACK	IMS_B forwards ACK to UE_B
57A	—									User A resumes call
58A									INVITE	UE_A sends reINVITE message indicating media attribute "sendrecv" (Call Resume)
59A	│								100 Trying	IMS_A responds with a 100 Trying provisional response
60A		-		\rightarrow					INVITE	IMS_A forwards INVITE to IBCF_A
61A		\leftarrow		\perp					100 Trying	IBCF_A responds with a 100 Trying provisional response

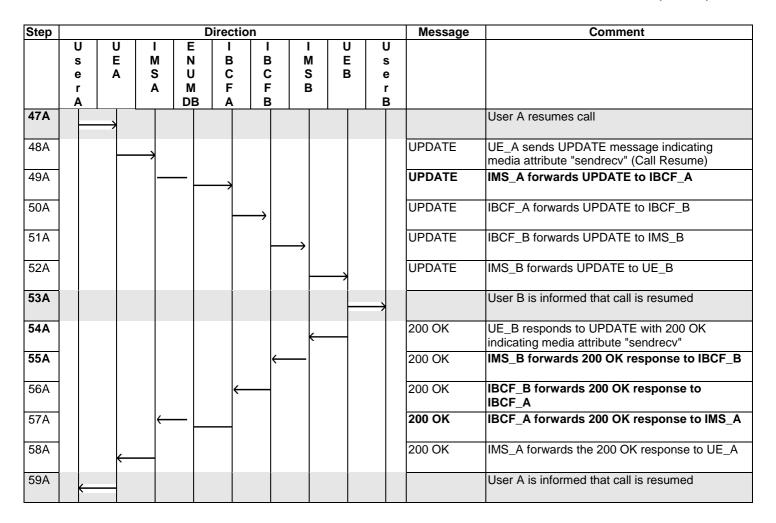


4.5.3.1.3.5 Subsequent target refresh request (UPDATE)

		Interoperability Test	Description							
Identifier:	TD_IMS_	CALL_0018								
Summary:		network handles subsequent UPDATEs correctly in case of a user initiated call								
		esume when home caller puts another home user on hold and resumes call								
Configuration:	CF_INT_0									
SUT:	IMS_A, IN	/IS_B								
References:	Test Purp	oose	Specification Reference							
	TP_IMS_	5106_02	TS 124 229 [1], clause 5.4.3.2 ¶108							
			(6 th numbered list)							
	TP_IMS_	5121_02	TS 124 229 [1], clause 5.4.3.3 ¶123							
			(9 th numbered list)							
Use Case ref.:	UC_03_I		·							
Pre-test	HSS	of IMS_A and of IMS B is co	nfigured according to table 1							
conditions:	UE_A and UE_B have IP bearers established to their respective IMS networks as									
		lause 4.2.1	'							
			initiated hold/resume using UPDATE							
		A is registered in IMS_A using								
		B is registered in IMS_B using								
	0	<u></u> _ us	g diriy deer ideriniy							
Test Sequence:	Step									
	1	User A calls User B								
	2	Verify that user B is informe	ed of incoming call of User A							
	3	Verify that user A is informed	•							
	4	User B answers call								
	5	Verify that user A is informed	ed that call has been answered							
	6	Verify that user B is informe								
	7 User A puts call on hold									

		Interoperability Test Description				
	8	Verify that user B is informed that call is on hold				
	9	Verify that user A is informed that call is on hold				
	10	User A resumes call				
	11	Verify that user B is informed that call is resumed				
	12	Verify that user A is informed that call is resumed				
	13	User A ends call				
	14	Verify that user B is informed that call has ended				
	15	Verify that user A is informed that call has ended				
Conformance	Check					
Criteria:	2	TP_IMS_5106_02 (IMS_A) in CFW step 37A and 50A (UPDATE): ensure that { when { UE_A sends an UPDATE to UE_B } then { IMS_B receives the UPDATE				
		containing a P-Charging-Vector_header not containing a access-network-charging-info_parameter } }				

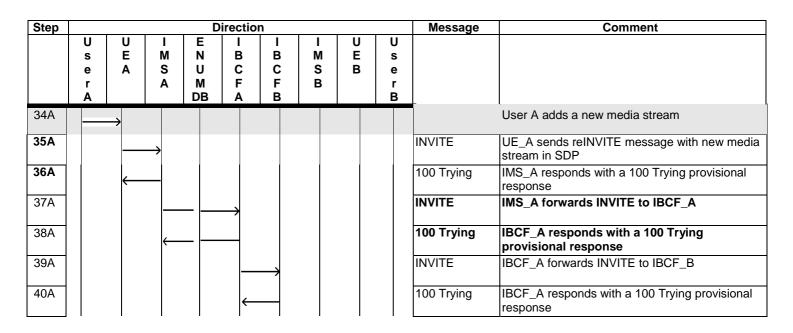




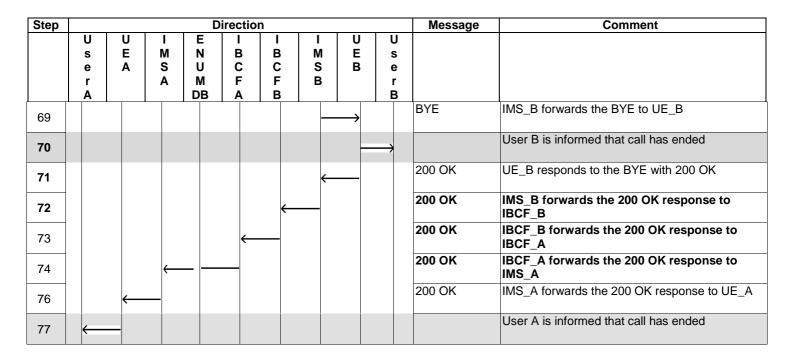
4.5.3.1.3.6 Addition of media streams (reINVITE)

	Interoperability Te	est Description					
Identifier:	TD_IMS_CALL_0019						
Summary:	IMS network handles subsequent INVITEs correctly when adding new media stream.						
Configuration:	CF_INT_CALL						
SUT:	IMS_A						
References:	Test Purpose	Specification Reference					
	TP_IMS_5106_01	TS 124 229 [1], clause 5.4.3.2 ¶108 (6 th numbered list)					
	TP_IMS_5121_01	TS 124 229 [1], clause 5.4.3.3 ¶123 (9 th numbered list)					
	TP_IMS_5121_02	TS 124 229 [1], clause 5.4.3.3 ¶123 (9 th numbered list)					
Use Case ref.:	UC_13						
Pre-test conditions:	 UE_A and UE_B have IP bear per clause 4.2.1 	• •					

		Interoperability Test Description
Test Sequence:	Step	interoperating root pooringtion
	1	User A calls User B (IMS VoIP call)
	2	Verify that User B is informed of incoming call of User A
	3	Verify that User A is informed that UE_A is ringing
	4	User B answers the call
	5	Verify that User A is informed that call has been answered
	6	Verify that User B is informed that call is established
	7	User A adds a new media stream
	8	Verify that User B is informed to accept new media stream (optional)
	9	Verify that User A is informed to accept new media stream (optional)
	10	If informed, User B accepts the new media stream
	11	Verify that User A is informed that new media stream has been accepted
	12	User A releases the call
	13	Verify that user B is informed that call has ended
	14	Verify that user A is informed that call has ended
Conformance Criteria:	Check	
	1	TP_IMS_5106_01 in CFW step 39A:
		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 a access-network-charging-info_parameter }
]
	2	TP_IMS_5121_01 in CFW step 40A, 48A (180 ringing):
		ensure that {
		when { UE_B sends a 1xx response to UE_A }
		then { IMS_A receives the 1xx response
		containing a P-Charging-Vector_header
		<pre>not containing a access-network-charging-info_parameter } }</pre>
	3	TP_IMS_5121_02 in CFW step 55A, 73 (200 OK):
	1	ensure that {
		when { UE_B sends a 2xx_response to UE_A }
	1	then { IMS_A receives the 2xx_response
	1	containing a P-Charging-Vector_header
		not containing a access-network-charging-info_parameter }
i		}



Step				Dire	ction			l N	Message	Comment
	U s e r	Α	M S A	U M	C (I I B M C S B	B B	J s e r		
41A	A		[DB	<u>A </u>	B		3 IN√	/ITE	IBCF_B forwards INVITE to IMS_B
42A						←—		100) Trying	IMS_B responds with a 100 Trying provisional response
43A						_	→	INV	/ITE	IMS_B forwards INVITE to UE_B
44A						←		100) Trying	UE_B optionally responds with a 100 Trying provisional response
45A							\longmapsto			Verify that User B is informed to accept/reject new media stream (optional)
46A						←		180	Ringing	UE_B responds to reINVITE with 180 Ringing
47A								180) Ringing	IMS_B forwards 180 Ringing response to IBCF_B
48A						-		180) Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
49A			←—		-			180	Ringing	IBCF_A forwards 180 Ringing response to IMS_A
50A								180	Ringing	IMS_A forwards the 180 Ringing response to UE_A
51A	←									Verify that User A is informed that UE_B is alerting User B (optional)
52A							(If informed, User B accepts the new media stream
53A						←		200) OK	UE_B responds with 200 OK to reINVITE
54A								200) OK	IMS_B forwards 200 OK response to IBCF_B
55A					\leftarrow	-		200	OK	IBCF_B forwards 200 OK response to IBCF_A
56A			\longleftarrow		-			200	OK	IBCF_A forwards 200 OK response to IMS_A
57A								200) OK	IMS_A forwards the 200 OK response to UE_A
58A	←									User A is informed that new media stream has been accepted
59A								AC	K	UE_A acknowledges the receipt of 200 OK for INVITE
60A					>			AC		IMS_A forwards ACK to IBCF_A
61A						>		AC	K	IBCF_A forwards ACK to IBCF_B
62						\longrightarrow		AC	K	IBCF_B forwards ACK to IMS_B
63							-	AC	K	IMS_B forwards ACK to UE_B
64		>						BY	E	User A releases the call
65								BY		UE_A sends BYE to indicate that the call has ended
66					>			BY	E	IMS_A forwards the BYE to IBCF_A
67						>		BY	E	IBCF_A forwards the BYE to IBCF_B
68								BY	E	IBCF_B forwards the BYE to IMS_B



4.5.3.1.3.7 Modification of an existing media stream (reINVITE)

Interoperability T	est Description					
TD_IMS_CALL_0020						
IMS network handles subsequent INVITEs and UPDATEs correctly during modification of an existing media stream.						
CF_INT_CALL						
IMS_A						
Test Purpose	Specification Reference					
TP_IMS_5106_01	TS 124 229 [1], clause 5.4.3.2 ¶108 (6 th numbered list)					
TP_IMS_5121_01	TS 124 229 [1], clause 5.4.3.3 ¶123 (9 th numbered list)					
TP_IMS_5121_02	TS 124 229 [1], clause 5.4.3.3 ¶123 (9 th numbered list)					
UC_13						
 UE_A and UE_B have IP beat per clause 4.2.1 UE_A and UE_B support multand support RTP and MSRP UE_A is registered in IMS_A 						
	IMS network handles subsequent of an existing media stream. CF_INT_CALL IMS_A Test Purpose TP_IMS_5106_01 TP_IMS_5121_01 TP_IMS_5121_02 UC_13 • HSS of IMS_A and of IMS B is upport multiple of the per clause 4.2.1 • UE_A and UE_B support multiple and support RTP and MSRP					

		Interoperability Test Description
Test Sequence:	Step	
	1	User A calls User B (IMS VoIP call)
	2	Verify that user B is informed of incoming call of User A
	3	Verify that user A is informed that UE_B is ringing
	4	User B answers the call
	5	Verify that user A is informed that call has been answered
	6	Verify that user B is informed that call is established
	7	User A adds a new media stream
	8	Verify that User B is informed to accept/reject new media stream (optional)
	9	Verify that User A is informed that UE_B is alerting User B (optional)
	10	If informed, verify that User B accepts the new media stream
	11	Verify that User A is informed that new media stream has been accepted
		(optional)
	12	User A modifies the media stream
	13	Verify that User B is informed to accept/reject media stream modification
		(optional)
	14	Verify that User A is informed that UE_B is alerting User B (optional)
	15	If informed, verify that User B accepts the media stream modification
	16	Verify that User A is informed that media stream modification has been
		accepted (optional)
	17	User B releases the call
	18	Verify that user A is informed that the call has ended
	19	Verify that user B is informed that call has ended
Conformance	Check	
Criteria:		
	1	TP_IMS_5106_01 in CFW step 39A and 697A (reINVITE):
	1	ensure that {
	1	ensure that { when { UE_A sends a subsequent INVITE to UE_B }
	1	ensure that { when { UE_A sends a subsequent INVITE to UE_B } then { IMS_B receives the subsequent INVITE
	1	ensure that { when { UE_A sends a subsequent INVITE to UE_B } then { IMS_B receives the subsequent INVITE containing a Record-Route_header
	1	ensure that { when { UE_A sends a subsequent INVITE to UE_B } then { IMS_B receives the subsequent INVITE
	1	ensure that { when { UE_A sends a subsequent INVITE to UE_B } then { IMS_B receives the subsequent INVITE
	1	ensure that { when { UE_A sends a subsequent INVITE to UE_B } then { IMS_B receives the subsequent INVITE
	1	ensure that { when { UE_A sends a subsequent INVITE to UE_B } then { IMS_B receives the subsequent INVITE
	1	ensure that { when { UE_A sends a subsequent INVITE to UE_B } then { IMS_B receives the subsequent INVITE
2		ensure that { when { UE_A sends a subsequent INVITE to UE_B } then { IMS_B receives the subsequent INVITE
	2	ensure that { when { UE_A sends a subsequent INVITE to UE_B } then { IMS_B receives the subsequent INVITE
		ensure that { when { UE_A sends a subsequent INVITE to UE_B } then { IMS_B receives the subsequent INVITE
		ensure that { when { UE_A sends a subsequent INVITE to UE_B } then { IMS_B receives the subsequent INVITE
		ensure that { when { UE_A sends a subsequent INVITE to UE_B } then { IMS_B receives the subsequent INVITE
		ensure that { when { UE_A sends a subsequent INVITE to UE_B } then { IMS_B receives the subsequent INVITE
		ensure that { when { UE_A sends a subsequent INVITE to UE_B } then { IMS_B receives the subsequent INVITE
		ensure that { when { UE_A sends a subsequent INVITE to UE_B } then { IMS_B receives the subsequent INVITE
		ensure that { when { UE_A sends a subsequent INVITE to UE_B } then { IMS_B receives the subsequent INVITE
	2	ensure that { when { UE_A sends a subsequent INVITE to UE_B } then { IMS_B receives the subsequent INVITE
	2	ensure that { when { UE_A sends a subsequent INVITE to UE_B } then { IMS_B receives the subsequent INVITE
	2	ensure that { when { UE_A sends a subsequent INVITE to UE_B } then { IMS_B receives the subsequent INVITE
	2	ensure that { when { UE_A sends a subsequent INVITE to UE_B } then { IMS_B receives the subsequent INVITE
	2	ensure that { when { UE_A sends a subsequent INVITE to UE_B } then { IMS_B receives the subsequent INVITE

Step			Direc	tion				Message	Comment
	U U s E	M I	E I N B		I M	U	U s		
	e A r	A	U C M F	F	S B	В	e r		
34A	A	D	B A	В			В		
35A									User A adds a new media stream UE_A sends reINVITE message with new
36A		→						INVITE	media stream in SDP
	├	_						100 Trying	IMS_A responds with a 100 Trying provisional response
37A			\longrightarrow					INVITE	IMS_A forwards INVITE to IBCF_A
38A								100 Trying	IBCF_A responds with a 100 Trying provisional response
39A								INVITE	IBCF_A forwards INVITE to IBCF_B
40A								100 Trying	IBCF_A responds with a 100 Trying provisional response
41A				-	\longrightarrow			INVITE	IBCF_B forwards INVITE to IMS_B
42A				•				100 Trying	IMS_B responds with a 100 Trying provisional response
43A					_	\longrightarrow		INVITE	IMS_B forwards INVITE to UE_B
44A					(100 Trying	UE_B optionally responds with a 100 Trying provisional response
45A						-	\longrightarrow		Verify that User B is informed to accept/reject new media stream (optional)
46A					←			180 Ringing	UE_B responds to reINVITE with 180 Ringing
47A				€				180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
48A								180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
49A								180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
50A	←	_						180 Ringing	IMS_A forwards the 180 Ringing response to UE_A
51A	<u> </u>								Verify that User A is informed that UE_B is alerting User B (optional)
52A						+			If informed, User B accepts the new media stream
53A					(200 OK	UE_B responds with 200 OK to reINVITE
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 the 200 OK response to UE_A
58A	←—								User A is informed that new media stream has been accepted
59A		\rightarrow						ACK	UE_A acknowledges the receipt of 200 OK for INVITE
60A			\longrightarrow					ACK	IMS_A forwards ACK to IBCF_A
61A				─				ACK	IBCF_A forwards ACK to IBCF_B

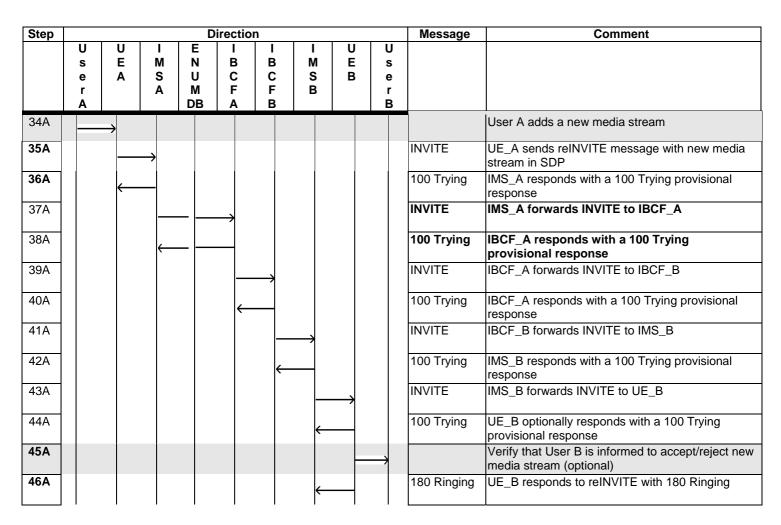
Step				Direc	tion					Message	Comment
	U s	U I	I E		I B	I M	U E		U s		
	e r	A S	3 L	ı c	C	S	В		e r		
62A	A	'	, D						В		
						\longrightarrow				ACK	IBCF_B forwards ACK to IMS_B
63A							\longrightarrow			ACK	IMS_B forwards ACK to UE_B
64A		>									User A modifies the media stream
65A		\longrightarrow								INVITE	UE_A sends reINVITE message with new media stream in SDP
66A										100 Trying	IMS_A responds with a 100 Trying provisional response
67A				\longrightarrow						INVITE	IMS_A forwards INVITE to IBCF_A
68A		•								100 Trying	IBCF_A responds with a 100 Trying provisional response
69A					\longrightarrow					INVITE	IBCF_A forwards INVITE to IBCF_B
70A										100 Trying	IBCF_A responds with a 100 Trying provisional response
71A										INVITE	IBCF_B forwards INVITE to IMS_B
72A										100 Trying	IMS_B responds with a 100 Trying provisional response
73A							\longrightarrow			INVITE	IMS_B forwards INVITE to UE_B
74A						+				100 Trying	UE_B optionally responds with a 100 Trying provisional response
75A									*		Verify that User B is informed to accept/reject media stream modification (optional)
76A						€				180 Ringing	UE_B responds to reINVITE with 180 Ringing
77A					•					180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
78A										180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
79A		•								180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
80A										180 Ringing	IMS_A forwards the 180 Ringing response to UE_A
81A	-	-									Verify that User A is informed that UE_B is alerting User B (optional)
82A								(If informed, User B accepts the media stream modification
83A						+				200 OK	UE_B responds with 200 OK to reINVITE
84A						<u> </u>				200 OK	IMS_B forwards 200 OK response to IBCF_B
85A										200 OK	IBCF_B forwards 200 OK response to IBCF_A
86A										200 OK	IBCF_A forwards 200 OK response to IMS_A
87A										200 OK	IMS_A forwards the 200 OK response to UE_A
88A	(-									User A is informed that media stream modification has been accepted
89A		\longrightarrow								ACK	UE_A acknowledges the receipt of 200 OK for INVITE

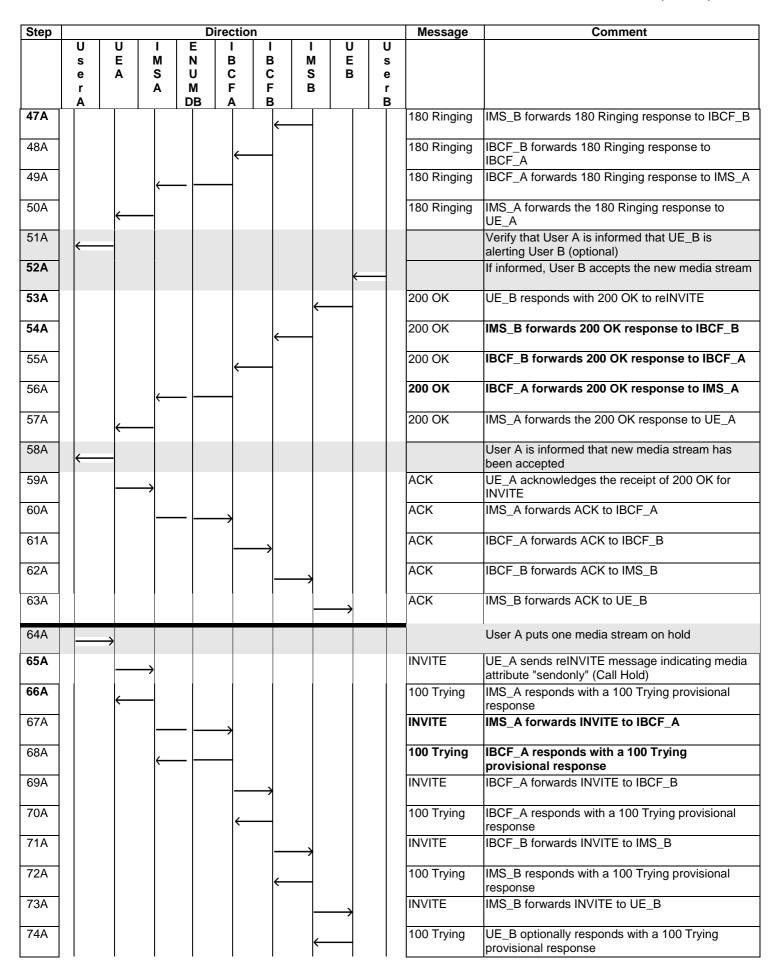
Step				D	irection					Message	Comment
-	U s e r A	U E A	M S A	E N U M DB	C F	B NC SF E	/I S	U E B	U s e r B		
90A				_	\rightarrow					ACK	IMS_A forwards ACK to IBCF_A
91A						>				ACK	IBCF_A forwards ACK to IBCF_B
92A							•			ACK	IBCF_B forwards ACK to IMS_B
93A								\rightarrow		ACK	IMS_B forwards ACK to UE_B
94								\leftarrow		BYE	User B releases the call
95										BYE	UE_B sends BYE to indicate that the call has ended
96						←—				BYE	IMS_B forwards the BYE to IBCF_B
97						_				BYE	IBCF_B forwards the BYE to IBCF_A
98			\leftarrow							BYE	IBCF_A forwards the BYE to IMS_A
99		\leftarrow								BYE	IMS_A forwards the BYE to UE_A
100	←	_									User A is informed that call has ended
101			\rightarrow							200 OK	UE_A responds to the BYE with 200 OK
102					\longrightarrow					200 OK	IMS_A forwards the 200 OK response to IBCF_A
103						>				200 OK	IBCF_A forwards the 200 OK response to IBCF_B
104						\longrightarrow				200 OK	IBCF_B forwards the 200 OK response to IMS_B
105								\rightarrow		200 OK	IMS_B forwards the 200 OK response to UE_B
106									\rightarrow		User B is informed that call has ended

4.5.3.1.3.8 Hold/resume media streams (reINVITE)

		Interoperability Test De	scription						
Identifier:		CALL_0021							
Summary:		ork handles subsequent INVITE	Es correctly during hold/resume of media						
	streams								
	Ta==								
Configuration:	CF_INT_0	CALL							
SUT:	IMS_A								
References:	Test Purp		Specification Reference						
	TP_IMS_		TS 124 229 [1], clause 5.4.3.2 ¶108 (6 th numbered list)						
	TP_IMS_	5121_01	TS 124 229 [1], clause 5.4.3.3 ¶123 (9 th numbered list)						
	TP_IMS_	5121_02	TS 124 229 [1], clause 5.4.3.3 ¶123 (9 th numbered list)						
Use Case ref.:	UC_13, U	JC 14	X						
Pre-test	• HSS	of IMS_A and of IMS B is confi	gured according to table 1						
conditions:			stablished to their respective IMS networks as						
		lause 4.2.1	·						
	• UE_A	A and UE_B support multiple m	edia streams (e.g. audio, video, messaging)						
	and s	support RTP and MSRP							
		A is registered in IMS_A using a							
	• UE_E	B is registered in IMS_B using a	ny user identity						
Test Sequence:	Step								
	1	User A calls User B (IMS VolF							
	2	Verify that user B is informed	of incoming call of User A						
	2	Verify that user B is informed Verify that user A is informed	of incoming call of User A						
	2 3 4	Verify that user B is informed Verify that user A is informed User B answers the call	of incoming call of User A that UE_B is ringing						
	2 3 4 5	Verify that user B is informed Verify that user A is informed User B answers the call Verify that user A is informed	of incoming call of User A that UE_B is ringing that call has been answered						
	2 3 4 5 6	Verify that user B is informed Verify that user A is informed User B answers the call Verify that user A is informed Verify that user B is informed	of incoming call of User A that UE_B is ringing that call has been answered that call is established						
	2 3 4 5 6 7	Verify that user B is informed Verify that user A is informed User B answers the call Verify that user A is informed Verify that user B is informed User A adds a new media street	of incoming call of User A that UE_B is ringing that call has been answered that call is established						
	2 3 4 5 6 7 8	Verify that user B is informed verify that user A is informed user B answers the call verify that user A is informed verify that user B is informed user A adds a new media streverify that user B is informed verify that user B is informed verify that user B is informed	of incoming call of User A that UE_B is ringing that call has been answered that call is established eam to accept/reject new media stream (optional)						
	2 3 4 5 6 7 8 9	Verify that user B is informed a Verify that user A is informed a User B answers the call Verify that user A is informed a Verify that user B is informed a User A adds a new media street Verify that User B is informed Verify that User A is informed Verify that User A is informed	that call has been answered that call is established eam to accept/reject new media stream (optional) that UE_B is alerting User B (optional)						
	2 3 4 5 6 7 8 9	Verify that user B is informed Verify that user A is informed User B answers the call Verify that user A is informed Verify that user B is informed User A adds a new media streverify that User B is informed Verify that User A is informed If informed, verify that User B	of incoming call of User A that UE_B is ringing that call has been answered that call is established eam to accept/reject new media stream (optional) that UE_B is alerting User B (optional) accepts the new media stream						
	2 3 4 5 6 7 8 9 10	Verify that user B is informed Verify that user A is informed User B answers the call Verify that user A is informed Verify that user B is informed User A adds a new media streverify that User B is informed Verify that User A is informed If informed, verify that User B Verify that User A is informed (optional)	that UE_B is ringing that call has been answered that call is established to accept/reject new media stream (optional) that UE_B is alerting User B (optional) accepts the new media stream that new media stream						
	2 3 4 5 6 7 8 9	Verify that user B is informed Verify that user A is informed User B answers the call Verify that user A is informed Verify that user B is informed User A adds a new media streverify that User B is informed Verify that User A is informed If informed, verify that User B Verify that User A is informed	that UE_B is ringing that call has been answered that call is established to accept/reject new media stream (optional) that UE_B is alerting User B (optional) accepts the new media stream that new media stream						
	2 3 4 5 6 7 8 9 10	Verify that user B is informed Verify that user A is informed User B answers the call Verify that user A is informed Verify that user B is informed User A adds a new media streverify that User B is informed Verify that User A is informed If informed, verify that User B Verify that User A is informed (optional)	that UE_B is ringing that call has been answered that call is established that call is established to accept/reject new media stream (optional) that UE_B is alerting User B (optional) accepts the new media stream that new media stream that new media stream has been accepted						
	2 3 4 5 6 7 8 9 10 11	Verify that user B is informed verify that user A is informed user B answers the call verify that user A is informed verify that user B is informed user A adds a new media streverify that user B is informed verify that user B is informed if informed, verify that user B verify that user A is informed (optional) user A puts one media stream	that UE_B is ringing that call has been answered that call is established that call is established to accept/reject new media stream (optional) that UE_B is alerting User B (optional) accepts the new media stream that new media stream that new media stream has been accepted on on hold that media stream is on hold						
	2 3 4 5 6 7 8 9 10 11	Verify that user B is informed a Verify that user A is informed a User B answers the call Verify that user B is informed a Verify that user B is informed a User A adds a new media street Verify that User B is informed a Verify that User A is informed a If informed, verify that User B Verify that User A is informed (optional) User A puts one media stream Verify that user B is informed	that UE_B is ringing that call has been answered that call is established that call is established to accept/reject new media stream (optional) that UE_B is alerting User B (optional) accepts the new media stream that new media stream that new media stream has been accepted to on hold that media stream is on hold that media stream is on hold						
	2 3 4 5 6 7 8 9 10 11	Verify that user B is informed User B answers the call Verify that user A is informed User B answers the call Verify that user B is informed User A adds a new media street Verify that User B is informed Verify that User A is informed If informed, verify that User B Verify that User A is informed (optional) User A puts one media stream Verify that user B is informed Verify that user A is informed User A resumes the media str	that UE_B is ringing that call has been answered that call is established that call is established to accept/reject new media stream (optional) that UE_B is alerting User B (optional) accepts the new media stream that new media stream that new media stream has been accepted to on hold that media stream is on hold that media stream is on hold						
	2 3 4 5 6 7 8 9 10 11	Verify that user B is informed User B answers the call Verify that user A is informed User B answers the call Verify that user B is informed User A adds a new media street Verify that User B is informed User A to user A is informed User A user A is informed User B is informed User A is informed User A is informed User A puts one media stream Verify that user B is informed User A resumes the media street Verify that user B is informed User A resumes the media street Verify that user B is informed User A resumes the media street Verify that user B is informed User A resumes B is informed Use	that Call has been answered that call has been answered that call is established eam to accept/reject new media stream (optional) that UE_B is alerting User B (optional) accepts the new media stream that new media stream that new media stream has been accepted on on hold that media stream is on hold that media stream is on hold that media stream is on hold team						
	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16	Verify that user B is informed User B answers the call Verify that user A is informed User B answers the call Verify that user B is informed User A adds a new media street Verify that User B is informed User A to user A is informed User A user A is informed User B is informed User A is informed User A is informed User A puts one media stream Verify that user B is informed User A resumes the media street Verify that user B is informed User A resumes the media street Verify that user B is informed User A resumes the media street Verify that user B is informed User A resumes B is informed Use	that call has been answered that call has been answered that call is established to accept/reject new media stream (optional) that UE_B is alerting User B (optional) accepts the new media stream that new media stream has been accepted to on hold that media stream is on hold that media stream is on hold that the media stream is resumed that the media stream is resumed						
	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	Verify that user B is informed User B answers the call Verify that user A is informed User B answers the call Verify that user B is informed User A adds a new media street Verify that User B is informed User A adds a new media street Verify that User A is informed If informed, verify that User B Verify that User A is informed (optional) User A puts one media stream Verify that user B is informed Verify that user B is informed User A resumes the media street Verify that user B is informed User A removes one of the media User A removes on	that call has been answered that call has been answered that call is established to accept/reject new media stream (optional) that UE_B is alerting User B (optional) accepts the new media stream that new media stream has been accepted to on hold that media stream is on hold that media stream is on hold that the media stream is resumed						
	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	Verify that user B is informed by Verify that user A is informed by Verify that user B is informed by Verify that User A is informed by Verify that User B is informed by Verify t	that call has been answered that call is established that ue been answered that call is established that call is established that call is established that accept/reject new media stream (optional) that ue being user bein						
	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	Verify that user B is informed by Verify that user A is informed by Verify that user A is informed by Verify that user B is informed by Verify that User A is informed by Verify that User A is informed by Verify that User A is informed by Verify that User B by Verify that user B is informed by Verify that user B	that Call has been answered that call has been answered that call is established to accept/reject new media stream (optional) that UE_B is alerting User B (optional) accepts the new media stream that new media stream has been accepted to on hold that media stream is on hold that media stream is on hold that the media stream is resumed						
	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21	Verify that user B is informed by Verify that user A is informed by Verify that user A is informed by Verify that user B is informed by Verify that User A is informed by Verify that user B is informed by Verify that user B is informed by Verify that user A is informed by Verify that user B is informed by Verify	that UE_B is ringing that call has been answered that call is established that call is established that call is established to accept/reject new media stream (optional) that UE_B is alerting User B (optional) accepts the new media stream that new media stream has been accepted that media stream is on hold that media stream is on hold that media stream is resumed that the media stream has been removed UE_B is alerting User B (optional)						
	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	Verify that user B is informed by Verify that user A is informed by Verify that user A is informed by Verify that user B is informed by Verify that User A is informed by Verify that User A is informed by Verify that User A is informed by Verify that User B by Verify that user B is informed by Verify that user B	that call has been answered that call has been answered that call is established that call is established to accept/reject new media stream (optional) that UE_B is alerting User B (optional) accepts the new media stream that new media stream that new media stream has been accepted to on hold that media stream is on hold that media stream is on hold that the media stream is resumed that the media stream is resumed that the media stream is resumed that the media stream has been removed UE_B is alerting User B (optional)						

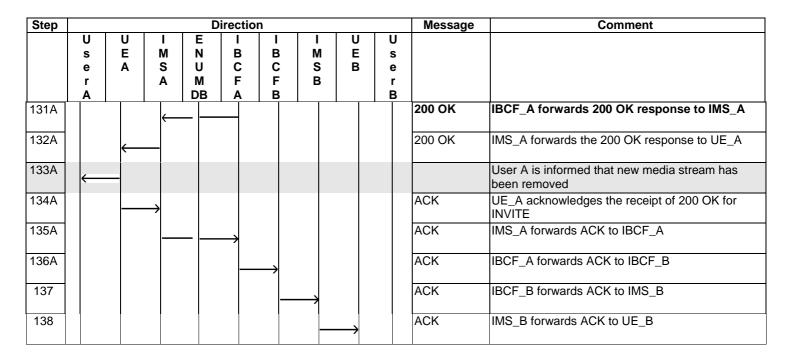
		Interoperability Test Description
Conformance Criteria:	Check	
	1	TP_IMS_5106_01 in CFW step 39A, 69A, 92A, 115A (reINVITE): ensure that { when { UE_A sends a subsequent INVITE to UE_B } then { IMS_B receives the subsequent INVITE
	2	TP_IMS_5121_01 in CFW step 40A, 70A, 93A, 114A, 116A (100 trying), 122A (180 ringing) ensure that { when { UE_B sends a 1xx response to UE_A } then { IMS_A receives the 1xx response containing a P-Charging-Vector_header not containing a access-network-charging-info_parameter } }
	3	TP_IMS_5121_02 in CFW step 55A, 78A, 101A, 130A (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 } }





Step					Direct	ion				Message	Comment
Ciop	U	U	I	Е	I	I	I	U		eeeage	
	s e	E A	M S	N U	B	B	M	E B	_		
	r		A	M	F	F	В		r		
75A	A			DB	A	B			B		User B is informed that media stream is on hold
76A							←			200 OK	UE_B responds with 200 OK to reINVITE
77A						•				200 OK	IMS_B forwards 200 OK response to IBCF_B
78A					(200 OK	IBCF_B forwards 200 OK response to IBCF_A
79A			←	_ _						200 OK	IBCF_A forwards 200 OK response to IMS_A
80A		←								200 OK	IMS_A forwards the 200 OK response to UE_A
81A	←										User A is informed that media stream is on hold
82A			\rightarrow							ACK	UE_A acknowledges the receipt of 200 OK for INVITE
83A				_ _	\rightarrow					ACK	IMS_A forwards ACK to IBCF_A
84A					_	\longrightarrow				ACK	IBCF_A forwards ACK to IBCF_B
85A						_				ACK	IBCF_B forwards ACK to IMS_B
86A								\longrightarrow		ACK	IMS_B forwards ACK to UE_B
87A		\rightarrow									User A resumes the media stream
A88			\rightarrow							INVITE	UE_A sends reINVITE message indicating media attribute "sendrecv" (Call Resume)
89A		←								100 Trying	IMS_A responds with a 100 Trying provisional response
90A				_	\longrightarrow					INVITE	IMS_A forwards INVITE to IBCF_A
91A			\leftarrow	_						100 Trying	IBCF_A responds with a 100 Trying provisional response
92A					_					INVITE	IBCF_A forwards INVITE to IBCF_B
93A					€					100 Trying	IBCF_A responds with a 100 Trying provisional response
94A						_				INVITE	IBCF_B forwards INVITE to IMS_B
95A						€				100 Trying	IMS_B responds with a 100 Trying provisional response
96A							_	\longrightarrow		INVITE	IMS_B forwards INVITE to UE_B
97A							←			100 Trying	UE_B optionally responds with a 100 Trying provisional response
98A											User B is informed that the media stream is resumed
99A							←			200 OK	UE_B responds to INVITE with 200 OK indicating media attribute "sendrecv"
100A						€				200 OK	IMS_B forwards 200 OK response to IBCF_B
101A					€					200 OK	IBCF_B forwards 200 OK response to IBCF_A
102A			\leftarrow							200 OK	IBCF_A forwards 200 OK response to IMS_A

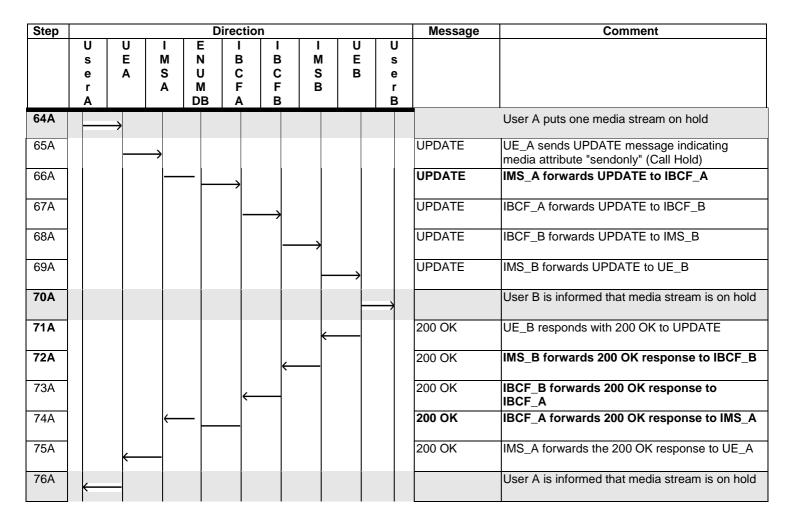
Step			Dire	ection				Message	Comment
	U U s E	I M	E N	I B E	I I	U	U s		
	e A	S		C		В	e		
	A		DB		3 1		B		
103A	←							200 OK	IMS_A forwards the 200 OK response to UE_A
104A	←								User A is informed that media stream is resumed
105A		\rightarrow						ACK	UE_A acknowledges the receipt of 200 OK for INVITE
106A			-	>				ACK	IMS_A forwards ACK to IBCF_A
107A								ACK	IBCF_A forwards ACK to IBCF_B
108A								ACK	IBCF_B forwards ACK to IMS_B
109A			l		-	──		ACK	IMS_B forwards ACK to UE_B
110A									User A removes one of the media streams
111A	_	\rightarrow						INVITE	UE_A sends reINVITE to IMS_A
112A	├							100 Trying	IMS_A responds with a 100 Trying provisional response
113A			-	>				INVITE	IMS_A forwards INVITE to IBCF_A
114A		\leftarrow	-					100 Trying	IBCF_A responds with a 100 Trying provisional response
115A								INVITE	IBCF_A forwards INVITE to IBCF_B
116A								100 Trying	IBCF_A responds with a 100 Trying provisional response
117A								INVITE	IBCF_B forwards INVITE to IMS_B
118A								100 Trying	IMS_B responds with a 100 Trying provisional response
119A						\longrightarrow		INVITE	IMS_B forwards INVITE to UE_B
120A								100 Trying	UE_B optionally responds with a 100 Trying provisional response
121A						_			User B is informed that the media stream has been removed
122A								180 Ringing	UE_B optionally responds to reINVITE with 180 Ringing
123A					\leftarrow			180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
124A								180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
125A			.					180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
126A	←	_						180 Ringing	IMS_A forwards the 180 Ringing response to UE_A
127A						(User A may be informed that UE_B is alerting User B (optional)
128A								200 OK	UE_B responds to INVITE with 200 OK with SDP where the port number for the video stream is set
129A								200 OK	IMS_B forwards 200 OK response to IBCF_B
130A					_			200 OK	IBCF_B forwards 200 OK response to IBCF_A
	1 1				1		1		



4.5.3.1.3.9 Hold/resume media streams (UPDATE)

		Interoperability Test Descri	ription							
ldentifier:		_CALL_0022								
Summary:	IMS netw	ork handles subsequent UPDATEs	s correctly during hold/resume of media							
	streams									
Configuration:	CF_INT_	CALL								
SUT:	IMS_A		12							
References:	Test Pur		Specification Reference							
		_5106_02	TS 124 229 [1], clause 5.4.3.2 ¶108 (6 th numbered list)							
	TP_IMS_	5121_02	TS 124 229 [1], clause 5.4.3.3 ¶123 (9 th numbered list)							
Use Case ref.:	UC_13, L	JC 14	The manual control many							
Pre-test	• HSS	of IMS_A and of IMS B is configur	ed according to table 1							
conditions:			lished to their respective IMS networks as							
		clause 4.2.1	morred to their respective livio fietworks as							
	a streams (e.g. audio video messaging)									
 UE_A and UE_B support multiple media streams (e.g. audio, vid and support RTP and MSRP 										
	UE_A is registered in IMS_A using any user identity									
	UE_B is registered in IMS_B using any user identity UE_B is registered in IMS_B using any user identity									
	UL_	D is registered in two_D daing any	user identity							
Test Sequence:	Step									
Test Sequence:	Step 1	User A calls User B (IMS VoIP ca	all)							
Test Sequence:	1	User A calls User B (IMS VoIP ca								
Test Sequence:		Verify that user B is informed of in	ncoming call of User A							
Test Sequence:	1 2		ncoming call of User A							
Test Sequence:	1 2 3	Verify that user B is informed of in Verify that user A is informed that User B answers the call	ncoming call of User A t UE_B is ringing							
Test Sequence:	1 2 3 4	Verify that user B is informed of it Verify that user A is informed that User B answers the call Verify that user A is informed that	ncoming call of User A t UE_B is ringing t call has been answered							
Test Sequence:	1 2 3 4 5	Verify that user B is informed of in Verify that user A is informed that User B answers the call	ncoming call of User A t UE_B is ringing t call has been answered t call is established							
Test Sequence:	1 2 3 4 5 6	Verify that user B is informed of in Verify that user A is informed that User B answers the call Verify that user A is informed that Verify that user B is informed that User A adds a new media stream	ncoming call of User A t UE_B is ringing t call has been answered t call is established							
Test Sequence:	1 2 3 4 5 6 7	Verify that user B is informed of in Verify that user A is informed that User B answers the call Verify that user A is informed that Verify that user B is informed that User A adds a new media stream Verify that User B is informed to a	t call has been answered t call is established accept/reject new media stream (optional)							
Test Sequence:	1 2 3 4 5 6 7 8	Verify that user B is informed of in Verify that user A is informed that User B answers the call Verify that user A is informed that Verify that user B is informed that User A adds a new media stream Verify that User B is informed to a Verify that User A is informed that	t call has been answered t call is established accept/reject new media stream (optional) t UE_B is alerting User B (optional)							
Test Sequence:	1 2 3 4 5 6 7 8 9	Verify that user B is informed of in Verify that user A is informed that User B answers the call Verify that user A is informed that Verify that user B is informed that User A adds a new media stream Verify that User B is informed to a Verify that User A is informed that If informed, verify that User B according to the verification	t call has been answered t call is established accept/reject new media stream (optional) t UE_B is alerting User B (optional) cepts the new media stream							
Test Sequence:	1 2 3 4 5 6 7 8 9 10	Verify that user B is informed of in Verify that user A is informed that User B answers the call Verify that user A is informed that Verify that user B is informed that User A adds a new media stream Verify that User B is informed to a Verify that User A is informed that If informed, verify that User B according to the Verify that User A is informed that (optional)	t call has been answered t call has been answered t call is established accept/reject new media stream (optional) t UE_B is alerting User B (optional) cepts the new media stream t new media stream							
Test Sequence:	1 2 3 4 5 6 7 8 9	Verify that user B is informed of in Verify that user A is informed that User B answers the call Verify that user A is informed that Verify that user B is informed that User A adds a new media stream Verify that User B is informed to a Verify that User A is informed that If informed, verify that User B according to the Verify that User A is informed that (optional) User A puts one media stream or	t call has been answered t call is established accept/reject new media stream (optional) t UE_B is alerting User B (optional) tepts the new media stream t new media stream t new media stream has been accepted							
Test Sequence:	1 2 3 4 5 6 7 8 9 10	Verify that user B is informed of in Verify that user A is informed that User B answers the call Verify that user A is informed that Verify that user B is informed that User A adds a new media stream Verify that User B is informed to a Verify that User A is informed that If informed, verify that User B according to the Verify that User A is informed that (optional)	t call has been answered t call is established accept/reject new media stream (optional) t UE_B is alerting User B (optional) tepts the new media stream t new media stream t new media stream has been accepted							

		Interoperability Test Description							
	15	User A resumes the media stream							
	16	Verify that user B is informed that the media stream is resumed							
	17	·							
		Verify that user A is informed that the media stream is resumed							
	18	User A removes one of the media streams							
	19	Verify that user B is informed that the media stream has been removed							
	20	User A releases the call							
	21	Verify that user Bis informed that call has ended							
	22	Verify that user A is informed that call has ended							
Conformance Criteria:	Check								
	2	TP_IMS_5106_02 in CFW step 67A, 80A and 103A (UPDATE): ensure that { when { UE_A sends an UPDATE to UE_B } then { IMS_B receives the UPDATE							



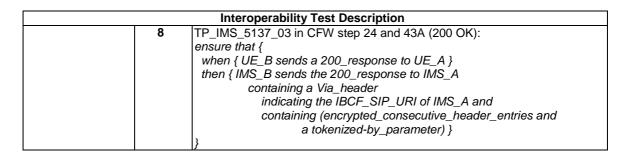
Step					Directi	on				Message	Comment
	U	Ū	I	E N	I	ı	I Na	U	U		
	s e	E A	M S	Ü	B	B C	M S	E B	s e		
	r A		Α	M DB	F	F B	В		r B		
77A)						1			User A resumes the media stream
78A			\rightarrow							UPDATE	UE_A sends UPDATE message indicating
79A										UPDATE	media attribute "sendrecv" (Call Resume) IMS_A forwards UPDATE to IBCF_A
80A										UPDATE	IBCF_A forwards UPDATE to IBCF_B
81A						\longrightarrow				UPDATE	IBCF_B forwards UPDATE to IMS_B
							\longrightarrow				
82A								──		UPDATE	IMS_B forwards UPDATE to UE_B
83A									\rightarrow		User B is informed that the media stream is resumed
84A							←			200 OK	UE_B responds to UPDATE with 200 OK indicating media attribute "sendrecv"
85A						←				200 OK	IMS_B forwards 200 OK response to IBCF_B
86A					←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
87A			\leftarrow	_						200 OK	IBCF_A forwards 200 OK response to IMS_A
88A										200 OK	IMS_A forwards the 200 OK response to UE_A
99A	(User A is informed that media stream is resumed
100A)									User A removes one of the media streams
101A			\rightarrow							UPDATE	UE_A sends UPDATE to IMS_A
102A				_	\longrightarrow					UPDATE	IMS_A forwards UPDATE to IBCF_A
103A					_	→				UPDATE	IBCF_A forwards UPDATE to IBCF_B
104A							\longrightarrow			UPDATE	IBCF_B forwards UPDATE to IMS_B
105A								\longrightarrow		UPDATE	IMS_B forwards UPDATE to UE_B
106A									\rightarrow		User B is informed that the media stream has been removed
107A							(200 OK	UE_B responds to INVITE with 200 OK
108A						←				200 OK	IMS_B forwards 200 OK response to IBCF_B
109A					<					200 OK	IBCF_B forwards 200 OK response to IBCF_A
110A			\leftarrow	_	_					200 OK	IBCF_A forwards 200 OK response to IMS_A
111A										200 OK	IMS_A forwards the 200 OK response to UE_A
112A	(User A is informed that new media stream has been removed

4.5.3.1.4 Dialogue Procedures - Topology Hiding

4.5.3.1.4.1 Normal call

	Interoperability Tes	st Description				
Identifier:	TD_IMS_CALL_0024					
Summary:	IMS network handles basic call with	topology hiding correctly				
Configuration:	CF_INT_CALL					
SUT:	IMS_A					
References:	Test Purpose	Specification Reference				
	TP_IMS_5135_01	TS 124 229 [1], clause 5.10.4.1 ¶7				
		(after note 4)				
	TP_IMS_5137_01	TS 124 229 [1], clause 5.10.4.2 ¶1				
		(item 7 & 8 in 1 st numbered list)				
	TP_IMS_5404_01	TS 124 229 [1], clause 5.10.2.2 ¶1				
		(item 8 in 1 st numbered list)				
	TP_IMS_5408_01	TS 124 229 [1], clause 5.10.2.3 ¶1				
		(item 4 in 1 st numbered list)				
	TP_IMS_5408_03	TS 124 229 [1], clause 5.10.2.3 ¶1				
		(item 4 in 1 st numbered list)				
	TP_IMS_5414_01	TS 124 229 [1], clause 5.10.3.2 ¶12				
	TD 1140 5407 00	(item 1 in 1 st numbered list)				
	TP_IMS_5137_02	TS 124 229 [1], clause 5.10.4.2 ¶1				
	TD 1140 5407 00	(1 st numbered list)				
	TP_IMS_5137_03	TS 124 229 [1], clause 5.10.4.2 ¶1				
Use Case ref.:	110, 00, 1	(1 st numbered list)				
use case rer.:	UC_02_I					
Pre-test	1100 (1110 A 1 (1110 D)					
conditions:	HSS of IMS_A and of IMS B is					
conditions.		rs established to their respective IMS networks as				
	per clause 4.2.1	in a construction of the sales.				
	UE_A is registered in IMS_A us					
	UE_B is registered in IMS_B us					
	 IMS_A is configured for topolog 	y niding				
Toot Common on	Cton					
Test Sequence:	Step					
	1 User A calls user B	and of incoming call of them A				
		med of incoming call of User A				
	3 Verify that user A is inform	ned that UE_B is ringing				
	4 User B answers the call	and that call has been anarraned				
		med that call has been answered				
		med that the call is established				
	7 User A ends the call	and that call has and ad				
	8 Verify that user B is inform					
	9 Verify that user A is infor	ned that call has ended				
Conformance	Check					
Criteria:		Matan 9 (INI)/ITE):				
Oriteria.	1 TP_IMS_5135_01 in CFV ensure that {	v step o (IIIvITE).				
		initial INVITE to IMS_A }				
	then { IMS_A sends the					
		additional topmost Record-Route_header				
		e IBCF_SIP_URI of IMS_A }				
	1 Indicating the	one of the orange of the orang				

	Interoperability Test Description
2	TP_IMS_5137_01 in CFW step 8 (INVITE):
	ensure that {
	when { UE_A sends an initial INVITE to UE_B }
	then { IMS_A sends the INVITE to IMS_B
	containing a Via_header
	indicating the IBCF_SIP_URI of IMS_A and
	containing (encrypted_consecutive_header_entries and
	a tokenized-by_parameter) and
	containing a Route_header
	indicating the IBCF_SIP_URI of IMS_A and
	containing (encrypted_consecutive_header_entries and
	a tokenized-by_parameter) }
3	TP_IMS_5404_01 in CFW step 8 (INVITE):
	ensure that {
	when { UE_A sends an initial INVITE to UE_B
	containing a P-Charging-Function-Addresses_header }
	then { IMS_A sends the INVITE
	not containing a P-Charging-Function-Addresses_header }
4	TP_IMS_5408_01 in CFW step 30 (ACK):
•	ensure that {
	when { UE_A sends an ACK to UE_B }
	then { IMS_A sends the ACK to IMS_B
	containing a Via_header
	indicating the IBCF_SIP_URI of IMS_A and
	containing (encrypted_consecutive_header_entries and
	a tokenized-by_parameter) and
	containing a Route_header
	indicating the IBCF_SIP_URI of IMS_A and
	containing (encrypted_consecutive_header_entries and
	a tokenized-by_parameter) }
	}
5	TP_IMS_5408_03 in CFW step 37A (BYE):
	ensure that {
	when { UE_A sends a BYE to UE_B }
	then { IMS_A sends the BYE to IMS_B
	containing a Via_header
	indicating the IBCF_SIP_URI of IMS_A and
	containing (encrypted_consecutive_header_entries and
	a tokenized-by_parameter) and
	containing a Route_header
	indicating the IBCF_SIP_URI of IMS_A and
	containing (encrypted_consecutive_header_entries and
	a tokenized-by_parameter) }
6	TP_IMS_5414_01 in CFW step 9 (100 Trying):
١	ensure that {
	when { UE_A sends an initial INVITE to UE_B and
	whom to series arrillian invite to OL_D and
	IMS A sends the INVITE to IMS R \
	IMS_A sends the INVITE to IMS_B } then { IMS_B sends a 100_response to IMS_A }
	<pre>IMS_A sends the INVITE to IMS_B } then { IMS_B sends a 100_response to IMS_A } }</pre>
7	then { IMS_B sends a 100_response to IMS_A } }
7	
7	then { IMS_B sends a 100_response to IMS_A } } TP_IMS_5137_02 in CFW step 17 (180 Ringing): ensure that {
7	then { IMS_B sends a 100_response to IMS_A } } TP_IMS_5137_02 in CFW step 17 (180 Ringing): ensure that { when { UE_B sends a 180_response to UE_A }
7	then { IMS_B sends a 100_response to IMS_A } } TP_IMS_5137_02 in CFW step 17 (180 Ringing): ensure that { when { UE_B sends a 180_response to UE_A } then { IMS_B sends the 180_response to IMS_A
7	then { IMS_B sends a 100_response to IMS_A } } TP_IMS_5137_02 in CFW step 17 (180 Ringing): ensure that { when { UE_B sends a 180_response to UE_A } then { IMS_B sends the 180_response to IMS_A containing a Via_header
7	then { IMS_B sends a 100_response to IMS_A } } TP_IMS_5137_02 in CFW step 17 (180 Ringing): ensure that { when { UE_B sends a 180_response to UE_A } then { IMS_B sends the 180_response to IMS_A
7	then { IMS_B sends a 100_response to IMS_A } } TP_IMS_5137_02 in CFW step 17 (180 Ringing): ensure that { when { UE_B sends a 180_response to UE_A } then { IMS_B sends the 180_response to IMS_A containing a Via_header indicating the IBCF_SIP_URI of IMS_A and
7	then { IMS_B sends a 100_response to IMS_A } } TP_IMS_5137_02 in CFW step 17 (180 Ringing): ensure that { when { UE_B sends a 180_response to UE_A } then { IMS_B sends the 180_response to IMS_A containing a Via_header indicating the IBCF_SIP_URI of IMS_A and containing (encrypted_consecutive_header_entries and



Step					Dire	ction					Message	Comment
	U	ū		E		Ī	Ī	I I	Ū	U		
	s e	E	N			B C	B C	M S	E B	s e		
	r	^				F	F	В	_	r		
	Ą			DE	3 .	Ą	В			В		
1		\rightarrow										User A calls User B
2			,								INVITE	UE_A sends INVITE with the first SDP offer
			1									indicating all desired medias and codecs that
3		←									100 Trying	IMS_A responds with a 100 Trying provisional response
4				\longrightarrow							ENUM	IMS_A sends query to ENUM DB
5				←							ENUM	ENUM DB sends response to IMS_A
6					;	,					INVITE	IMS_A forwards INVITE to IBCF_A
7				←		-					100 Trying	IBCF_A responds with a 100 Trying provisional response
8							\rightarrow				INVITE	IBCF_A forwards INVITE to IBCF_B
9						—	_				100 Trying	IBCF_B responds with a 100 Trying provisional response
10								\rightarrow			INVITE	IBCF_B forwards INVITE to IMS_B
11							—				100 Trying	IMS_B responds with a 100 Trying provisional response
12									\rightarrow		INVITE	IMS_B forwards INVITE to UE_B
13								—			100 Trying	UE_B optionally responds with a 100 Trying provisional response
14										\rightarrow		User B is informed of incoming call of User A
15								—			180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting
16							—				180 Ringing	IMS_B forwards 180 Ringing response to
17						—	_				180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
18											180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
19		+									180 Ringing	IMS_A forwards the 180 Ringing response to UE_A
20	—											User A is informed that UE_B is ringing
21									(User B answers call
22								—			200 OK	UE_B responds INVITE with 200 OK to indicate that the call has been answered
23							\leftarrow	_			200 OK	IMS_B forwards 200 OK response to IBCF_B

Step				Di	rectio	n				Message	Comment
	U	Ū		E	I	ı	I	U	U		
	s e	E A	M S	N U	B	B C	M S	E B	s e		
	r		Α	M	F	F	В		r		
24	A			DB	A	B		<u> </u>	B	200 OK	IBCF_B forwards 200 OK response to IBCF_A
25			←							200 OK	IBCF_A forwards 200 OK response to IMS_A
26		←								200 OK	IMS_A forwards 200 OK response to UE_A
27	←										User A is informed that call has been answered
28			\rightarrow							ACK	UE_A acknowledges the receipt of 200 OK for INVITE
29				_	\rightarrow					ACK	IMS_A forwards ACK to IBCF_A
30						\rightarrow				ACK	IBCF_A forwards ACK to IBCF_B
31							→			ACK	IBCF_B forwards ACK to IMS_B
32								\rightarrow		ACK	IMS_B forwards ACK to UE_B
33									\rightarrow		User B is informed that the call is established
34A		\rightarrow									User A ends call
35A			\rightarrow							BYE	UE_A releases the call with BYE
36A					\rightarrow					BYE	IMS_A forwards BYE to IBCF_A
37A						\rightarrow				BYE	IBCF_A forwards BYE to IBCF_B
38A							\rightarrow			BYE	IBCF_B forwards BYE to IMS_B
39A								\rightarrow		BYE	IMS_B forwards BYE to UE_B
40A									\rightarrow		User B is informed that call has ended
41A							—			200 OK	UE_B sends 200 OK for BYE
42A						—				200 OK	IMS_B forwards 200 OK response to IBCF_B
43A					←					200 OK	IBCF_B forwards 200 OK response to IBCF_A
44A			←							200 OK	IBCF_A forwards 200 OK response to IMS_A
45A		K								200 OK	IMS_A forwards the 200 OK response to UE_A
46A	—										User B is informed that call has ended

4.5.3.1.4.2 CANCEL call by calling user

		Interoperability Test Descr	ription									
Identifier:		CALL_0025										
Summary:	IMS netwo	ork handles calling user cancelling	call correctly before its establishment with									
	topology h											
Configuration:	CF_INT_0	CALL										
SUT:	IMS_A an	d IMS_B										
References:	Test Purpose Specification Reference											
	TP_IMS_5	5408_02	TS 124 229 [1], clause 5.10.2.3 ¶1									
			(item 4 in 1 st numbered list)									
Use Case ref.:	UC_02_I											
Pre-test	• HSS	of IMS_A and of IMS B is configur	ed according to table 1									
conditions:			olished to their respective IMS networks as									
	per cl	ause 4.2.1	·									
	• UE A	is registered in IMS_A using any	user identity									
		is registered in IMS_B using any										
		A is configured for topology hiding										
	_	1 0, 0										
Test Sequence:	Step											
•	1	User A calls User B										
	2	Verify that user B is informed of incoming call of User A										
	3	Verify that user A is informed that										
	4	User A cancels call										
	5	Verify that user B is informed that	t call has been cancelled									
	6	Verify that user A is informed that										
Conformance	Check											
Criteria:	1	TP_IMS_5408_02 in CFW step 2	26 (CANCEL):									
		ensure that {	,									
		when { UE_A sends a CANCEL										
		then { IMS_A sends the CANCE										
		containing a Via_heade										
			SIP_URI of IMS_A and									
			d_consecutive_header_entries and									
			by_parameter) and									
		containing a Route_he										
			SIP_URI of IMS_A and									
		• • • • • • • • • • • • • • • • • • • •	d_consecutive_header_entries and									
		a tokenized-k	by_parameter) }									
		<i>}</i>										

Step				Di	rectio	า				Message	Comment
	U s e r A	U E A	M S A	E N U M DB	I B C F A	- B C F B	- M S B	U E B	U s e r B		
1		\rightarrow									User A calls User B
2			\rightarrow							INVITE	UE_A sends INVITE with the first SDP offer indicating all desired medias and codecs that
3		\leftarrow								100 Trying	IMS_A responds with a 100 Trying provisional response
4				\rightarrow						ENUM	IMS_A sends query to ENUM DB
5			\leftarrow	_						ENUM	ENUM DB sends response to IMS_A
6			_		\rightarrow					INVITE	IMS_A forwards INVITE to IBCF_A
7			\leftarrow							100 Trying	IBCF_A responds with a 100 Trying provisional response
8						\rightarrow				INVITE	IBCF_A forwards INVITE to IBCF_B

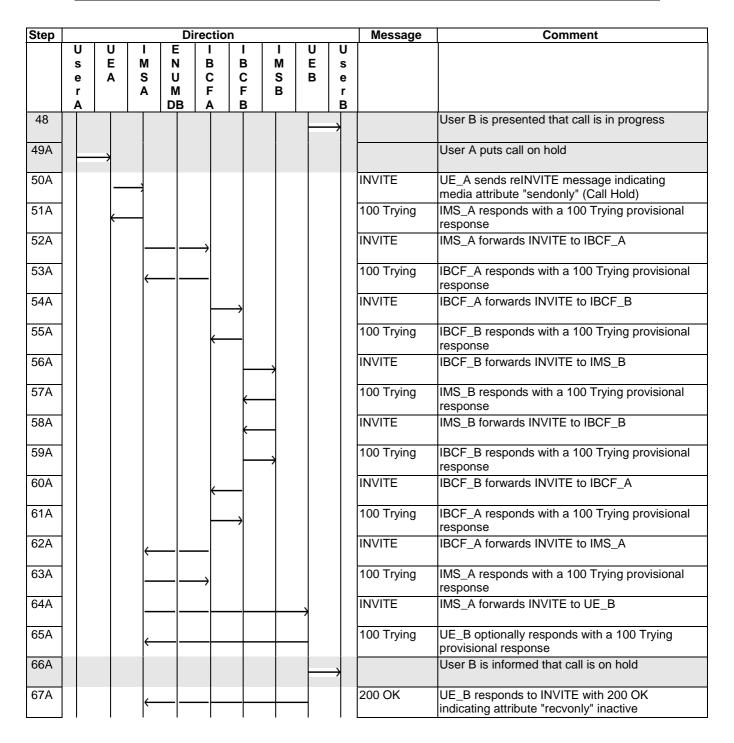
Step				Direc	tion				Message	Comment
	U s	U E	I E		I I 3 B	I B M	U	U		
	е	Α	S L A N	ן נ		S	В	е		
	r A		A N		AB			r B		
9									100 Trying	IBCF_B responds with a 100 Trying provisional response
10						──			INVITE	IBCF_B forwards INVITE to IMS_B
11									100 Trying	IMS_B responds with a 100 Trying provisional response
12							\longrightarrow		INVITE	IMS_B forwards INVITE to UE_B
13						(100 Trying	UE_B optionally responds with a 100 Trying provisional response
14							_	\rightarrow		User B is informed of incoming call of User A
15						(180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting
16									180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
17									180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
18									180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
		-	-						180 Ringing	IMS_A forwards the 180 Ringing response to UE_A
20	(User A is informed that UE_B is ringing
21										User A cancels the Call
22			*						CANCEL	UE_A sends a CANCEL to IMS_A
23			-						200 OK	IMS_A responds with a 200 OK to UE_A
24				\longrightarrow					CANCEL	IMS_A forwards the CANCEL to IBCF_A
25									200 OK	IBCF_A responds with a 200 OK to IMS_A
26					\longrightarrow				CANCEL	IBCF_A forwards the CANCEL to IBCF_B
27					 				200 OK	IBCF_B responds with a 200 OK to IBCF_A
28						\longrightarrow			CANCEL	IBCF_B forwards the CANCEL to IMS_B
29									200 OK	IMS_B responds with a 200 OK to IBCF_B
30							\longrightarrow		CANCEL	IMS_B forwards the CANCEL to UE_B
31						(200 OK	UE_B responds with a 200 OK to IMS_B
32								\rightarrow		User B is informed that call has been cancelled
33						(487 Request Terminated	UE_B sends 487 Request Terminated to IMS_B
34							\longrightarrow		ACK	IMS_B responds with ACK to UE_B
35									487 Request Terminated	IMS_B forwards the 487 Request Terminated to IBCF_B
36						\longrightarrow			ACK	IBCF_B responds with ACK to IMS_B
	ı	ı	1	ı	1 1	I	1	ı	<u> </u>	,

Step				Di	rectio	n				Message	Comment
	U s e r A	U E A	M S A	E N U M DB	I B C F A	I B C F B	M S B	U E B	U s e r B		
37					<u></u>					487 Request Terminated	IBCF_B forwards the 487 Request Terminated to IBCF_A
38						\rightarrow				ACK	IBCF_A responds with ACK to IBCF_B
39			←							487 Request Terminated	IBCF_A forwards the 487 Request Terminated to IMS_A
40					\rightarrow					ACK	IMS_A responds with ACK to IBCF_A
41		\leftarrow								487 Request Terminated	IMS_A forwards the 487 Request Terminated to UE_A
42			\rightarrow							ACK	UE_A responds with ACK to IMS_A
43	\leftarrow										User A is informed that call is terminated

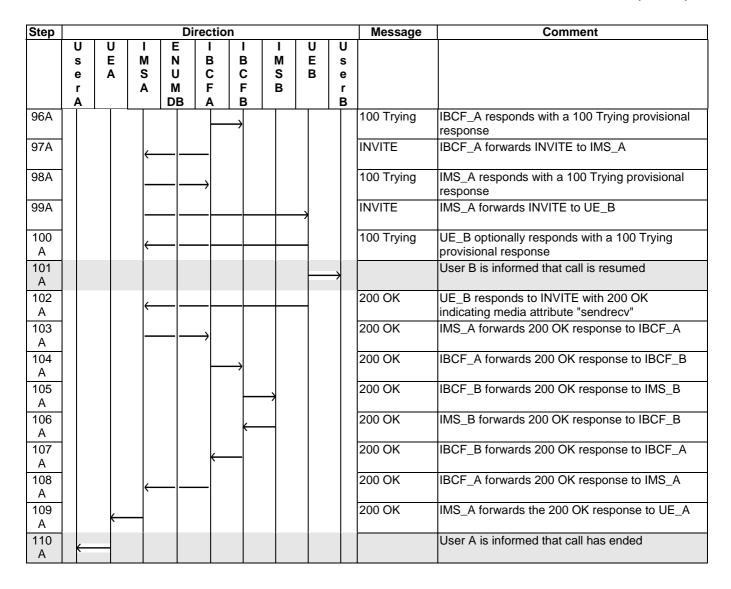
4.5.3.1.4.3 Normal call with hold/resume

		Interoperability Test Des	cription
Identifier:	TD_IMS_	_CALL_0026	
Summary:			d and resume correctly when a home caller
	puts a roa	aming user on hold and resumes	call with topology hiding
Configuration:	CF_ROA	M_CALL	
SUT:	IMS_A		
References:	Test Pur	pose	Specification Reference
	TP_IMS_	5408_04	TS 124 229 [1], clause 5.10.2.3 ¶1 (item 4 in 1 st numbered list)
			(item 4 in 1 st numbered list)
Use Case ref.:	UC_03_F	र	
Pre-test	 HSS 	of IMS_A and of IMS B is configu	ured according to table 1
conditions:	_	-	ablished to their respective IMS networks as
		clause 4.2.1	
		A configured to perform user initia	
		A is registered in IMS_A using an	
	 UE_ 	B is registered via IMS_A in IMS_	B using any user identity
	 IMS_ 	_A is configured for topology hidir	ıg
Test Sequence:	Step		
	1	User A calls User B	
	2	Verify that user B is informed of	
	3	Verify that user A is informed th	at UE_A is ringing
	4	User B answers call	
	5	Verify that user A is informed th	
	6	Verify that user B is informed th	at call is established
	7	User A puts call on hold	
	8	Verify that user B is informed th	
	9	Verify that user A is informed th	at call is on hold
	10	User A resumes call	
		Verify that user B is informed th	at call is resumed
	11	Verily that user D is illigithed th	at call is resulted
	11 12	Verify that user A is informed th	
	12	Verify that user A is informed th	at call is resumed
	12 13	Verify that user A is informed th User A ends call	at call is resumed at call has ended

		Interoperability Test Description
Conformance	Check	
Criteria:	1	TP_IMS_5408_04 in CFW step 54A and 89A (INVITE): ensure that { when { UE_A sends a subsequent INVITE to UE_B } then { IMS_A sends the INVITE to IMS_B



No.	Step					ectio	n				Message	Comment
68A					E N	I B	I B	I M				
A DB A B B B B B B B B		е	Α	S	U	С	С	S		е		
200 OK IBCF_A forwards 200 OK response to IBCF_B												
70A 71A 71A 71A 71A 71A 71A 71A 72A 73A 73A 74A 75A 75A 76A 75A 76A 76A 77A 76A 77A 78A 78A 78A 78A 78A 78A 78A 78A 78	68A				_	\rightarrow					200 OK	IMS_A forwards 200 OK response to IBCF_A
71A 72A 73A 73A 73A 74A 75A 75A 76A 76A 77A 78A 78A 79A 80A 81A 85A 86A 87A 88A 89A 99A 99A 99A 99A 99A 99A 99A	69A						\rightarrow				200 OK	IBCF_A forwards 200 OK response to IBCF_B
72A 73A 73A 74A 75A 75A 76A 75A 76A 77A 78A 78A 78A 79A 80A 81A 88A 89A 99A 99A 99A 99A 99A 99A 99A 99	70A							\rightarrow			200 OK	IBCF_B forwards 200 OK response to IMS_B
200 OK IBCF_A forwards 200 OK response to IMS_A 200 OK IMS_A forwards 200 OK response to UE_A ACK UE_A acknowledges the receipt of 200 OK for INVITE ACK IMS_A forwards ACK to IBCF_A ACK IBCF_B forwards ACK to IBCF_B INVITE UE_A sends reINVITE message indicating media attribute "sendrecv" (Call Resume) INVITE IMS_A forwards INVITE to IBCF_B INVITE IBCF_B responds with a 100 Trying provisional response INVITE IBCF_B forwards INVITE to IBCF_B	71A						←				200 OK	IMS_B forwards 200 OK response to IBCF_B
200 OK IMS_A forwards 200 OK response to UE_A ACK UE_A acknowledges the receipt of 200 OK for INVITE ACK IMS_A forwards ACK to IBCF_A ACK IBCF_A forwards ACK to IBCF_B ACK IBCF_B forwards ACK to IBCF_A ACK IBCF_A forwards ACK to IBCF_A ACK IBCF_B forwards ACK to IBCF_B INVITE UE_A sends reINVITE message indicating media attribute "sendrecv" (Call Resume) INVITE IBCF_A responds with a 100 Trying provisional response INVITE IBCF_B forwards INVITE to IBCF_B	72A					\leftarrow					200 OK	IBCF_B forwards 200 OK response to IBCF_A
ACK UE_A acknowledges the receipt of 200 OK for INVITE ACK IMS_A forwards ACK to IBCF_A ACK IBCF_A forwards ACK to IBCF_B ACK IBCF_B forwards ACK to IBCF_A ACK IBCF_B forwards ACK to IBCF_A ACK IBCF_A forwards ACK to IBCF_A IBCF_A forwards ACK to IBCF_A BCK IBCF_A forwards ACK to IBCF_A ACK IBCF_A forwards ACK to IBCF_A IBCF_A forwards ACK to IBCF_A IBCF_A forwards ACK to IBCF_A IBCF_A forwards INVITE IBCF_A INVITE IBCF_A forwards INVITE to IBCF_B INVITE IBCF_B forwards INVITE to IBCF_B	73A			←	_	_					200 OK	IBCF_A forwards 200 OK response to IMS_A
INVITE	74A			-							200 OK	IMS_A forwards 200 OK response to UE_A
ACK IMS_A forwards ACK to IBCF_A ACK IBCF_B forwards ACK to IBCF_B ACK IBCF_B forwards ACK to IBCF_A ACK IBCF_B forwards ACK to IBCF_A ACK IBCF_A forwards ACK to IBCF_A ACK IBCF_A forwards ACK to IMS_A ACK IBCF_A forwards ACK to UE_B User A is informed that call is on hold User A resumes call INVITE UE_A sends reINVITE message indicating media attribute "sendrecv" (Call Resume) IMS_A responds with a 100 Trying provisional response INVITE IBCF_A forwards INVITE to IBCF_A 100 Trying IBCF_A responds with a 100 Trying provisional response INVITE IBCF_B forwards INVITE to IBCF_B	75A			*							ACK	
ACK IBCF_B forwards ACK to IMS_B ACK IMS_B forwards ACK to IBCF_B ACK IBCF_B forwards ACK to IBCF_A ACK IBCF_B forwards ACK to IBCF_A ACK IBCF_A forwards ACK to IBCF_A ACK IMS_A forwards ACK to IMS_A ACK IMS_A forwards ACK to UE_B User A is informed that call is on hold User A resumes call INVITE UE_A sends reINVITE message indicating media attribute "sendreov" (Call Resume) 100 Trying IMS_A responds with a 100 Trying provisional response INVITE IMS_A forwards INVITE to IBCF_A 100 Trying IBCF_B responds with a 100 Trying provisional response INVITE IBCF_A forwards INVITE to IMS_B 100 Trying IMS_B responds with a 100 Trying provisional response INVITE IBCF_B forwards INVITE to IMS_B 100 Trying IMS_B responds with a 100 Trying provisional response INVITE IMS_B forwards INVITE to IBCF_B 100 Trying IMS_B responds with a 100 Trying provisional response INVITE IMS_B forwards INVITE to IBCF_B 100 Trying IMS_B responds with a 100 Trying provisional response	76A				_	\rightarrow					ACK	IMS_A forwards ACK to IBCF_A
ACK IMS_B forwards ACK to IBCF_B ACK IBCF_B forwards ACK to IBCF_A ACK IBCF_A forwards ACK to IMS_A ACK IMS_A forwards ACK to UE_B B3A B4A B5A B6A B7A B8A B8A B9A 90A 91A 92A 93A 94A	77A						\rightarrow				ACK	IBCF_A forwards ACK to IBCF_B
ACK IBCF_B forwards ACK to IBCF_A ACK IBCF_A forwards ACK to IMS_A ACK IBCF_A forwards ACK to IMS_A ACK IMS_A forwards ACK to UE_B User A is informed that call is on hold User A resumes call INVITE UE_A sends reINVITE message indicating media attribute "sendrecv" (Call Resume) 100 Trying IMS_A responds with a 100 Trying provisional response INVITE IMS_A forwards INVITE to IBCF_A 100 Trying IBCF_A responds with a 100 Trying provisional response INVITE IBCF_B responds with a 100 Trying provisional response INVITE IBCF_B forwards INVITE to IMS_B 100 Trying IMS_B responds with a 100 Trying provisional response INVITE IMS_B forwards INVITE to IBCF_B 100 Trying IMS_B responds with a 100 Trying provisional response INVITE IMS_B forwards INVITE to IBCF_B 100 Trying IMS_B responds with a 100 Trying provisional response	78A							\rightarrow			ACK	IBCF_B forwards ACK to IMS_B
ACK IBCF_A forwards ACK to IMS_A ACK IMS_A forwards ACK to UE_B BSA User A is informed that call is on hold User A resumes call INVITE UE_A sends reINVITE message indicating media attribute "sendrecv" (Call Resume) 100 Trying IMS_A responds with a 100 Trying provisional response INVITE IMS_A forwards INVITE to IBCF_A 100 Trying IBCF_A forwards INVITE to IBCF_B 100 Trying IBCF_B responds with a 100 Trying provisional response INVITE IBCF_B forwards INVITE to IMS_B 100 Trying IMS_B responds with a 100 Trying provisional response INVITE IBCF_B forwards INVITE to IMS_B 100 Trying IMS_B responds with a 100 Trying provisional response INVITE IMS_B forwards INVITE to IBCF_B 100 Trying IMS_B responds with a 100 Trying provisional response	79A						←				ACK	IMS_B forwards ACK to IBCF_B
82A 83A 84A 85A 86A 87A 88A 89A 90A 91A 92A 93A 94A	80A					\leftarrow					ACK	IBCF_B forwards ACK to IBCF_A
User A is informed that call is on hold User A resumes call INVITE UE_A sends reINVITE message indicating media attribute "sendrecv" (Call Resume) 100 Trying IMS_A responds with a 100 Trying provisional response INVITE IBCF_A responds with a 100 Trying provisional response INVITE IBCF_B forwards INVITE to IBCF_B 100 Trying IBCF_B responds with a 100 Trying provisional response INVITE IBCF_B forwards INVITE to IMS_B 100 Trying IMS_B responds with a 100 Trying provisional response INVITE IMS_B forwards INVITE to IBCF_B 100 Trying IMS_B responds with a 100 Trying provisional response INVITE IMS_B forwards INVITE to IBCF_B 100 Trying IMS_B responds with a 100 Trying provisional response	81A				_	_					ACK	IBCF_A forwards ACK to IMS_A
B5A B6A B7A B8A B9A B9A B9A B9A B9A B9A B9A B9A B9A B9	82A				_				\rightarrow		ACK	IMS_A forwards ACK to UE_B
INVITE UE_A sends reINVITE message indicating media attribute "sendrecv" (Call Resume)	83A	—										User A is informed that call is on hold
media attribute "sendrecv" (Call Resume) 100 Trying IMS_A responds with a 100 Trying provisional response INVITE IMS_A forwards INVITE to IBCF_A 100 Trying IBCF_A responds with a 100 Trying provisional response INVITE IBCF_A forwards INVITE to IBCF_B 100 Trying IBCF_B responds with a 100 Trying provisional response INVITE IBCF_B forwards INVITE to IMS_B 100 Trying IMS_B responds with a 100 Trying provisional response INVITE IMS_B forwards INVITE to IBCF_B 100 Trying IMS_B responds with a 100 Trying provisional response INVITE IMS_B forwards INVITE to IBCF_B 100 Trying IMS_B responds with a 100 Trying provisional response	84A)									User A resumes call
86A 87A 88A 89A 90A 91A 92A 93A 94A	85A		-	>							INVITE	
88A 89A 90A 91A 92A 93A 94A INVITE IMS_A forwards INVITE to IBCF_A INVITE IBCF_A responds with a 100 Trying provisional response INVITE IBCF_A forwards INVITE to IBCF_B INVITE IBCF_B responds with a 100 Trying provisional response INVITE IBCF_B forwards INVITE to IMS_B INVITE IMS_B responds with a 100 Trying provisional response INVITE IMS_B forwards INVITE to IBCF_B INVITE IMS_B forwards INVITE to IBCF_B INVITE IMS_B responds with a 100 Trying provisional response	86A			-							100 Trying	IMS_A responds with a 100 Trying provisional
90A 90A 91A 92A 93A 94A Tesponse INVITE IBCF_A forwards INVITE to IBCF_B INVITE IBCF_B responds with a 100 Trying provisional response INVITE IBCF_B forwards INVITE to IMS_B INVITE IMS_B responds with a 100 Trying provisional response INVITE IMS_B forwards INVITE to IBCF_B INVITE IMS_B forwards INVITE IMS_B	87A				_	\rightarrow					INVITE	
90A 91A 92A 93A 94A INVITE IBCF_A forwards INVITE to IBCF_B 100 Trying IBCF_B responds with a 100 Trying provisional response 100 Trying IMS_B responds with a 100 Trying provisional response INVITE IMS_B forwards INVITE to IBCF_B 100 Trying IMS_B responds with a 100 Trying provisional response 100 Trying IBCF_B responds with a 100 Trying provisional response	88A				-	_					100 Trying	1
91A 92A 93A 94A response INVITE IBCF_B forwards INVITE to IMS_B 100 Trying IMS_B responds with a 100 Trying provisional response INVITE IMS_B forwards INVITE to IBCF_B 100 Trying IBCF_B responds with a 100 Trying provisional response	89A						\rightarrow				INVITE	
91A 92A 93A 94A INVITE IBCF_B forwards INVITE to IMS_B 100 Trying IMS_B responds with a 100 Trying provisional response INVITE IMS_B forwards INVITE to IBCF_B 100 Trying IBCF_B responds with a 100 Trying provisional response	90A					\leftarrow	_				100 Trying	
93A 94A Invite Ims_B forwards Invite to IBCF_B	91A							\rightarrow			INVITE	
93A 94A INVITE IMS_B forwards INVITE to IBCF_B 100 Trying IBCF_B responds with a 100 Trying provisional response	92A						—				100 Trying	
response	93A						—				INVITE	
	94A							\rightarrow			100 Trying	
	95A					\leftarrow	_				INVITE	-



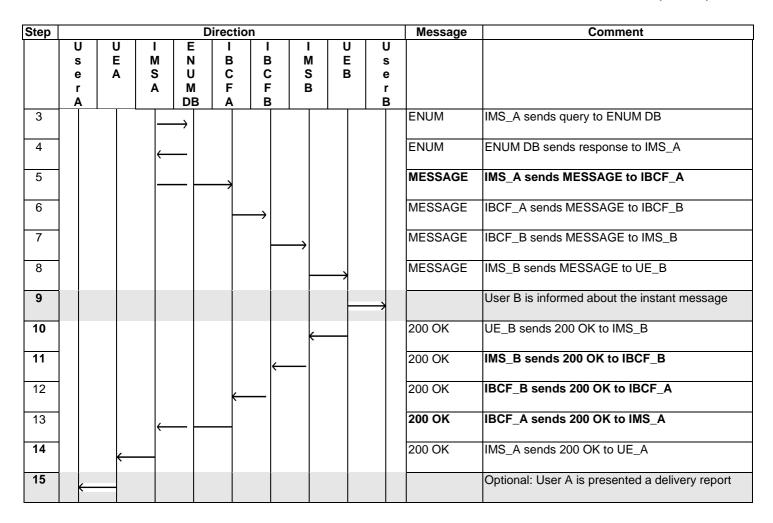
4.5.4 Messaging

4.5.4.1 Messaging with ENUM lookup procedure

	Interoperability Test Des	scription								
Identifier:	TD_IMS_MESS_0004									
Summary:										
Configuration:	CF_INT_CALL									
SUT:	IMS_A									
References:	Test Purpose	Specification Reference								
	TP_IMS_ENUM_01	TS 124 229 [1], clause 5.4.3.2 ¶11 (item 10 in 1 st numbered list)								
	TP_IMS_5097_08	TS 124 229 [1], clause 5.4.3.2 ¶11 (item 10 in 1 st numbered)								
	TP_IMS_5117_06	TS 124 229 [1], clause 5.4.3.3 ¶44								
Use Case ref.:	UC_05_I									
Pre-test conditions:	 HSS of IMS_A and of IMS B is con UE_A and UE_B have IP beard networks as per clause 4.2.1 UE_A is registered in IMS_A using UE_B is registered in IMS_B using IMS_A is within the trust domain of Common DNS is configured with a 	any user identity userTEL_priv according to table 1 fIMS_B								

		Interoperability Test Description
	 MES 	SAGE request and response has to be supported at II-NNI
		129 165 [16] see Table 6.1 and Table 6.3)
	(10	120 100 [10] 000 1 asia 0.1 ana 1 asia 0.0)
Test Sequence:	Step	
i est sequence.		User A conde message to user P's Tel LIPL (i.e. userTEL in IMS_P)
	1	User A sends message to user B's Tel URI (i.e. userTEL in IMS_B)
	2	Verify that user B receives message from user A
2	Observe	
Conformance	Check	TRUMO FAMILIA OLI CERVI (A (MARTER R
Criteria:	1	TP_IMS_ENUM_01 in CFW step 4 (NAPTR Response):
		ensure that {
		when { UE_A sends an initial INVITE for UE_B to IMS_A
		containing a Request_URI
		indicating a Tel_URI
		and IMS_A sends a NAPTR_Query to ENUM_DB
		containing the TN derived_from the Tel_URI_E.164_Number
]
		then { ENUM_DB sends a NAPTR_Response to IMS_A
		containing a NAPTR_Resource_Record
		containing the TTL of the NAPTR_record
		containing the service_type
		indicating E2U+sip
		containing the_regular_expressiob
		indicating !^(.*)\$!
		containing the SIP_URI of UE_B
		indicating backreference (\1) for the user part
		indicating domain name for the host part
		containing SIP_URI_parameters 'if applicable' }
	2	TP_IMS_5097_08 in CFW step 6 (MESSAGE)
		ensure that {
		when { UE_A sends a MESSAGE to UE_B
		containing a Request_URI
		indicating a Tel_URI }
		then { IMS_A sends a NAPTR_Query to ENUM DB
		containing the Tel_URI_E.164_Number }
		when { IMS_A receives NAPTR_Response
		containing a NAPTR_Resource_Record
		indicating the SIP_URI of UE_B }
		then { IMS_A sends the MESSAGE to IMS_B
		containing a Request_URI
		indicating a Nequest_ON
		containing a P-Charging-Vector_header
		not containing a r -charging-vector_neader not containing a access-network-charging-info_parameter }
		Tiot containing a access-fietwork-charging-inio_parameter /
		/
	3	TP_IMS_5117_06 in CFW step 12 (200 OK)
	3	· · · · · · · · · · · · · · · · · · ·
		ensure that {
		when { UE_B sends a 2xx_response to UE_A
		than (IMC A received the Day represent
		then { IMS_A receives the 2xx_response
		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}
]}
	1	ען

Step				D	irectio	n			Message	Comment	
	υ	U	ı	Е	I	I	ı	U	U		
	s	E	M	N	В	В	M	Е	S		
	е	Α	S	U	C	C	S	В	е		
	r		Α	M	F	F	В		r		
	Ą			DB	Α	В			В		
1		\rightarrow									User A sends an instant message to user B
2			\rightarrow							MESSAGE	UE_A sends MESSAGE to IMS_A

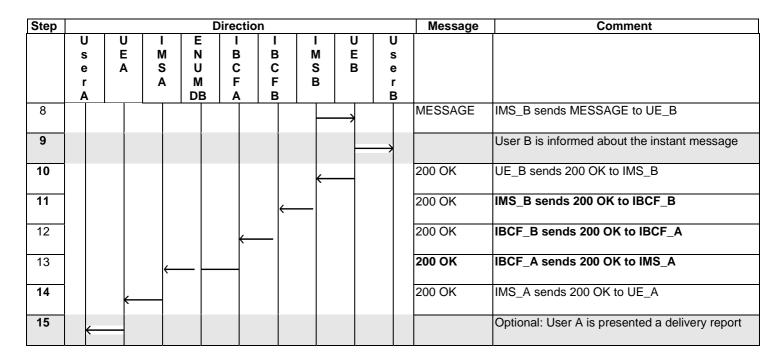


4.5.4.2 Messaging with SIP URI public identities

	Interoperability To	est Description									
Identifier:	TD_IMS_MESS_0002	•									
Summary:	IMS network handles messaging w	rith SIP identity correctly without topology hiding									
Configuration:	· · · · · · · · · · · · · · · · · · ·										
SUT:	IMS_B										
References:	Test Purpose	Specification Reference									
	TP_IMS_5097_05	TS 124 229 [1], clause 5.4.3.2 ¶1									
	TP_IMS_5097_06	TS 124 229 [1], clause 5.4.3.2 ¶11									
		(item 9 in 1 st numbered list)									
	TP_IMS_5117_02	TS 124 229 [1], clause 5.4.3.3 ¶100									
		(item 2 in 5 th numbered list)									
	TP_IMS_5118_01	TS 124 229 [1], clause 5.4.3.3 ¶105									
		(item 2 in 6 th numbered list)									
Use Case ref.:	UC_05_I										
Pre-test	HSS of IMS_A and of IMS B is										
conditions:		ers established to their respective IMS networks as									
	per clause 4.2.1										
		sing userSIP_priv according to table 1									
	 UE_B is registered in IMS_B us 	• •									
	 IMS_A is within the trust domai 	——————————————————————————————————————									
	 UE_A and UE_B registered with 										
	 IMS_A not configured for topolo 	ogy hiding									
	 MESSAGE request and respon 	se has to be supported at II-NNI (TS 129 165 [16]									
	see Tables 6.1 and 6.3)										
Test Sequence:	Step										
	1 User A sends message	to user B									

		Interoperability Test Description
	2	Verify that user B receives message from user A
Conformance	Check	
Criteria:	1	TP_IMS_5097_05 in CFW step 6 (MESSAGE)
		ensure that {
		when { UE_A sends a MESSAGE to UE_B }
		then { IMS_B receives the MESSAGE
		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) }
		}
	2	TP_IMS_5097_06 in CFW step 6 (MESSAGE)
		ensure that {
		when { UE_A sends a MESSAGE to UE_B
		}
		then { IMS_B receives the MESSAGE
		containing a P-Asserted-Identity_header
		indicating the SIP_URI of UE_A and
		containing a P-Asserted-Identity_header
		indicating the Tel_URI of UE_A }
		}
	3	TP_IMS_5117_02 in CFW step 12 (200 OK)
		ensure that {
		when { UE_B sends a 2xx_response to UE_A }
		then { IMS_A receives the 2xx_response
		containing a P-Charging-Vector_header
		not containing an access-network-charging-info_parameter }
		}
	4	TP_IMS_5118_01 in CFW step 12 (200 OK)
		ensure that {
		when { UE_B sends 200_response to UE_A }
		then { IMS_A receives the 200_response
		containing a P-Charging-Vector_header
		containing a orig-ioi_parameter
		indicating operator_identifier of IMS_A and
		containing a term-ioi_parameter
		indicating operator_identifier of IMS_B }
		}

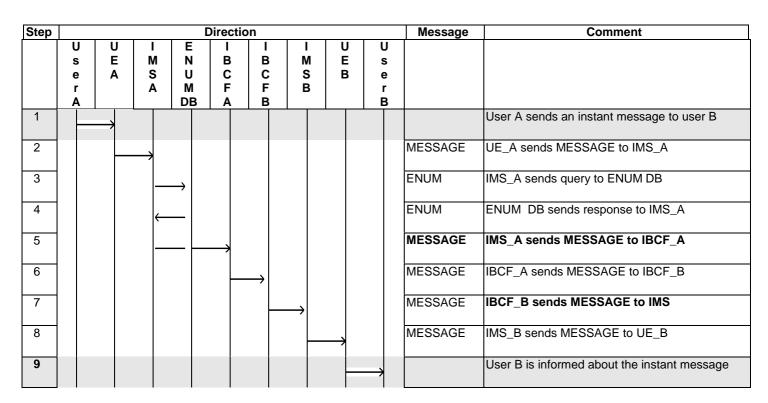
Step				D	irectio	n				Message	Comment
	U s e r A	U E A	I M S A	E N U M DB	I B C F A	I B C F B	M S B	U E B	U s e r B		
1		\rightarrow									User A sends an instant message to user B
2			\rightarrow							MESSAGE	UE_A sends MESSAGE to IMS_A
3				\rightarrow						ENUM	IMS_A sends query to ENUM DB
4			\leftarrow	_						ENUM	ENUM DB sends response to IMS_A
5				_	\rightarrow					MESSAGE	IMS_A sends MESSAGE to IBCF_A
6						\rightarrow				MESSAGE	IBCF_A sends MESSAGE to IBCF_B
7							\rightarrow			MESSAGE	IBCF_B sends MESSAGE to IMS

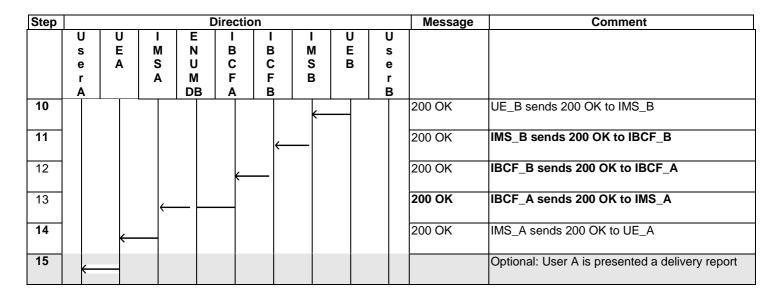


4.5.4.3 Messaging with TEL URI identities

	with TELLIDI identifies correctly											
	with TEL LIDI identities correctly											
OF INT OALL	IMS network handles messaging with TEL URI identities correctly											
CF_INT_CALL												
IMS_B												
Test Purpose	Specification Reference											
TP_IMS_5097_07	TS 124 229 [1], clause 5.4.3.2 ¶1											
TP_IMS_5117_02	TS 124 229 [1], clause 5.4.3.3 ¶100											
	(item 2 in 5 th numbered list)											
TP_IMS_5118_01	TS 124 229 [1], clause 5.4.3.3 ¶105											
	(item 2 in 6 th numbered list)											
TP_IMS_5117_06	TS 124 229 [1], clause 5.4.3.3 ¶100											
	(item 1 in 5 th numbered list)											
UC_05_I												
 HSS of IMS_A and of IMS B is 	configured according to table 1											
 UE_A and UE_B have IP bearers established to their respective IMS networks as 												
per clause 4.2.1												
 UE_A is registered in IMS_A u 	sing userTEL_priv according to table 1											
 UE_B is registered in IMS_B u 	sing userTEL_priv according to table 1											
 IMS_A is within the trust doma 	in of IMS_B											
 MESSAGE request and respor 	nse has to be supported at II-NNI (TS 129 165 [16]											
see Tables 6.1 and 6.3)												
Step												
	e to User B (i.e. userTEL in IMS_B)											
Verify that user B recei	ves message from user A											
	Test Purpose TP_IMS_5097_07 TP_IMS_5117_02 TP_IMS_5118_01 TP_IMS_5117_06 UC_05_I • HSS of IMS_A and of IMS B is • UE_A and UE_B have IP bear per clause 4.2.1 • UE_A is registered in IMS_A u • UE_B is registered in IMS_B u • IMS_A is within the trust doma • MESSAGE request and responsee Tables 6.1 and 6.3) Step 1 User A sends message											

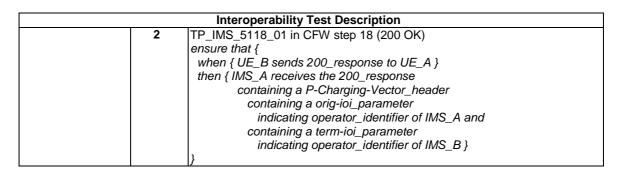
		Interoperability Test Description							
Conformance	Check								
Criteria:									
	1	TP_IMS_5097_07 in CFW step 6 (MESSAGE)							
		ensure that {							
		when { UE_A sends a MESSAGE to UE_B							
		}							
		then { IMS_B receives the MESSAGE							
		containing a P-Asserted-Identity_header							
		indicating the SIP_URI of UE_A and							
		containing a P-Asserted-Identity_header							
		indicating the Tel_URI of UE_A }							
		}							
	2	TP_IMS_5117_02 in CFW step 12 (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 }							
]							
	3	TP_IMS_5118_01 in CFW step 12 (200 OK)							
		ensure that {							
		when { UE_B sends 200_response to UE_A }							
		then { IMS_A receives the 200_response							
		containing a P-Charging-Vector_header							
		containing a orig-ioi_parameter							
		indicating operator_identifier of IMS_A and							
		containing a term-ioi_parameter							
		indicating operator_identifier of IMS_B }							
	4	TP_IMS_5117_06 in CFW step 12 (200 OK)							
	4	TP_IMS_5117_06 IT GFW step 12 (200 OK)							
		when { UE_B sends a 2xx_response to UE_A							
		Which { OL_D Schus a Zxx_response to OL_A							
		then { IMS_A receives the 2xx_response							
		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 }							
		1							

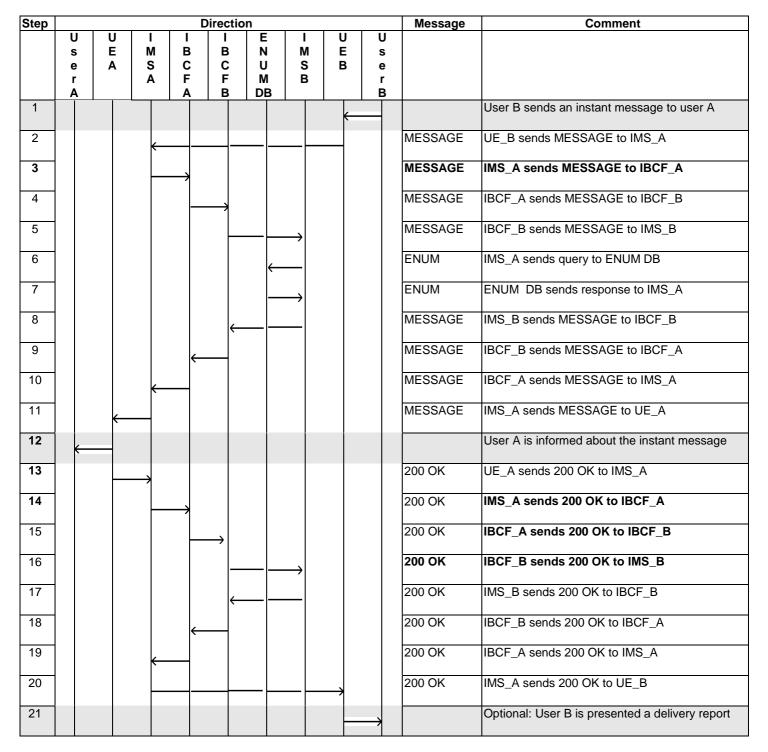




4.5.4.4 Messaging when roaming

		Interoperability Test Descr	rintion						
Identifier:									
Summary:	IMS network handles messaging while roaming correctly								
Configuration:	CF_ROAM_CALL								
SUT:	IMS_A and IMS_B								
References:	Test Purpose Specification Reference								
	TP_IMS_5	5108_02	TS 124 229 [1], clause 5.4.3.3 ¶5						
	TP_IMS_5	5118_01	TS 124 229 [1], clause 5.4.3.3 ¶105 (item 2 in 6 th numbered list)						
Use Case ref.:	UC_05_R								
Pre-test conditions:	 HSS of IMS_A and of IMS B is configured according to table 1 UE_A and UE_B have IP bearers established to their respective IMS networks as per clause 4.2.1 UE_A is registered in IMS_A using any user identity UE_B is registered in IMS_B via IMS_A using any user identity MESSAGE request and response has to be supported at II-NNI (TS 129 165 [16] see tables 6.1 and 6.3) 								
	Step								
Test Sequence:									
	1	User A sends message to user B Verify that user B receives message from user A							
	2								
	T								
Conformance	Check								
Criteria:									
	ensure that {								
	when { UE_A sends a MESSAGE to UE_B								
		IMS_A sends the MESSAGE to IMS_B							
		containing a P-Charging-Vector_header							
		containing an icid-value_parameter }							
	then { IMS_B sends the MESSAGE to IMS_A containing a Route_header not indicating the S-CSCF_SIP_URI of IMS_B and containing a P-Charging-Vector_header containing the same icid-value_parameter and not containing ioi_parameters								
1									
		containing a Record-Rout	te_header						
			te_header						





4.5.4.5 Messaging with receiving user not registered

	Interoperability	Test Description						
Identifier:	TD_IMS_MESS_0006							
Summary:	IMS network handles messaging correctly when receiving user is not registered							
Configuration:	CF_INT_CALL							
SUT:	IMS_B							
References:	Test Purpose	Specification Reference						
	TP_IMS_5114_02	TS 124 229 [1], clause 5.4.3.3 ¶85 (item 3 in 3 rd numbered list)						
Use Case ref.:	UC_05_I	(Notes of the Control						
Pre-test conditions:	 HSS of IMS_A and of IMS B is configured according to table 1 UE_A and UE_B have IP bearers established to their respective IMS networks as per clause 4.2.1 UE_A is registered in IMS_A using any user identity UE_B is not registered in IMS_B IMS_B is not configured with any filter criteria to contact "any AS" MESSAGE request and response has to be supported at II-NNI (TS 129 165 [16] see tables 6.1 and 6.3) 							
Test Sequence:		ge to a valid user B identity nformed that user B could not be reached						
Conformance	Check							
Criteria:	ensure that { when { UE_A sends the	CFW step 12 (4xx Response) s a MESSAGE to UE_B and the MESSAGE to IMS_B } s a 4xx_response to IMS_A						

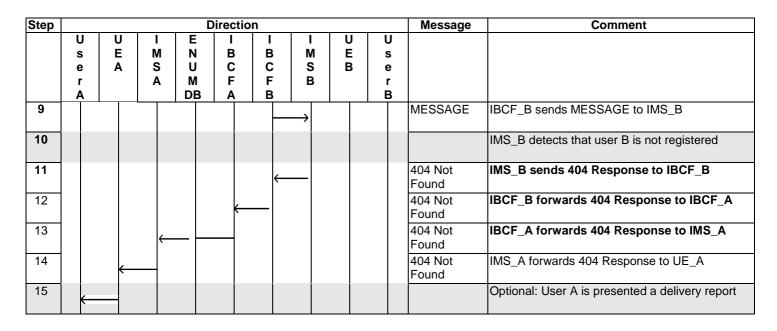
Step		Direction							Message	Comment	
	U s e r A	U E A	I M S A	E N U M DB	I B C F A	I B C F B	I M S B	U E B	U s e r B		
1		\rightarrow									User A sends an instant message to user B
2		\vdash	\rightarrow							MESSAGE	UE_A sends MESSAGE to IMS_A
3			_	\rightarrow						ENUM	IMS_A sends query to ENUM DB
4			\leftarrow	_						ENUM	ENUM DB sends response to IMS_A
5			_	_ _	\rightarrow					MESSAGE	IMS_A sends MESSAGE to IBCF_A
7						\longrightarrow				MESSAGE	IBCF_A sends MESSAGE to IBCF_B
9						_	\longrightarrow			MESSAGE	IBCF_B sends MESSAGE to IMS_B
10											IMS_B detects that user B is not registered
11						←				4xx Response	IMS_B sends 4xx Response to IBCF_B
12					(4xx Response	IBCF_B forwards 4xx Response to IBCF_A
13			\leftarrow	_						4xx Response	IBCF_A forwards 4xx Response to IMS_A
14		←								4xx Response	IMS_A forwards 4xx Response to UE_A

Step				C	irectio	n			Message	Comment	
	C	U	ı	Е	ı	ı	I	U	U		
	s	Е	M	N	В	В	M	E	s		
	е	Α	S	U	С	С	S	В	е		
	r		Α	M	F	F	В		r		
	Α			DB	Α	В			В		
15	\leftarrow	K									Optional: User A is presented a delivery report

4.5.4.6 Messaging with receiving user barred

	Interoperability Tes	t Description										
Identifier: TD_IMS_MESS_0007												
Summary:		rectly when receiving user has been barred										
Configuration:	CF INT CALL	when receiving user has been barred										
SUT:	IMS_B											
References:	Test Purpose	Specification Reference										
T. C.	TP_IMS_5108_06	TS 124 229 [1], clause 5.4.3.3 ¶6 (item 1 in1st numbered list)										
Use Case ref.:	UC 05 I											
Pre-test conditions:	1100 of time_7 tand of time B to configured according to table 1											
Test Sequence:	Step 1 User A sends message to 2 Verify that user A is inform	User B ned that user B could not be reached										
Conformance	Check											
TP_IMS_5108_06 in CFW step 12 (404 Response) ensure that { when { UE_A sends a MESSAGE to UE_B and IMS_A sends the MESSAGE to IMS_B containing a Request_URI indicating a barred_user in IMS_B } then { IMS_B sends 404_response to IMS_A } }												

Step				C	Directio	n				Message	Comment
	U s e r A	U E A	M S A	E N U M DB	I B C F A	I B C F B	I M S B	UEB	U s e r B		
1		\rightarrow									User A sends an instant message to user B
2			\rightarrow							MESSAGE	UE_A sends MESSAGE to IMS_A
3			_	\rightarrow						ENUM	IMS_A sends query to ENUM DB
4			\leftarrow	_						ENUM	ENUM DB sends response to IMS_A
5			_	_ _	\longrightarrow					MESSAGE	IMS_A sends MESSAGE to IBCF_A
7						\rightarrow				MESSAGE	IBCF_A sends MESSAGE to IBCF_B

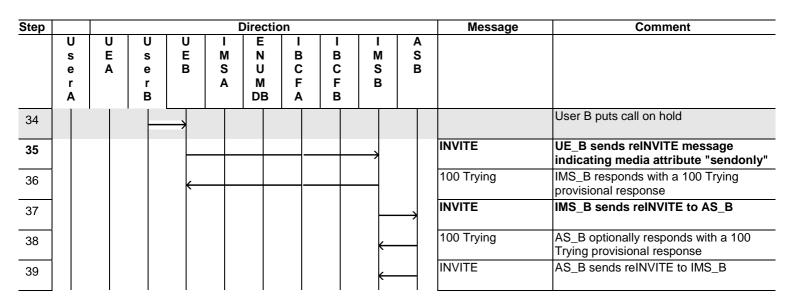


4.5.5 Supplementary Services

4.5.5.1 Supplementary Service HOLD with AS

		Interoperability Tes	t Description								
Identifier:	TD_IMS_	SS_0001									
Summary:			cation services based on the example of the HOLD								
		entary service									
Configuration:	CF_INT_	AS									
SUT:	IMS_B										
References:	Test Pur		Specification Reference								
	TP_IMS_		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										
Use Case ref.:	UC_10_I										
Pre-test	• HSS	of IMS_A and of IMS B is	configured according to table 1								
conditions:	 UE_ 	A and UE_B have IP beare	rs established to their respective IMS networks as								
	per	clause 4.2.1									
	 UE_ 	_A is registered in IMS_A us	ing any user identity								
	 UE_ 	B is registered in IMS_B us	ing userHOLD identity according to table 1								
	 IMS 	_B is configured to contact	AS_B (HOLD)								
	 UE_ 	B is subscribed to HOLD se	ervice								
	• ASI	B in same trust domain as II	MS B								
Test Sequence:	Step										
	1	User A calls User B (i.e. u									
	2	Verify that user B is inform	ned of incoming call of User A								
	3	Verify that user A is inforn	ned that UE_B is ringing								
	4	User B answers call									
	5		ned that call has been answered								
	6		ned that call is established								
	7	User B puts call on hold									
	8	Verify that user A is inform	ned that call on hold with AS tone								
	9	Verify that user B is inforn	ned that call on hold								
	10	User B resumes call									
	11	Verify that user A is inform									
	12	Verify that user B is inform	ned that call is resumed								
	13	User A ends call									
	14	Verify that user B is inform									
	15	Verify that user A is inform	ned that call has ended								

		Interoperability Test Description
Conformance	Check	
Criteria:	1	TP_IMS_5310_01 in CFW step 37 (INVITE)
		ensure that {
		when { UE_B sends a subsequent INVITE to IMS_B
		containing a P-Charging-Vector_header
		containing an access-network-charging-info_parameter
		then { IMS_B sends the INVITE to AS_B
		containing a P-Charging-Vector_header
		containing an access-network-charging-info_parameter
		}
	2	TP_IMS_5312_01 in CFW step 52 and Step 54 (200 OK) ensure that {
		when { IMS_B receives a 200_response from IMS_A
		containing a P-Charging-Vector_header
		containing an access-network-charging-info_parameter
		then { IMS_B sends the 200_response to AS_B
		containing a P-Charging-Vector_header
		containing a access-network-charging-info_parameter
		}
	3	TP_IMS_5310_01 in CFW step 65 (INVITE)
		ensure that {
		when { UE_B sends a subsequent INVITE to IMS_B
		containing a P-Charging-Vector_header
		containing an access-network-charging-info_parameter
		then { IMS_B sends the INVITE to AS_B
		containing a P-Charging-Vector_header
		containing an access-network-charging-info_parameter
		}
	4	TP_IMS_5312_01 in CFW step 80 and Step 82 (200 OK)
	_	ensure that {
		when { IMS_B receives a 200_response from IMS_A
		containing a P-Charging-Vector_header
		containing an access-network-charging-info_parameter
		then { IMS_B sends the 200_response to AS_B
		containing a P-Charging-Vector_header
		containing a recess-network-charging-info_parameter
		}
]}



Step						Directio	on .				Message	Comment
	U s e r A	U E A	U s e r B	U E B	I M S A	E N U M DB	I B C F A	I B C F B	I M S B	В		
40										\longrightarrow	100 Trying	IMS_B responds with a 100 Trying provisional response
41								•			INVITE	IMS_B forwards reINVITE to IBCF_B
42											100 Trying	IBCF_B responds with a 100 Trying provisional response
43							←				INVITE	IBCF_B forwards reINVITE to IBCF_A
44							_	\longrightarrow			100 Trying	IBCF_A responds with a 100 Trying provisional response
45					\leftarrow						INVITE	IBCF_A forwards reINVITE to IMS_A
46							\rightarrow				100 Trying	IMS_A responds with a 100 Trying provisional response
47		←			-						INVITE	IMS_A forwards reINVITE to UE_A
48					\rightarrow						100 Trying	UE _A optionally responds with a 100 Trying provisional response
49	←	-										User A is informed that call is on hold with AS tone
50					\rightarrow						200 OK	UE_A responds to reINVITE with 200 OK indicating media attribute "recvonly"
51							\rightarrow				200 OK	IMS_A forwards 200 OK response to IBCF_A
52								\longrightarrow			200 OK	IBCF_A forwards 200 OK response to IBCF_B
53								_	\longrightarrow		200 OK	IBCF_B forwards 200 OK response to IMS_B
54										\longrightarrow	200 OK	IMS_B forwards 200 OK response to AS_B
55									•		200 OK	AS_B forwards 200 OK response to IMS_B
56				\leftarrow		_					200 OK	IMS_A forward the 200 OK to UE_B
57			—									User B is informed that the call is on hold
58					+				\longrightarrow		ACK	UE_B acknowledges the receipt of 200 OK for reINVITE
59										\longrightarrow	ACK	IMS_B forwards ACK to AS_B
60									•	, ·	ACK	AS_B forwards ACK to IMS_B
61						_					ACK	IMS_B forwards ACK to UE_B
62				\rightarrow								User B resumes call
63											INVITE	UE_B sends second reINVITE message indicating media attribute
64						-	_				100 Trying	IMS_B responds with a 100 Trying provisional response
65										\longrightarrow	INVITE	IMS_B sends reINVITE to AS_B
66									•		100 Trying	AS_B optionally responds with a 100 Trying provisional response
67									•		INVITE	AS_B forwards INVITE to IMS_B

Step					[Directio	n				Message	Comment
	U s e r A	U E A	U s e r B	U E B	M S A	E N U M DB	I B C F A	B C F B	M S B	A S B		
68										\rightarrow	100 Trying	IMS_B responds with a 100 Trying provisional response
69								←			INVITE	IMS_B sends reINVITE to IBCF_B
70									\longrightarrow		100 Trying	IBCF_B responds with a 100 Trying provisional response
71							←				INVITE	IBCF_B sends reINVITE to IBCF_A
72								\longrightarrow			100 Trying	IBCF_A responds with a 100 Trying provisional response
73											INVITE	IBCF_A sends reINVITE to IMS_A
74							\longrightarrow				100 Trying	IMS_A responds with a 100 Trying provisional response
75		\leftarrow			_						INVITE	IMS_A forwards reINVITE to UE_A
76					\longrightarrow						100 Trying	UE_A optionally responds with a 100 Trying provisional response
77	—	+										User A is informed that call is resumed
78		H			\rightarrow						200 OK	UE_A sends the 200 OK indicating media attribute "sendrecv" to IMS_A
79							\rightarrow				200 OK	IMS_A forwards 200 OK response to IBCF_A
80								\longrightarrow			200 OK	IBCF_A forwards 200 OK response to IBCF_B
81									\longrightarrow		200 OK	IBCF_B forwards 200 OK response to IMS_B
82										\longrightarrow	200 OK	IMS_B forwards 200 OK response to AS_B
83									←		200 OK	AS_B forwards the 200 OK for INVITE
84				←							200 OK	IMS_B forwards 200 OK to UE_B
85			(User B is informed that call is resumed

4.5.5.2 Supplementary Service HOLD with AS in roaming

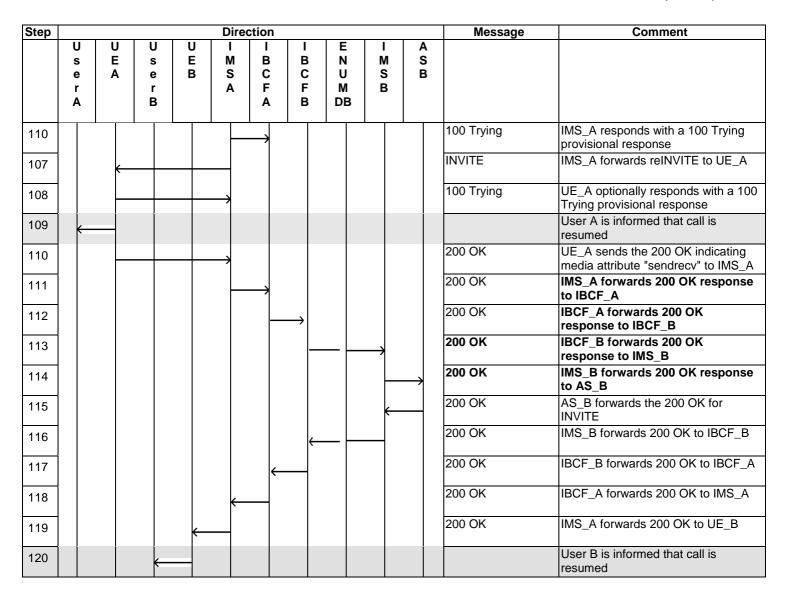
		Interoperability Test Des	cription										
Identifier:	TD_IMS_												
Summary:			services based on the example of the HOLD										
		ntary service											
Configuration:	CF_ROAI	M_AS											
SUT:	IMS_B												
References:		Test Purpose Specification Reference											
		P_IMS_5310_01 TS 124 229 [1], clause 5.4.6.1.2 ¶1											
	TP_IMS_	P_IMS_5312_01 TS 124 229 [1], clause 5.4.6.1.3 ¶1											
Use Case ref.:	UC_10_R												
Pre-test		of IMS_A and of IMS B is configur											
conditions:			olished to their respective IMS networks as										
		ause 4.2.1											
		is registered in IMS_A using any											
			using userHOLD identity according to										
	table 1												
		B is configured to contact AS_B (I	HOLD)										
	_	is subscribed to HOLD service											
	AS B i	in same trust domain as IMS B											
	1 -												
Test Sequence:	Step												
	1	User A calls User B (i.e. userHC	<u> </u>										
	2	Verify that user B is informed of											
	3	Verify that user A is informed th	at UE_B is ringing										
	4	User B answers call											
	5	Verify that user A is informed th											
	6	Verify that user B is informed th	at call is established										
	7	User B puts call on hold											
	8	Verify that user A is informed th											
	9	Verify that user B is informed th	at call on hold										
	10	User B resumes call											
	11	Verify that user A is informed th											
	12	Verify that user B is informed th	at call is resumed										
	1 40	User A ends call											
	13												
	13 14 15	Verify that user B is informed the Verify that user A is informed the Verify that user B is informed the Verify that user											

		Interoperability Test Description
Conformance	Check	
Criteria:	1	TP_IMS_5310_01 in CFW step 54 and Step 58 (INVITE) ensure that { when { UE_B sends a subsequent INVITE to IMS_B
	2	TP_IMS_5312_01 in CFW step 73 and Step 75 (200 OK) ensure that { when { IMS_B receives a 200_response from IMS_A
	3	TP_IMS_5310_01 in CFW step 95 and Step 101 (INVITE) ensure that { when { UE_B sends a subsequent INVITE to IMS_B
	4	TP_IMS_5312_01 in CFW step 112 and Step 114 (200 OK) ensure that { when { IMS_B receives a 200_response from IMS_A

Step					Direc	tion					Message	Comment
	U s e r A	U E A	U s e r B	UEB	I M S A	I B C F A	- B C F B	E N U M DB	I M S B	A S B		
49												User B puts call on hold
50					\rightarrow						INVITE	UE_B sends reINVITE message indicating media attribute
51				←							100 Trying	IMS_A responds with a 100 Trying provisional response
52						\rightarrow					INVITE	IMS_A forwards INVITE to IBCF_A
53					(100 Trying	IBCF_A responds with a 100 Trying provisional response

Step					Dire	ction					Message	Comment
	U s e r A	U E A	U s e r B	U E B	I M S A	I B C F A	I B C F B	E N U M DB	M S B	A S B		
54							\longrightarrow				INVITE	IBCF_A forwards INVITE to IBCF_B
55						←					100 Trying	IBCF_B responds with a 100 Trying provisional response
56							_		\longrightarrow		INVITE	IBCF_B forwards INVITE to IMS_B
57							←				100 Trying	IMS_B responds with a 100 Trying provisional response
58									-	→	INVITE	IMS_B sends reINVITE to AS_B
59									←		100 Trying	AS_B optionally responds with a 100 Trying provisional response
60									(INVITE	AS_B sends reINVITE to IMS_B
61									-	\longrightarrow	100 Trying	IMS_B responds with a 100 Trying provisional response
62							←				INVITE	IMS_B forwards reINVITE to IBCF_B
63							_		→		100 Trying	IBCF_B responds with a 100 Trying provisional response
64						←					INVITE	IBCF_B forwards reINVITE to IBCF_A
65							\longrightarrow				100 Trying	IBCF_A responds with a 100 Trying provisional response
66					←						INVITE	IBCF_A forwards reINVITE to IMS_A
67						→					100 Trying	IMS_A responds with a 100 Trying provisional response
68		←									INVITE	IMS_A forwards reINVITE to UE_A
69					\rightarrow						100 Trying	UE _A optionally responds with a 100 Trying provisional response
70	←											User A is informed that call is on hold with AS tone
71		-	-		\rightarrow						200 OK	UE_A responds to reINVITE with 200 OK indicating media attribute
72						\longrightarrow					200 OK	IMS_A forwards 200 OK response to IBCF_A
73							\longrightarrow				200 OK	IBCF_A forwards 200 OK response to IBCF_B
74							_		\longrightarrow		200 OK	IBCF_B forwards 200 OK response to IMS_B
75									-	\longrightarrow	200 OK	IMS_B forwards 200 OK response to AS_B
76									(200 OK	AS_B forwards 200 OK response to IMS_B
77							←				200 OK	IMS_B forwards 200 OK response to IBCF_B
78						\leftarrow					200 OK	IBCF_B forwards 200 OK response to IBCF_A
79					←						200 OK	IBCF_A forwards 200 OK response to IMS_A
80				(200 OK	IMS_A forward the 200 OK to UE_B
81			←									User B is informed that the call is on hold

Step					Direc	tion					Message	Comment
	U s	U E	U s	U E	I M	I B	I B	E N	I M	A S		
	e r	Α	e r	В	S A	C F	C F	U M	S B	В		
	Α		В			Α	В	DB				
82					\rightarrow						ACK	UE_B acknowledges the receipt of 200 OK for reINVITE
83						\rightarrow					ACK	IMS_A forwards ACK to IBCF_A
84						_	\rightarrow				ACK	IBCF_A forwards ACK to IBCF_B
85								_	\rightarrow		ACK	IBCF_A forwards ACK to IMS_B
86										\rightarrow	ACK	IMS_B forwards ACK to AS_B
87									(ACK	AS_B forwards ACK to IMS_B
88							\leftarrow	_			ACK	IMS_B forwards ACK to IBCF_B
89						←					ACK	IBCF_B forwards ACK to IBCF_A
90					←						ACK	IBCF_A forwards ACK to IMS_A
91				←							ACK	IMS_A forwards ACK to UE_B
92				\rightarrow								User B resumes call
93					\rightarrow						INVITE	UE_B sends second relNVITE message indicating media
94				(100 Trying	IMS_A responds with a 100 Trying provisional response
95						\rightarrow					INVITE	IMS_A sends reINVITE to IBCF_A
96					←						100 Trying	IBCF_A responds with a 100 Trying provisional response
97							\rightarrow				INVITE	IBCF_A sends reINVITE to IBCF_B
98						←					100 Trying	IBCF_B responds with a 100 Trying provisional response
99								_	\rightarrow		INVITE	IBCF_B sends reINVITE to IMS_B
100							\leftarrow	_			100 Trying	IMS_B responds with a 100 Trying provisional response
101										\rightarrow	INVITE	IMS_B sends reINVITE to AS_B
102									├		100 Trying	AS_B optionally responds with a 100 Trying provisional response
103									K		INVITE	AS_B forwards INVITE to IMS_B
104										\longrightarrow	100 Trying	IMS_B responds with a 100 Trying provisional response
105							←	_			INVITE	IMS_B sends reINVITE to IBCF_B
106									\rightarrow		100 Trying	IBCF_B responds with a 100 Trying provisional response
107						←					INVITE	IBCF_B forwards reINVITE to IBCF_A
108							\longrightarrow				100 Trying	IBCF_A responds with a 100 Trying
109					←						INVITE	provisional response IBCF_A forwards reINVITE to IMS_A
					*							



4.5.5.3 Supplementary Service OIP with AS

TD_IMS_SS_0003											
TD_IMS_SS_0003											
IMS network supports properly application services based on the example of the OIP supplementary service											
CF_INT_AS											
IMS_A and IMS_B											
Test Purpose	Specification Reference										
TP_IMS_5097_02	TS 124 229 [1], clause 5.4.3.2 ¶11 (item 9 in 1 st numbered list)										
TP_IMS_5108_03	TS 124 229 [1], clause 5.4.3.3 ¶5 (item 4 in 1 st numbered list)										
TP_IMS_5115_08	TS 124 229 [1], clause 5.4.3.3 ¶89 (4 th numbered list)										
UC_08_I											
 HSS of IMS_A and of IMS B is configured according to table 1 UE_A and UE_B have IP bearers established to their respective IMS networks as per clause 4.2.1 UE_A is registered in IMS_A using any user identity UE_B is registered in IMS_B using userOIP identity according to table 1 IMS_B is configured to contact AS_B (OIP) UE_B is subscribed to OIP service 											
	supplementary service CF_INT_AS IMS_A and IMS_B Test Purpose TP_IMS_5097_02 TP_IMS_5108_03 TP_IMS_5115_08 UC_08_I HSS of IMS_A and of IMS B is configulation of the service of th										

		Interoperability Test Description
Test Sequence:	Step	
	1	User A calls User B (i.e. userOIP in IMS_B)
	2	Verify that user B is informed of incoming call of User A, user A's identity is
		displayed
	3	Verify that user A is informed that UE_B is ringing
	4	User B answers call
	5	Verify that user A is informed that call has been answered
	6	Verify that user B is informed that the call is established
	7	User A ends call
	8	Verify that user B is informed that call has ended
	9	
	9	Verify that user A is informed that call has ended
Conformance	Check	
Criteria:	1	TP_IMS_5097_02 in CFW step 8 (INVITE)
oniteria.		
		ensure that {
		when { IMS_A receives an initial INVITE from UE_A addressed to UE_B
		then (IMC A sounds the initial IMM/ITE to IMC D
		then { IMS_A sends the initial INVITE to IMS_B
		containing a P-Asserted-Identity_header
		indicating the SIP_URI of UE_A
		and
		containing a P-Asserted-Identity_header
		indicating the Tel_URI of UE_A }
	2	TP_IMS_5108_03 in CFW step 12 (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 32 (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 }
	1	<u> </u>

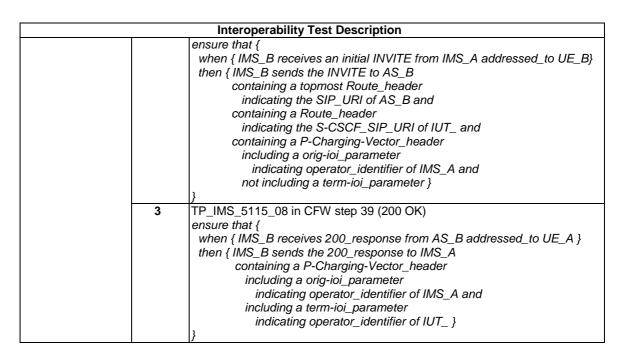
Step					Dire	ction						Message	Comment
	U	U	U	U	-	Е	1	ı	I	-	4		
	s	E	s	E	M	N	В	В	M	\$	3		
	е	Α	е	В	S	U	С	С	S	_	3		
	r		r		Α	M	F	F	В				
	Ą		В			DB	Α	В					
1		\rightarrow											User A calls User B
2		H			\rightarrow							INVITE	UE_A sends INVITE with the first SDP offer indicating all desired media and codecs that
3		\leftarrow										100 Trying	IMS_A responds with a 100 Trying provisional response
4						\rightarrow						ENUM	IMS_A sends query to ENUM DB
5					←							ENUM	ENUM DB sends response to IMS

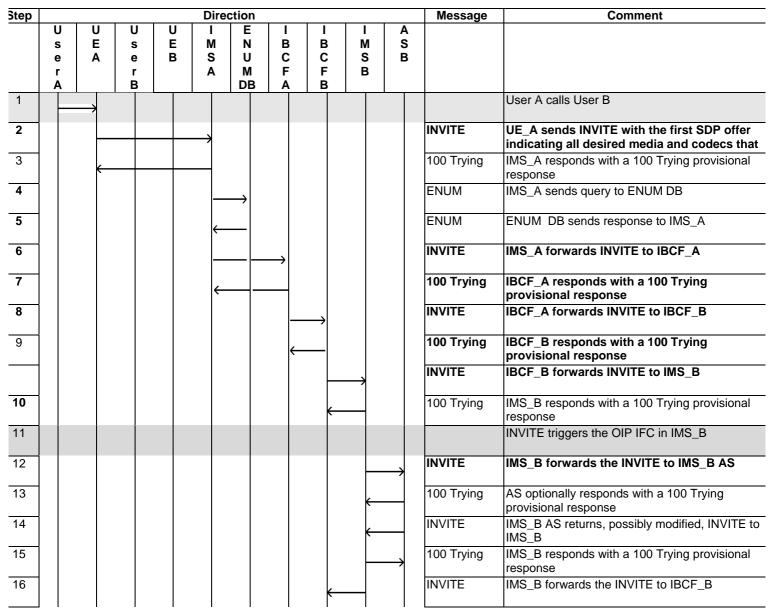
Note	Step				Di	rection					Message	Comment
Repair to the second of the se				_	I	l l	I B	I B	I M			
INVITE MS. A forwards INVITE to IBCF. A 100 Trying BCF_A responds with a 100 T		е	A e	В	S	U	С	С	S			
Too Trying IBCF A responds with a 100 Trying provisional response INVITE IBCF B forwards INVITE to IBCF B INVITE IBCF B forwards	6										INIVITE	IMS A fewwards INVITE to IDSS A
B INVITE IBCF_A forwards INVITE to IBCF_B IBCF_B forwards INVITE to IBCF_B IBCF_B forwards INVITE to IMS_B IBCF_B forwards INVITE to IMS_B IBCF_B forwards INVITE to IMS_B INVITE IMS_B forwards the INVITE to IMS_B INVITE IMS_B forwards the INVITE to IMS_B INVITE IMS_B forwards the INVITE IMS_B forwards InvITE InvITE IMS_B forwards InvITE InvITE IMS_B forwards InvITE InvITE ImS_B forwards InvITE InvITE InvITE ImS_B forwards InvITE InvITE InvITE ImS_B forwards InvITE Inv	•						\longrightarrow					
100 Trying BCF B responds with a 100 Trying provisional response NVITE BCF B forwards INVITE to IMS B 100 Trying provisional response INVITE triggers the OIP IFC in IMS_B AS Invite IMS_B forwards the INVITE to IMS_B AS Invite Invite IMS_B forwards the Invite Invite Invite Invite Invite Ims_B forwards Invite In					ŀ							provisional response
Invite I	8						_	\longrightarrow			INVITE	IBCF_A forwards INVITE to IBCF_B
100 Trying	9						←				100 Trying	
INVITE IMS_B forwards the INVITE to IMS_B AS INVITE IMS_B forwards the INVITE to IMS_B AS INVITE IMS_B forwards the INVITE to IMS_B AS INVITE IMS_B AS returns, possibly modified, INVITE to IMS_B AS returns, possibly modified, INVITE to IMS_B AS returns, possibly modified, INVITE to IMS_B B AS returns, possibly modified, INVITE to IMS_B INVITE to IMS_B forwards the INVITE to UE_B INVITE IMS_B forwards the INVITE with 180 Ringing forwards the Invite with 180 Ringing in UE_B responds to initial INVITE with 180 Ringing IMS_B AS forwards 180 Ringing response to IMS_B AS forwards 180 Ringing response to IMS_B AS forwards the 180 Ringing response to IMS_B AS forwards the 180 Ringing response to IMS_B AS forwards the 180 Ringing response to UE_A INVITE IMS_B forwards the 180 Ringing response to IMS_B AS forwards the 180 Ringing response to IMS_B AS forwards the 180 Ringing response to IMS_B AS forwards the 180 Ringing response to UE_A INVITE IMS_B forwards the 180 Ringing response to IMS_B AS forwards the 180 Ringing response to IMS_B Ringing IMS_B forwards 200 OK response to IMS_B AS forwards 200 OK response to IMS_B Forwards 200 OK response to IMS_B Ringing IMS_B Ringinging IMS_B Ringingingingingingingingingingingingingi									→		INVITE	IBCF_B forwards INVITE to IMS_B
12 INVITE IMS_B forwards the INVITE to IMS_B AS 100 Trying AS optionally responds with a 100 Trying provisional response INVITE to IMS_B AS returns, possibly modified, INVITE to IMS_B AS returns, possibly modified, INVITE to IMS_B as provisional response INVITE IMS_B invariant in 100 Trying IMS_B responds with a 100 Trying provisional response INVITE IMS_B invariant in 100 Trying INVITE IMS_B invariant in 100 Trying INVITE IMS_B informed of incoming call of User A, User As identity is displayed 180 Ringing UE_B response to initial INVITE with 180 Ringing to indicate that it has started alerting 180 Ringing IMS_B AS forwards the 180 Ringing response to IMS_B AS 180 Ringing IMS_B AS forwards the 180 Ringing response to IMS_B AS 180 Ringing IMS_B AS forwards the 180 Ringing response to IMS_B AS 180 Ringing IMS_B AS forwards the 180 Ringing response to IMS_B AS 180 Ringing IMS_B AS forwards the 180 Ringing response to IMS_B AS 180 Ringing IMS_B AS forwards the 180 Ringing response to IMS_B AS 180 Ringing IMS_B AS forwards the 180 Ringing response to IMS_B AS 180 Ringing IMS_B AS forwards the 180 Ringing response to IMS_B AS 180 Ringing IMS_B AS forwards the 180 Ringing response to IMS_B AS 180 Ringing IMS_B AS forwards the 180 Ringing response to IMS_B AS 180 Ringing IMS_B AS forwards the 180 Ringing response to IMS_B AS 180 Ringing IMS_B AS forwards 200 OK response to IMS_B AS 200 OK IMS_B AS forwards 200 OK response to IMS_B AS 200 OK IMS_B AS forwards 200 OK response to IMS_B AS 200 OK IMS_B AS forwards 200 OK response to IMS_B AS 200 OK IMS_B AS forwards 200 OK response to IMS_B AS 200 OK IMS_B AS forwards 200 OK response to IMS_B AS 200 OK IMS_B AS forwards 200 OK response to IMS_B AS 200 OK IMS_B AS forwards 200 OK response to IMS_B AS 200 OK IMS_B AS forwards 200 OK response to IMS_B AS 200 OK IMS_B AS forwards 200 OK response to IMS_B AS 200 OK IMS_B AS forwards 200 OK response to IMS_B	10							←			100 Trying	
13	11											INVITE triggers the OIP IFC in IMS_B
Invite I	12									→	INVITE	IMS_B forwards the INVITE to IMS_B AS
IMS_B INS_B INS_	13								+		100 Trying	
Invite Invite Ims_B forwards the Invite to UE_B	14								*			
100 Trying UE_B optionally responds with a 100 Trying provisional response User B is informed of incoming call of User A, User A's identity is displayed 180 Ringing UE_B responds to initial INVITE with 180 Ringing in UE_B responds to initial INVITE with 180 Ringing in IMS_B AS forwards 180 Ringing response to IMS_B AS forwards 180 Ringing response to IMS_B AS forwards 180 Ringing response to IBCF_B 180 Ringing IMS_B AS forwards 180 Ringing response to IBCF_B 180 Ringing IMS_B forwards the 180 Ringing response to IBCF_A 180 Ringing IBCF_A forwards the 180 Ringing response to IBCF_A 180 Ringing IBCF_A forwards the 180 Ringing response to IBCF_A 180 Ringing IMS_A forwards the 180 Ringing response to IBCF_A 180 Ringing IMS_A forwards the 180 Ringing response to IBCF_A 180 Ringing IMS_A forwards the 180 Ringing response to IBCF_A 180 Ringing IMS_A forwards the 180 Ringing response to IBCF_A 180 Ringing IMS_A forwards the 180 Ringing response to IBCF_A 180 Ringing IMS_B AS forwards 200 CK to indicate that the call has been answered 200 OK IMS_B rowards 200 OK response to IMS_B AS 200 OK IMS_B forwards 200 OK response to IMS_B AS 200 OK IMS_B forwards the 200 OK response to IBCF_B 180 OK IMS_B forwards the 200 OK response to IBCF_B 180 OK IMS_B forwards the 200 OK response to IBCF_B										\longrightarrow		response
provisional response User B is informed of incoming call of User A, User A's identity is displayed 19 180 Ringing UE_B responds to initial INVITE with 180 Ringing response to initial INVITE with 180 Ringing in IMS_B forwards 180 Ringing response to ims_B AS 180 Ringing IMS_B AS forwards 180 Ringing response to IMS_B AS 180 Ringing IMS_B forwards the 180 Ringing response to IMS_B Ringing IBCF_B forwards the 180 Ringing response to IBCF_A 180 Ringing IBCF_B forwards the 180 Ringing response to IBCF_A 180 Ringing IMS_A forwards the 180 Ringing response to IMS_B A forwards the 180 Ringing response to IMS_B forwards 200 OK to indicate that the call has been answered 200 OK UE_B responds INVITE with 200 OK to indicate that the call has been answered 200 OK IMS_B AS forwards 200 OK response to IMS_B AS 200 OK IMS_B Forwards 200 OK response to IMS_B AS 200 OK IMS_B Forwards 200 OK response to IMS_B Forwards 200 OK IMS_B Forwards 200 OK response to IMS_B Forwards 200 OK IMS_B Forwards 200 OK response to IMS_B Forwards 200 OK IMS_B Forwards 200 OK response to IMS_B Forwards 200 OK IMS_B Forwards 200 OK response to IMS_B Forwards 200 OK IMS_B Fo	16			+			— -				INVITE	IMS_B forwards the INVITE to UE_B
User A's identity is displayed 19 180 Ringing 180 Ringing indicate that it has started alerting 180 Ringing in indicate that it has started alerting 180 Ringing in limits 180 Ringing response to 180 Ringing 180 Ringing 180 Ringing 180 Ringing 180 Ringing 180 Ringing response to 180 Ringing 180 Ringing	17										100 Trying	UE_B optionally responds with a 100 Trying provisional response
180 Ringing UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting 180 Ringing in to indicate that it has started alerting 180 Ringing in to indicate that it has started alerting 180 Ringing in IMS_B AS forwards 180 Ringing response to IMS_B AS [180 Ringing] IMS_B AS forwards 180 Ringing response to IMS_B Ringing IMS_B AS forwards the 180 Ringing response to IBCF_B [180 Ringing] IBCF_A forwards the 180 Ringing response to IBCF_A forwards the 180 Ringing response to IMS_A Ringing IMS_A forwards the 180 Ringing response to UE_A [180 Ringing] IMS_A forwards the 180 Ringing response to UE_A [180 Ringing] IMS_A forwards the 180 Ringing response to UE_A [180 Ringing] IMS_A forwards the 180 Ringing response to UE_A [180 Ringing] IMS_A forwards the 180 Ringing response to UE_A [180 Ringing] IMS_A forwards the 180 Ringing response to UE_A [180 Ringing] IMS_A forwards the 180 Ringing response to UE_A [180 Ringing] IMS_A forwards the 180 Ringing response to UE_A [180 Ringing] IMS_A forwards the 180 Ringing response to UE_A [180 Ringing] IMS_A forwards the 180 Ringing response to UE_A [180 Ringing] IMS_A forwards the 180 Ringing response to UE_A [180 Ringing] IMS_A forwards the 180 Ringing response to UE_A [180 Ringing] IMS_A forwards the 180 Ringing response to UE_A [180 Ringing] IMS_A forwards the 180 Ringing response to UE_A [180 Ringing] IMS_A forwards the 180 Ringing response to UE_A [180 Ringing] IMS_A forwards the 180 Ringing response to UE_A [180 Ringing] IMS_B forwards the 180 Ringing response to UE_A [180 Ringing] IMS_B forwards the 180 Ringing response to UE_A [180 Ringing] IMS_B forwards the 180 Ringing response to UE_A [180 Ringing] IMS_B forwards the 180 Ringing response to UE_A [180 Ringing] IMS_B forwards the 180 Ringing response to UE_A [180 Ringing] IMS_B forwards the 180 Ringing response to UE_A [180 Ringing] IMS_B forwards the 180 Ringing IMS_B fo	18			<u>. </u>								
IMS_B AS 180 Ringing IMS_B AS forwards 180 Ringing response to IMS_B AS 180 Ringing IMS_B forwards the 180 Ringing response to IBCF_B 180 Ringing IBCF_B forwards the 180 Ringing response to IBCF_A 180 Ringing IBCF_A forwards the 180 Ringing response to IMS_A 180 Ringing IMS_A forwards the 180 Ringing response to IMS_A 180 Ringing IMS_A forwards the 180 Ringing response to IMS_A 180 Ringing IMS_A forwards the 180 Ringing response to IMS_A 180 Ringing IMS_A forwards the 180 Ringing response to IMS_B 180 Ringing IMS_A forwards the 180 Ringing response to IMS_B 180 Ringing 180 Ringin	19			-							180 Ringing	UE_B responds to initial INVITE with 180
IMS_B	20									\longrightarrow	180 Ringing	
BCF_B	21								+		180 Ringing	
BCF_A	22							(180 Ringing	
IMS_A	23						←				180 Ringing	
USER A is informed that UE_B is ringing USER B answers call USER B responds INVITE with 200 OK to indicate that the call has been answered 200 OK IMS_B forwards 200 OK response to IMS_B AS 200 OK IMS_B AS forwards 200 OK response to IMS_B 200 OK IMS_B forwards the 200 OK response to IBCF_B 200 OK IBCF_B forwards the 200 OK response to	24					←						
User B answers call 200 OK UE_B responds INVITE with 200 OK to indicate that the call has been answered 200 OK IMS_B forwards 200 OK response to IMS_B AS 200 OK IMS_B AS forwards 200 OK response to IMS_B AS 200 OK IMS_B forwards the 200 OK response to IBCF_B 200 OK IBCF_B forwards the 200 OK response to	25										180 Ringing	
28 29 200 OK UE_B responds INVITE with 200 OK to indicate that the call has been answered 200 OK IMS_B forwards 200 OK response to IMS_B AS 200 OK IMS_B AS forwards 200 OK response to IMS_B 200 OK IMS_B forwards the 200 OK response to IBCF_B 200 OK IBCF_B forwards the 200 OK response to	26	(User A is informed that UE_B is ringing
that the call has been answered 200 OK IMS_B forwards 200 OK response to IMS_B AS 200 OK IMS_B AS forwards 200 OK response to IMS_B 31 200 OK IMS_B forwards the 200 OK response to IBCF_B 200 OK IBCF_B forwards the 200 OK response to	27											User B answers call
200 OK IMS_B AS forwards 200 OK response to IMS_B 200 OK IMS_B forwards the 200 OK response to IBCF_B 200 OK IBCF_B forwards the 200 OK response to	28								\longrightarrow			that the call has been answered
31 IMS_B 200 OK IMS_B forwards the 200 OK response to IBCF_B 200 OK IBCF_B forwards the 200 OK response to	29								-	\longrightarrow	200 OK	IMS_B forwards 200 OK response to IMS_B AS
32 BCF_B 200 OK IBCF_B forwards the 200 OK response to	30								₭		200 OK	
	31							←			200 OK	
	32						—				200 OK	IBCF_B forwards the 200 OK response to

Step					Di	rectio	n						Message	Comment
	U	U	U	U	ı	E	Ξ	ı	ı			Α		
	S	E	S	E	M			В	В	N		S		
	е	Α	е	В	_	1 -	י ו	<u>c</u>	C	5		В		
	r		r		A		-	F	F	E	3			
	A		В	Ь.,	1 1	D	В	Α	В				222 214	1005 4 () 11 000 01(
33													200 OK	IBCF_A forwards the 200 OK response to IMS_A
34													200 OK	IMS_A forwards the 200 OK response to UE_A
35														User A is informed that call has been answered

4.5.5.4 Supplementary Service OIP with AS in roaming

		Interoperability To	est Description						
Identifier:	TD_IMS_	_SS_0004							
Summary:		vork supports properly app entary service	olication services based on the example of the OIP						
Configuration:	CF_ROA	M_AS							
SUT:	IMS_A aı	nd IMS_B							
References:	Test Pur	pose	Specification Reference						
	TP_IMS_5097_02 TS 124 229 [1], clause 5.4.3.2 ¶1 (item 9 in 1 st numbered list) TP_IMS_5108_03 TS 124 229 [1], clause 5.4.3.3 ¶5								
	TP_IMS_	_5115_08	(item 4 in 1 st numbered list) TS 124 229 [1], clause 5.4.3.3 ¶89 (4 th numbered list)						
Use Case ref.:	UC_08_F	2	(1 Hamborod not)						
Pre-test conditions:	UE_perUE_tablIMS	_A and UE_B have IP bea clause 4.2.1 _A is registered in IMS_A _B is registered in IMS_B	via IMS_A using userOIP identity according to ct AS_B (OIP)						
-									
Test Sequence:	Step								
	2	displayed	rmed of incoming call of User A, user A's identity is						
	3		rmed that UE_B is ringing						
	4	User B answers call							
	5		rmed that call has been answered						
	6		rmed that the call is established						
	7	User A ends call							
	8		ormed that call has ended						
	9	Verify that user A is info	rmed that call has ended						
Conformance	Check								
Criteria:	1	then { IMS_A sends the containin indication	es an initial INVITE from UE_A addressed_to UE_B e initial INVITE to IMS_B g a P-Asserted-Identity_header ng the SIP_URI of UE_A g a P-Asserted-Identity_header						
	2		ng the Tel_URI of UE_A }						



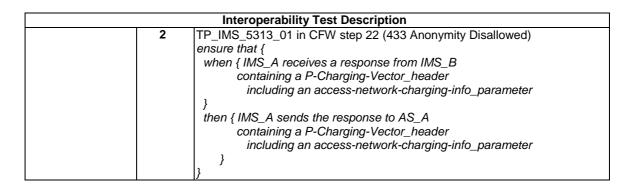


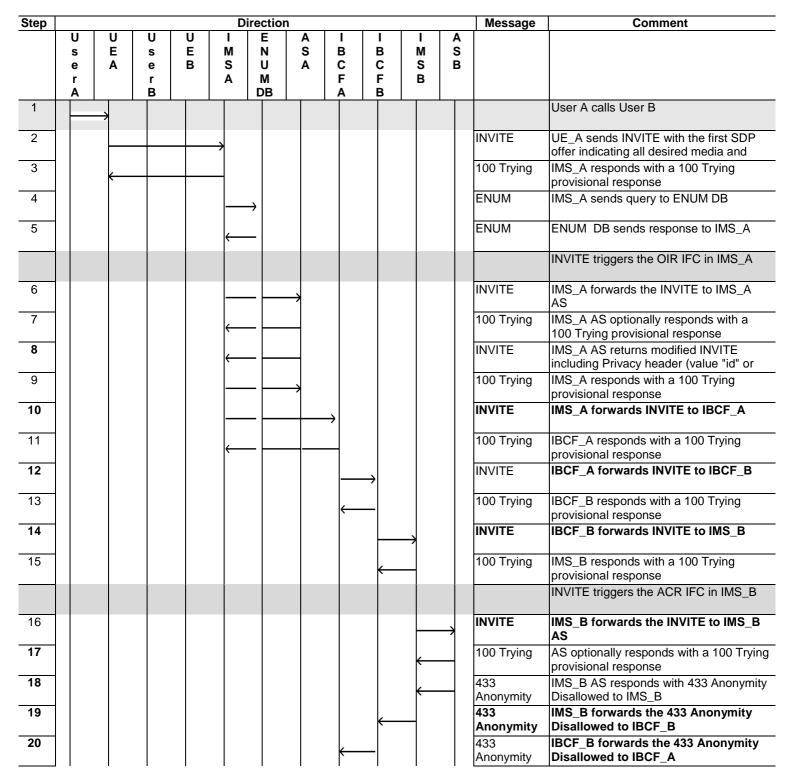
100 Trying ISCF_B responds with a 100 Trying provisional response INVITE ISCF_A forwards INVITE to ISCF_A ISCF_B responds with a 100 Trying provisional response INVITE ISCF_B responds with a 100 Trying provisional response INVITE ISCF_A forwards INVITE to ISCF_A ISCF_B responds with a 100 Trying provisional response INVITE ISCF_B forwards INVITE to ISCF_A ISCF_B responds with a 100 Trying provisional response INVITE ISCF_B forwards INVITE to ISCF_A ISCF_B responds with a 100 Trying provisional response INVITE ISCF_B responds with a 100 Trying provisional response INVITE ISCF_B responds with a 100 Trying provisional response INVITE ISCF_B responds with a 100 Trying provisional response INVITE ISCF_B responds with a 100 Trying provisional response INVITE ISCF_B responds to intal INVITE with 180 response INVITE ISCF_B responds to intal INVITE with 180 response INVITE ISCF_B responds to intal INVITE INVITE ISCF_B responds to intal INVITE	Step					Directio	n				Message	Comment
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100 Trying (BCF_B responds with a 100 Trying provisional response (INVITE to IBCF A) (INV		-	Α	_	В) c	; c				
Invite IBCF_B forwards INVITE to IBCF_A	17			1					3		100 Trying	IRCE B responds with a 100 Trying provisional
100 Trying BCF A responds with a 100 Trying provisional response INVITE IBCF A forwards INVITE to IMS_A 100 Trying IMS_A responds with a 100 Trying provisional response INVITE IBCF A forwards INVITE to IMS_A 100 Trying IMS_A responds with a 100 Trying provisional response INVITE IMS_A forwards the INVITE to UE_B 100 Trying IMS_A forwards Invite INVITE												response
response INVITE IBCF_A forwards INVITE to IMS_A 100 Trying IMS_A responds with a 100 Trying provisional response INVITE IMS_A forwards the INVITE to UE_B 100 Trying US_B optionally responds with a 100 Trying provisional response INVITE IMS_A forwards the INVITE to UE_B 100 Trying US_B optionally responds with a 100 Trying provisional response with a 100 Trying US_B optionally response with a 100 Trying US_B optionally response with a 100 Trying provisional response with a 100 Trying US_B response to INVITE with 180 Imserting IMS_B response to INVITE with 180 Imserting IMS_B response to INVITE with 180 Imserting IMS_B forwards 180 Ringing response to INVITE With 180 Imserting IMS_B response to INVITE With 180 Imserting IMS_B response to INVITE With 180 Imserting IMS_B response to IMS_B AS_B response to IMS_B Imserting IMS_B response to IMS_B Imserting	18										INVITE	IBCF_B forwards INVITE to IBCF_A
INVITE BCF_A forwards INVITE to IMS_A	19							\longrightarrow			100 Trying	
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INVITE	21						\longrightarrow				100 Trying	
provisional response User B is informed of incoming call of User A, User A's identity is displayed 180 Ringing User B responds to initial INVITE with 180 Ringing response to Inscrepe to Indicate that it has started alerting 180 Ringing ISEF A forwards 180 Ringing response to ISEF A 180 Ringing ISEF A forwards 180 Ringing response to ISEF B 180 Ringing ISEF B forwards 180 Ringing response to ISEF B 180 Ringing IMS B forwards 180 Ringing response to INS B AS 180 Ringing IMS B AS forwards 180 Ringing response to INS B AS forwards 180 Ringing response to ISEF B 180 Ringing IMS B forwards 180 Ringing response to ISEF B 180 Ringing IMS B forwards the 180 Ringing response to ISEF B 180 Ringing IMS A forwards the 180 Ringing response to ISEF B 180 Ringing IMS A forwards the 180 Ringing response to ISEF B 180 Ringing IMS A forwards the 180 Ringing response to ISEF B 180 Ringing IMS A forwards the 180 Ringing response to ISEF B 180 Ringing IMS A forwards the 180 Ringing response to ISEF B 180 Ringing IMS A forwards 200 CM Ringing response to ISEF B 180 Ringing IMS A forwards 200 CM Response to ISEF B 200 CM ISEF B forwards 200 CM response to IBCF B 200 CM IMS B forwards 200 CM response to IMS B 200 CM IMS B forwards 200 CM response to IMS B 200 CM IMS B forwards 200 CM response to IMS B 200 CM IMS B forwards 200 CM response to IMS B 200 CM IMS B forwards 200 CM response to ISEF B 200 CM IMS B forwards 200 CM response to ISEF B 200 CM IMS B forwards 200 CM response to ISEF B 200 CM IMS B forwards 200 CM response to ISEF B 200 CM IMS B forwards 200 CM response to ISEF B 200 CM IMS B forwards 200 CM response to ISEF B 200 CM IMS B forwards 200 CM response to ISEF B 200 CM IMS B forwards 200 CM response to ISEF B 200 CM IMS B forwards 200 CM response to ISEF B 200 CM IMS B forwards 200 CM response to ISEF B 200 CM IMS B forwards 200 CM response to ISEF B 200 CM IMS B forwards 200 CM response to ISEF B 200 CM IMS B forwards 200 CM response to ISEF B 200 CM	22										INVITE	
User B is informed of incoming call of User A, User A's identity is displayed 180 Ringing UE B responds to initial INVITE with 180 Ringing to indicate that it has started alerting 180 Ringing to indicate that it has started alerting 180 Ringing to indicate that it has started alerting 180 Ringing response to IBCF_A 180 Ringing IMS_A forwards 180 Ringing response to IBCF_B 180 Ringing IBCF_B forwards 180 Ringing response to IBCF_B 180 Ringing IBCF_B forwards 180 Ringing response to IMS_B AS 180 Ringing response to IMS_B AS 180 Ringing response to IMS_B AS 180 Ringing IMS_B AS forwards 180 Ringing response to IMS_B AS 180 Ringing IMS_B forwards 180 Ringing response to IMS_B AS 180 Ringing IMS_B forwards the 180 Ringing response to IMS_B AS 180 Ringing IMS_B forwards the 180 Ringing response to IMS_A 180 Ringing IMS_A forwards the 180 Ringing response to IMS_A 180 Ringing IMS_A forwards the 180 Ringing response to IMS_A 180 Ringing IMS_A forwards the 180 Ringing response to IMS_A 180 Ringing IMS_A forwards the 180 Ringing response to IMS_A 180 Ringing IMS_A forwards the 180 Ringing response to IMS_A 180 Ringing IMS_A forwards the 180 Ringing response to IMS_A 180 Ringing IMS_A forwards 180 Ringing response to IMS_B 180 Ringing IMS_A forwards 200 CM IMS_A forwards 200 CM Response to IMS_B 200 CM IMS_B forwards 200 CM response to IMS_B 200 CM IMS_B 100 CM Ringing response to IMS_B 200 CM IMS_B 100 CM Ringing response to IMS_B 200 CM IMS_B 100 CM Ringing response to IMS_B 200 CM IMS_B 100 CM Ringing response to IMS_B 200 CM IMS_B 100 CM Ringing response to IMS_B 200 CM IMS_B 100 CM Ringing Response to IMS_B 200 CM IMS_B 100 CM Ringing Response to IMS_B 200 CM IMS_B 100 CM Ringing Response to IMS_B 200 CM IMS_B 100 CM Ringing Response to IMS_B 200 CM IMS_B 100 CM Ringing Response to IMS_B 200 CM IMS_B 100 CM Ringing Ringing Ringing Ringing Ringing Ringing Ringing Rin	23					>					100 Trying	
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BCF_B 180 Ringing IBCF_B 180 Ringing response to IBCF_A 180 Ringing 180 Ringi	30										180 Ringing	
180 Ringing lBCF_A forwards the 180 Ringing response to lBS_A forwards the 180 Ringing response to UE_A 180 Ringing lMS_A forwards the 180 Ringing response to UE_A 180 Ringing lMS_A forwards the 180 Ringing response to UE_A User A is informed that UE_B is ringing User B answers call 200 OK UE_B responds INVITE with 200 OK to indicate that the call has been answered 200 OK IMS_A forwards 200 OK response to IBCF_B 200 OK IBCF_A forwards 200 OK response to IMS_B 200 OK IMS_B forwards 200 OK response to IMS_B AS 140 141 200 OK IMS_B AS forwards 200 OK response to IMS_B AS 200 OK IMS_B Forwards 200 OK response to IMS_B AS 200 OK IMS_B Forwards 200 OK response to IMS_B AS 200 OK IMS_B Forwards 200 OK response to IMS_B AS 200 OK IMS_B Forwards 200 OK response to IMS_B AS 200 OK IMS_B Forwards 200 OK response to IMS_B AS 200 OK IMS_B Forwards 200 OK response to IMS_B AS	31										180 Ringing	
34 35 36 37 38 39 40 40 41 42 43 44 44 180 Ringing IMS_A forwards the 180 Ringing response to UE_A IMS_B forwards 200 OK response to IMS_B IMS_A forwards 200 OK response to IMS_B IMS_A forwards 200 OK response to IMS_B IMS_B forwards 200 OK response 200 OK IMS_B forwards 200 OK response 200 OK IMS_B forwards 200 O	32										180 Ringing	
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36 User B answers call 200 OK UE_B responds INVITE with 200 OK to indicate that the call has been answered 200 OK IMS_A forwards 200 OK response to IBCF_A 200 OK IBCF_A forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IMS_B 200 OK IMS_B forwards 200 OK response to IMS_B AS 200 OK IMS_B forwards 200 OK response to IMS_B AS 100 OK IMS_B forwards 200 OK response to IMS_B AS 100 OK IMS_B forwards 200 OK response to IMS_B AS 100 OK IMS_B forwards the 200 OK response to IBCF_B AS 100 OK IMS_B forwards the 200 OK response to IBCF_B AS 100 OK IMS_B forwards the 200 OK response to IBCF_B AS 100 OK IMS_B forwards the 200 OK response to IBCF_B AS 100 OK IMS_B forwards the 200 OK response to IBCF_B AS 100 OK IMS_B forwards the 200 OK response to IBCF_B AS 100 OK IMS_B forwards the 200 OK response to IBCF_B AS 100 OK IMS_B forwards the 200 OK response to IBCF_B AS 100 OK IMS_B forwards the 200 OK response to IBCF_B AS 100 OK IMS_B forwards the 200 OK response to IBCF_B AS 100 OK IMS_B forwards the 200 OK response to IBCF_B AS 100 OK IMS_B forwards the 200 OK response to IBCF_B AS 100 OK IMS_B forwards the 200 OK response to IBCF_B AS 100 OK IMS_B forwards the 200 OK response to IBCF_B AS 100 OK 100	34		←								180 Ringing	
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that the call has been answered 200 OK IMS_A forwards 200 OK response to IBCF_A 200 OK IBCF_A forwards 200 OK response to IBCF_B 200 OK IBCF_B forwards 200 OK response to IMS_B 200 OK IMS_B forwards 200 OK response to IMS_B AS 200 OK IMS_B AS forwards 200 OK response to IMS_B AS 200 OK IMS_B AS forwards 200 OK response to IMS_B AS 200 OK IMS_B forwards the 200 OK response to IBCF_B 200 OK IMS_B forwards the 200 OK response to IBCF_B 200 OK IMS_B forwards the 200 OK response to IBCF_B	36				\rightarrow							User B answers call
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200 OK IBCF_B forwards 200 OK response to IMS_B 200 OK IMS_B forwards 200 OK response to IMS_B AS 200 OK IMS_B AS forwards 200 OK response to IMS_B AS 200 OK IMS_B forwards the 200 OK response to IBCF_B 200 OK IBCF_B forwards the 180 Ringing response to	38						\longrightarrow				200 OK	
200 OK IMS_B forwards 200 OK response to IMS_B AS 200 OK IMS_B AS forwards 200 OK response to IMS_B AS 200 OK IMS_B forwards the 200 OK response to IBCF_B 200 OK IBCF_B forwards the 180 Ringing response to	39							\longrightarrow			200 OK	IBCF_A forwards 200 OK response to IBCF_B
200 OK IMS_B AS forwards 200 OK response to IMS_B forwards the 200 OK response to IBCF_B 200 OK IBCF_B forwards the 180 Ringing response to	40										200 OK	IBCF_B forwards 200 OK response to IMS_B
43 44 IMS_B 200 OK IMS_B forwards the 200 OK response to IBCF_B 200 OK IBCF_B forwards the 180 Ringing response to	41										200 OK	IMS_B forwards 200 OK response to IMS_B AS
43 200 OK IMS_B forwards the 200 OK response to IBCF_B 200 OK IBCF_B forwards the 180 Ringing response to	42										200 OK	
44 200 OK IBCF_B forwards the 180 Ringing response to	43										200 OK	IMS_B forwards the 200 OK response to
	44										200 OK	

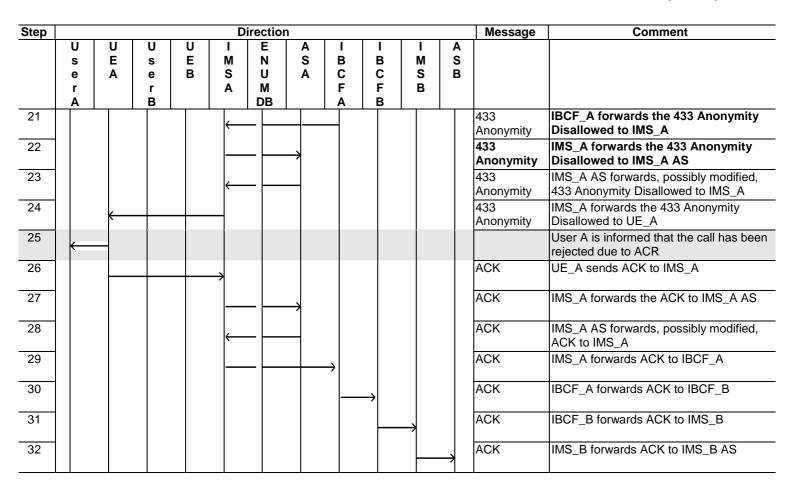
Step					Dire	ection						Message	Comment
	U	C	U	U	I	Е	I	ı			Α		
	S	E	s	E	M	N	В	В	N		S		
	е	Α	е	В	S	U	C	C			В		
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45	Α		В	1		DB	A	<u> </u>			1	000 014	IDOE A (L II 400 D)
45					←							200 OK	IBCF_A forwards the 180 Ringing response to IMS_A
46		←										200 OK	IMS_A forwards the 200 OK response to UE_A
47	←												User A is informed that call has been answered
	,												

4.5.5.5 Supplementary Services OIR and ACR with AS

		Interoperability Test Desc	ription							
Identifier:	TD_IMS_S		•							
Summary:	IMS netwo	ork supports properly application s supplementary services	services based on the example of the OIR							
Configuration:	CF_INT_A	AS .								
SUT:	IMS_A ar	nd IMS_B								
References:	Test Purp	ose	Specification Reference							
	TP_IMS_5	5108_03	TS 124 229 [1], clause 5.4.3.3 ¶5							
			(item 4 in 1 st numbered list)							
	TP_IMS_5	5313_01	TS 124 229 [1], clause 5.4.6.1.3 ¶2							
Use Case ref.:	UC_06_I		1 2							
conditions:	per d	E_A and UE_B have IP bearers established to their respective IMS networks as a r clause 4.2.1 E_A is registered in IMS_A using userOIR identity according to table 1 E_B is registered in IMS_B using any userACR identity according to table 1 S_A is configured to contact AS_A (OIR) E_B is subscribed to ACR service S_B is configured to contact AS_B (ACR)								
T1 0	01									
Test Sequence:	Step	11 A II II B //	D: 1140 D)							
	1	User A calls User B (i.e. userAC								
	2	Verily that user A is informed that	at call has been rejected due to ACR							
Conformance Criteria:	Check									
	1	then { IMS_B sends the initial I containing a topmost Rou indicating the SIP_URI containing a Route_head indicating the S-CSCF_containing a P-Charging-including a orig-ioi_para	al INVITE from IMS_A addressed_to UE_B } NVITE to AS_B Ite_header I of AS_B and Iter _SIP_URI of IMS_B and Vector_header I ameter I dentifier of IMS_A and							







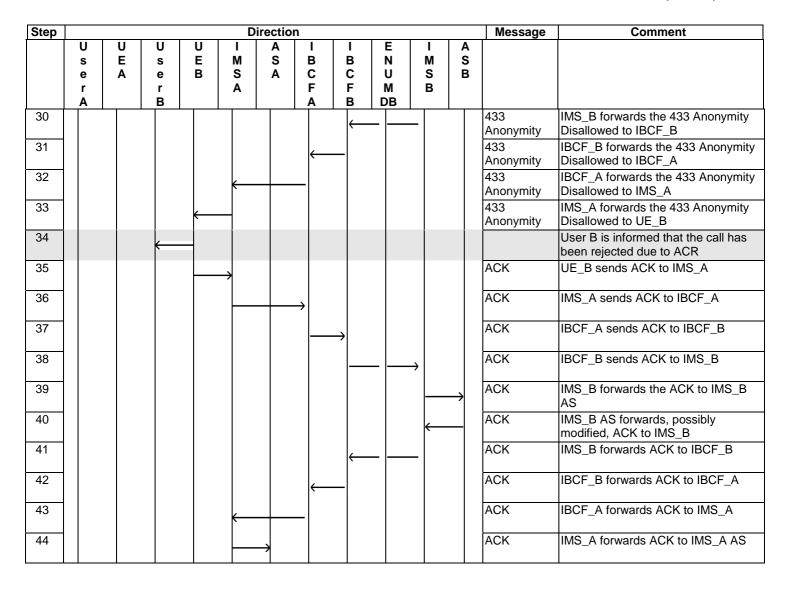
4.5.5.6 Supplementary Services OIR and ACR with AS in roaming

	Interoperability	Test Description											
Identifier:	TD_IMS_SS_0006												
Summary:	IMS network supports properly application services based on the example of the OIR												
	and ACR supplementary service	CR supplementary services											
Configuration:	CF_ROAM_AS												
SUT:	IMS_A and IMS_B												
References:	Test Purpose	Specification Reference											
	TP_IMS_5046_01	TS 124 229 [1], clause 5.2.6.3.3 ¶1 (1 st 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 st numbered list)											
Use Case ref.:	UC_06_R	,											
Pre-test conditions:	 HSS of IMS_A and of IMS B is configured according to table 1 UE_A and UE_B have IP bearers established to their respective IMS networks as per clause 4.2.1 UE_A is registered in IMS_A using any userACR identity according to table 1 UE_B is registered in IMS_B via IMS_A using userOIR identity according to table 1 UE_A is subscribed to ACR service IMS_B is configured to contact AS_B (OIR) IMS_A is configured to COIR service UE_B is subscribed to OIR service 												
Test Sequence:	Step												
rest bequeite.	-	e userΔCR in IMS_R)											
	1 User B calls User A (i.e. userACR in IMS_B) 2 Verify that user B is informed that call has been rejected due to ACR												
	1 2 IVArity that Hear Richin	ntormed that call has been rejected due to Mi 'P											

		Interoperability Test Description
Conformance	Check	
Criteria:	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 12 (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) }
		}
	1	V

Step					D	irectio	n					Message	Comment
	U ø e r ∢	U E A	U s e r B	UEB	I M S A	A S A	- B C F A	I B C F B	E N U M DB	I M S B	A S B		
1				\rightarrow									User B calls User A
2					\rightarrow							INVITE	UE_B sends INVITE with the first SDP offer indicating all desired
3				-	\dashv							100 Trying	IMS_A responds with a 100 Trying provisional response

Note	Step			Dire	ection						Message	Comment
4 4 5 6 7 8 9 100 Trying iBCF, A responds with a 100 Trying provisional response to IMS B 100 Trying iBS, B sends query to ENUM DB 11 12 13 13 14 15 16 17 18 18 19 20 21 19 20 21 21 22 23 24 25 26 27 28 29 29 29 20 20 20 21 20 20 20 20 20 20 20 20 20 20 20 20 20			-	I M		I B	I B		I M			
A B B DB INTITE IMS A sends INVITE to IBCF A 100 Trying provisional response in INVITE INTITE		е	е	S		С	С	U	S			
100 Trying provisional response invite to IBCF and sends invite to IMS and sends query to ENUM DB and sends										-	INDUTE	IMO A sanda INIVITE (a IDOE A
provisional response INVITE IBCF_A sends INVITE to IBCF_B	4				\mapsto						INVITE	IM5_A sends INVITE to IBCF_A
100 Trying IBCF_B responds with a 100 Trying provisional response INVITE IBCF_B sends INVITE to IMS_B INVITE IBCF_B sends invite INVITE												provisional response
INVITE IBCF_B responds with a 100 Trying IMS_B AS optionally response INVITE IMS_B INVITE IMS_B OPEN IMS_B AS optionally response INVITE IMS_B OPEN IMS_B AS optionally response INVITE IMS_B AS optionally response INVITE IMS_B CAS	6						•				INVITE	IBCF_A sends INVITE to IBCF_B
9 100 Trying IMS B responds with a 100 Trying provisional response ENUM IMS B sends query to ENUM DB ENUM DB ENUM DB Sends query to ENUM DB Sends query to ENUM DB ENUM DB Sends query to ENUM DB Sen	7										100 Trying	
provisional response ENUM IMS B sends query to ENUM DB ENUM ENUM DB sends response to IMS B ENUM ENUM DB sends response to IMS B INVITE triggers the OIR IFC in IMS B NaS INVITE IMS B Forwards the INVITE to IMS B AS 100 Trying IMS B AS captionally responds with a 100 Trying provisional response INVITE IMS B Forwards INVITE to IBCF_B INVITE IBCF_B INVITE to IBCF_B INVITE IBCF_B INVITE to IBCF_B INVITE IBCF_B INVITE to IBCF_A INVITE IBCF_A responds with a 100 Trying provisional response INVITE IBCF_A responds with a 100 Trying provisional response INVITE IBCF_A forwards INVITE to IBCF_A INVITE IBCF_A forwards INVITE to IMS_A INVITE IBCF_A forwards INVITE to IMS_A INVITE IBCF_A forwards INVITE to IMS_A INVITE IBCF_A forwards the INVITE to IMS_A INVITE IMS_A forwards the INVITE to IMS_A INVITE IMS_A forwards the INVITE to IMS_A INVITE IMS_A forwards the 433 Anonymity Ims_A INS_B INVITE to IMS_A IMS_B Forwards the 433 Anonymity Ims_A INS_B Forwards the 433 Anonymity Ims_A INS_B Forwards the 433 Anonymity Ims_B For	8							\longrightarrow	,		INVITE	IBCF_B sends INVITE to IMS_B
ENUM ENUM DB sends response to IMS B NVITE triggers the OIR IFC in INVITE to IMS_B as as as a loop triving provisional response or INVITE to IMS_B as as a loop triving provisional response or INVITE INVITE INVITE INVITE INVITE TO INVITE INVITE INVITE TO INVITE INVI	9										100 Trying	
12 INVITE triggers the OIR IFC in INVITE triggers the OIR IFC in INVITE IMS B forwards the INVITE to IMS B AS and 100 Trying IMS, B AS optionally responds with a 100 Trying IMS, B AS optionally responds with a 100 Trying IMS, B AS optionally responds with a 100 Trying IMS, B AS optionally responds with a 100 Trying Ims, B AS optionally responds with a 100 Trying Ims, B responds with a 100 Trying provisional response INVITE IMS, B forwards INVITE to IBCF_B 100 Trying IBCF_B responds with a 100 Trying provisional response INVITE Ims, AS 100 Trying Ims, A responds with a 100 Trying Ims, A forwards InvITE to IMS_A 100 Trying Ims, A forwards InvITE to Ims, AS 100 Trying Ims, A forwards the Aday Anonymity Ims, AS 100 Trying Ims, AS optionally responds with a 100 Trying Ims, A AS 100 Trying Ims, A	10								•		ENUM	IMS B sends query to ENUM DB
INVITE IMS_B forwards the INVITE to IMS_B AS optionally responds with a 100 Trying provisional response INVITE IMS_B AS returns modified INVITE IMS_B AS returns modified INVITE IMS_B AS returns modified INVITE IMS_B RAS returns modified INVITE IMS_B RAS returns modified INVITE IMS_B Responds with a 100 Trying provisional response INVITE IMS_B forwards INVITE to IBCF_B INVITE IMS_B forwards INVITE to IBCF_B INVITE IMS_B forwards INVITE to IBCF_A INVITE IMS_B forwards INVITE to IBCF_A INVITE IMS_A responds with a 100 Trying provisional response INVITE IMS_A responds with a 100 Trying provisional response INVITE IMS_A forwards INVITE to IMS_A IMS_A AS returns modified INVITE IMS_A forwards INVITE to IMS_A IMS_A AS returns modified INVITE IMS_A forwards INVITE to IMS_A IMS_A AS returns modified INVITE IMS_A forwards INVITE to IMS_A IMS_A AS returns modified INVITE IMS_A forwards INVITE to IMS_A IMS_A AS returns modified INVITE IMS_A forwards InvITE IMS_A for	11								,		ENUM	ENUM DB sends response to IMS B
13 14 15 16 17 17 16 17 18 18 18 18 19 19 19 19												IMS_B
14 15 16 17 18 18 19 20 21 21 22 23 24 24 25 26 27 28 29 29 29 20 20 21 21 22 23 24 25 26 26 27 28 29 29 20 20 20 20 21 21 22 23 24 25 26 26 27 28 29 29 20 20 20 20 20 20 20 20 20 20 20 20 21 21 22 23 24 25 26 26 27 28 28 29 29 20 20 20 20 20 20 20 20 21 21 22 23 24 25 26 26 27 28 28 29 29 20 20 20 20 20 21 21 22 23 24 24 25 26 26 27 28 28 29 29 20 20 20 20 20 20 20 20 20 21 21 22 23 23 24 24 25 26 27 28 28 29 29 20 20 20 20 21 21 22 23 24 24 25 26 27 28 28 29 29 20 20 20 20 20 20 20 20 20 20 20 20 20	12									\rightarrow	INVITE	
including Privacy header (value "id" 100 Trying provisional response INVITE IMS_B responds with a 100 Trying provisional response INVITE IBCF_B forwards INVITE to IBCF_B 100 Trying provisional response INVITE IBCF_B forwards INVITE to IBCF_A 100 Trying IBCF_B forwards INVITE to IBCF_A 100 Trying provisional response INVITE IBCF_A forwards INVITE to IMS_A 100 Trying provisional response INVITE triggers the ACR IFC in IMS_A responds with a 100 Trying provisional response INVITE INMS_A AS 100 Trying provisional response INVITE INMS_A AS 100 Trying provisional response INVITE INMS_A AS 100 Trying provisional response INMS_A AS 100 Trying provisional response IMS_A AS 100 Trying provisiona	13								←		100 Trying	
15 16 17 18 19 20 21 21 21 22 21 22 23 24 25 26 27 28 29 29 29 20 20 20 21 21 22 23 24 25 26 27 28 29 29 20 20 20 20 20 21 21 22 23 24 25 26 26 27 28 29 29 20 20 20 20 20 20 20 20 20 20 20 21 21 22 23 24 25 26 26 27 28 29 29 20 20 20 20 20 20 20 20 20 21 21 21 22 23 24 25 26 26 27 28 29 29 20 20 20 20 20 20 20 20 20 20 20 20 20	14								\leftarrow		INVITE	
INVITE IMS_B forwards INVITE to IBCF_B 100 Trying IBCF_B responds with a 100 Trying provisional response INVITE to IBCF_A 100 Trying IBCF_A responds with a 100 Trying provisional response INVITE IBCF_A forwards INVITE to IMS_A 100 Trying IBCF_A responds with a 100 Trying provisional response INVITE IBCF_A forwards INVITE to IMS_A 100 Trying IMS_A responds with a 100 Trying provisional response INVITE triggers the ACR IFC in IMS_A AS 100 Trying AS optionally responds with a 100 Trying provisional response 22 23 24 25 26 27 28 29 30 31 31 32 32 33 34 34 33 34 34 35 35 36 36 37 38 38 38 38 38 38 38 38 38	15									\rightarrow	100 Trying	IMS_B responds with a 100 Trying
provisional response INVITE IBCF_B forwards INVITE to IBCF_A 100 Trying IBCF_A responds with a 100 Trying provisional response INVITE IBCF_A forwards INVITE to IMS_A 100 Trying IMS_A responds with a 100 Trying provisional response INVITE triggers the ACR IFC in IMS_A 100 Trying IMS_A forwards the INVITE to IMS_A 100 Trying IMS_A forwards the 433 Anonymity Disallowed to IMS_A 100 Trying IMS_A S responds with a 100 Trying provisional response 100 Trying IMS_A forwards the 433 Anonymity Disallowed to IMS_B 100 Trying IMS_A forwards the 433 Anonymity Disallowed to IMS_B 100 Trying IMS_B forwards the 433 Anonymity Disallowed to IMS_B 100 Trying IMS_B forwards the 433 Anonymity Disallowed to IMS_B 100 Trying IMS_B forwards the 433 Anonymity Disallowed to IMS_B 100 Trying IMS_B forwards the 433 Anonymity Disallowed to IMS_B 100 Trying IMS_B AS forwards the 433 Anonymity Disallowed to IMS_B 100 Trying IMS_B AS forwards the 433 Anonymity Disallowed to IMS_B 100 Trying IMS_B AS forwards the 433 Anonymity Disallowed to IMS_B 100 Trying IMS_B AS forwards the 433 Anonymity Disallowed to IMS_B 100 Trying IMS_B AS forwards the 433 Anonymity Disallowed to IMS_B AS IMS_B AS forwards the 433 Anonymity Disallowed to IMS_B AS IMS_B AS forwards the 433 Anonymity Disallowed to IMS_B AS IMS_B AS forwards the 433 Anonymity Disallowed to IMS_B AS IMS_B AS forwards the 433 Anonymity Disallowed to IMS_B AS IMS_B AS forwards the 433 Anonymity Disallowed to IMS_B AS IMS_B A	16										INVITE	-
18 19 20 21 21 21 21 21 22 23 24 25 26 27 28 29 29 20 20 20 21 21 22 23 24 25 26 27 28 29 29 20 20 20 20 20 20 20 20 20 20 20 20 20	17							\longrightarrow	,		100 Trying	
provisional response INVITE IBCF_A forwards INVITE to IMS_A 100 Trying IMS_A responds with a 100 Trying provisional response INVITE triggers the ACR IFC in IMS_A INVITE IMS_A forwards the INVITE to IMS_A AS 100 Trying AS optionally responds with a 100 Trying provisional response 433 IMS_A AS responds with 433 Anonymity Disallowed to IMS_A 25 As a IMS_A forwards the 433 Anonymity Disallowed to IBCF_A 433 IMS_B forwards the 433 Anonymity Disallowed to IBCF_B 433 IBCF_B forwards the 433 Anonymity Disallowed to IMS_B AS Anonymity Disallowed to IMS_B AS IMS_B forwards, possibly	18						-				INVITE	IBCF_B forwards INVITE to IBCF_A
21 INVITE IBCF_A forwards INVITE to IMS_A 100 Trying IMS_A responds with a 100 Trying provisional response INVITE triggers the ACR IFC in IMS_A AS IMS_A AS 100 Trying AS optionally responds with a 100 Trying AS optionally responds with a 100 Trying AS optionally responds with a 100 Trying provisional response 433 IMS_A AS responds with 433 Anonymity Disallowed to IMS_A As Anonymity Disallowed to IMS_A As IMS_A forwards the 433 Anonymity Disallowed to IBCF_A 433 IBCF_A forwards the 433 Anonymity Disallowed to IMS_B As IMS_B forwards the 433 Anonymity Disallowed to IMS_B As IMS_B forwards the 433 Anonymity Disallowed to IMS_B As IMS_B forwards the 433 Anonymity Disallowed to IMS_B As IMS_B forwards, possibly IMS_B forwards, possibly As IMS_B AS	19						>				100 Trying	
provisional response INVITE triggers the ACR IFC in IMS_A INVITE IMS_A forwards the INVITE to IMS_A AS INVITE IMS_A AS optionally responds with a 100 Trying AS optionally response 433 IMS_A AS responds with 433 Anonymity Disallowed to IMS_A 433 IMS_A forwards the 433 Anonymity Disallowed to IBCF_A 433 IBCF_A forwards the 433 Anonymity Disallowed to IBCF_B 433 IBCF_B forwards the 433 Anonymity Disallowed to IBCF_B 433 IMS_B forwards the 433 Anonymity Disallowed to IMS_B 433 IMS_B forwards the 433 Anonymity Disallowed to IMS_B 433 IMS_B forwards the 433 Anonymity Disallowed to IMS_B 433 IMS_B forwards the 433 Anonymity Disallowed to IMS_B AS 433 IMS_B forwards the 433 Anonymity Disallowed to IMS_B AS	20			.	<u> </u>	_					INVITE	-
INVITE triggers the ACR IFC in IMS_A	21				 						100 Trying	
23 24 25 26 27 28 29 29 20 20 21 22 23 24 25 26 27 28 29 29 20 20 21 21 22 23 24 25 26 27 28 29 28 29 20 20 21 21 22 23 24 25 26 27 28 28 29 20 20 21 21 22 23 24 25 25 26 27 28 28 29 28 29 29 20 20 21 21 22 23 24 24 25 25 26 27 28 28 29 20 20 21 21 21 22 23 24 24 23 24 23 24 23 24 24 23 24 24 23 24 24 23 24 24 25 25 26 27 28 28 29 29 20 21 21 22 23 24 23 24 23 24 23 24 23 24 24 24 23 24 24 25 25 26 27 28 28 29 29 20 20 21 21 21 21 21 21 21 22 23 24 23 24 23 24 23 24 23 24 24 24 23 24 24 24 25 25 26 27 28 28 29 29 20 20 21 21 21 21 21 21 21 21 21 21 21 21 21												INVITE triggers the ACR IFC in
23 24 25 26 27 28 29 29 20 20 20 21 20 21 20 20 20 20 20 21 21 22 23 24 25 26 27 28 29 20 20 21 20 21 20 21 20 21 21 21 21 21 21 21 21 21 21 21 21 21	22				>						INVITE	
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25 26 27 28 29 433 IMS_A forwards the 433 Anonymity Disallowed to IBCF_A 433 Anonymity Disallowed to IBCF_B 433 IBCF_A forwards the 433 Anonymity Disallowed to IBCF_B 433 IBCF_B forwards the 433 Anonymity Disallowed to IMS_B 433 IMS_B forwards the 433 Anonymity Disallowed to IMS_B 433 IMS_B forwards the 433 Anonymity Disallowed to IMS_B AS 433 IMS_B AS forwards, possibly	24				-							IMS_A AS responds with 433
27 28 29 28 29 28 29 28 29 28 29 28 28 29 28 28 29 29 28 29 28 28 29 28 28 29 28 28 29 28 28 29 28 28 29 28 28 29 28 28 29 28 28 29 28 28 29 28 28 29 28 28 29 28 28 28 29 28 28 28 29 28 28 28 28 28 28 28 28 28 28 28 28 28	25				 	,					433	IMS_A forwards the 433 Anonymity
27 28 29 433 Anonymity Disallowed to IMS_B 433 IMS_B forwards the 433 Anonymity Disallowed to IMS_B AS 433 IMS_B AS forwards, possibly	26						•				433	IBCF_A forwards the 433 Anonymity
28 29 433 IMS_B forwards the 433 Anonymity Anonymity Disallowed to IMS_B AS 433 IMS_B AS forwards, possibly	27							\longrightarrow	,		433	IBCF_B forwards the 433 Anonymity
29 433 IMS_B AS forwards, possibly	28									\rightarrow	433	IMS_B forwards the 433 Anonymity
	29								—	-		IMS_B AS forwards, possibly

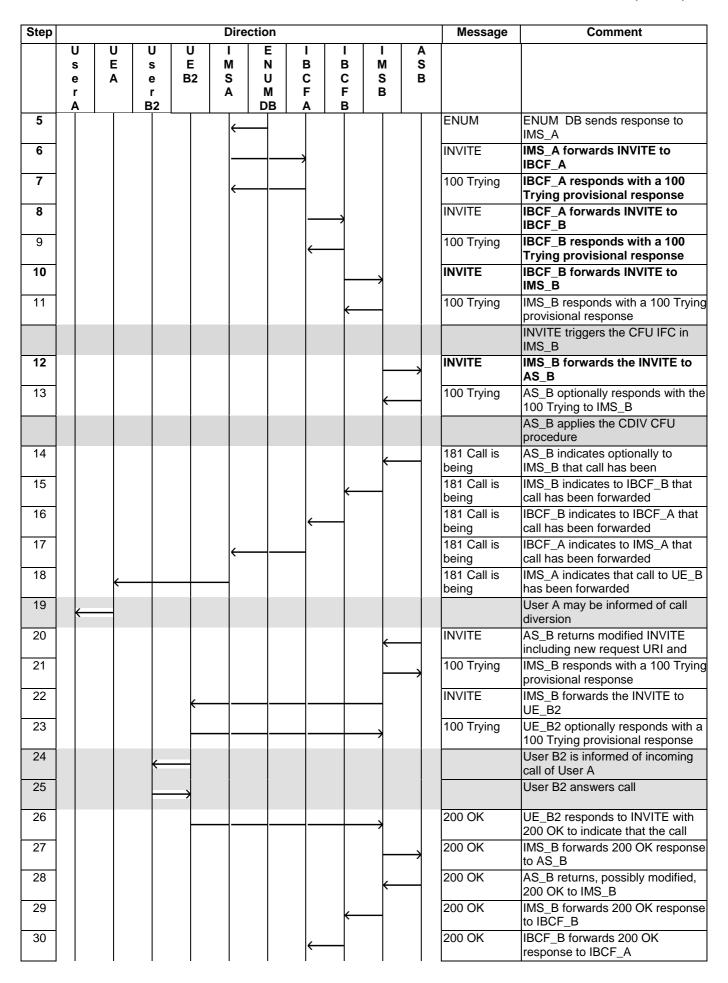


4.5.5.7 Supplementary Service CFU with AS

	Interoperability	Test Description									
Identifier:	TD_IMS_SS_0007	•									
Summary:	IMS network supports properly application services based on the example of the CFU										
	supplementary service										
Configuration:	CF_INT_AS										
SUT:	IMS_A and IMS_B										
References:	Test Purpose	Specification Reference									
	TP_IMS_5097_01	TS 124 229 [1], clause 5.4.3.2 ¶11 (1 st numbered list)									
TP_IMS_5108_03 TS 124 229 [1], clause 5.4.3.3 (item 4 in 1 st numbered list)											
	TP_IMS_5115_08	TS 124 229 [1], clause 5.4.3.3 ¶89 (4 th numbered list)									
Use Case ref.:	UC_11_I										
Pre-test conditions:	 HSS of IMS_A and of IMS B is configured according to table 1 UE_A and UE_B2 have IP bearers established to IMS_B as per clause 4.2.1 UE_A is registered in IMS_A using any user identity UE_B2 is registered in IMS_B using any user identity IMS_B is configured to contact AS_B (CFU) for userCFU UE_B1 is subscribed to IMS_B and has activated CFU service 										

		Interoperability Test Description
Test Sequence:	Step	Interoperability rest bescription
root ooquonoo.	1	User A calls User B (i.e. userCFU in IMS_B)
	2	User A may be informed of call diversion
	3	User B2 answers call
	4	Verify that user A is informed that call has been answered
	6	Verify that user B2 is informed that call is established
	7	User A ends call
	8	Verify that user B2 is informed that call has ended
	9	Verify that user A is informed that call has ended
	9	Verify that user A is informed that call has ended
Conformance	Check	
Criteria:	1	TP_IMS_5097_01 in CFW step 8 (INVITE):
Criteria.	1	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 a r-Charging-vector_header (containing an icid-value_parameter and
		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 an access-network-charging-into_parameter and not containing a term-ioi_parameter) and
		containing a term-ior_parameter) and containing a Record-Route_header
		indicating the originating S-CSCF_SIP_URI }
		Indicating the originating 3-C3CF_SIF_URI }
	2	TP_IMS_5108_03 in CFW step 12 (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 30 (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					Dire	ction					Message	Comment
	U s e r A	U E A	U s e r B2	U E B2	I M S A	E N U M DB	I B C F A	I B C F B	I M S B	A S B		
1		<u></u>										User A calls User B
2					\rightarrow						INVITE	UE_A sends INVITE with the first SDP offer indicating all desired
3		←									100 Trying	IMS_A responds with a 100 Trying provisional response
4						\rightarrow					ENUM	IMS_A sends query to ENUM DB



Step					Dire	ction					Message	Comment
	U s e r A	U E A	U s e r B2	U E B2	I M S A	E N U M DB	I B C F A	I B C F B	I M S B	A S B		
31					←						200 OK	IBCF_A forwards 200 OK response to IMS_A
32		\leftarrow									200 OK	IMS_A forwards 200 OK response to UE_A
33	\leftarrow											User A is informed that call has been answered

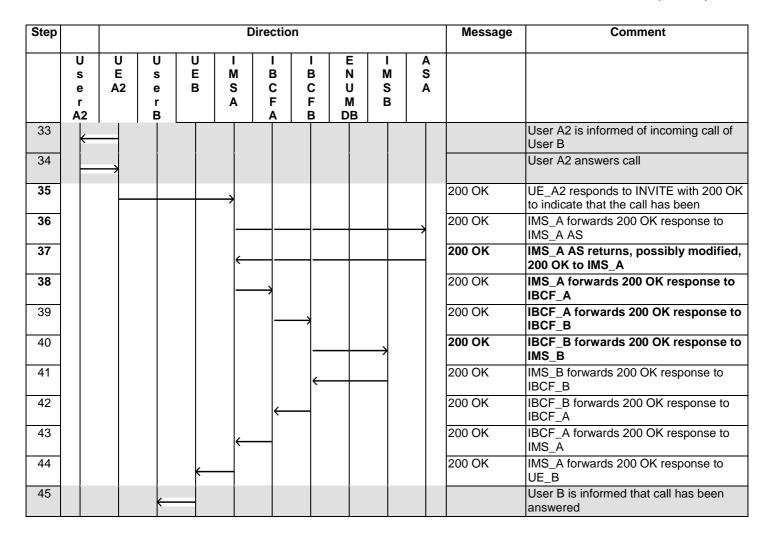
4.5.5.8 Supplementary Service CFU with AS in roaming

		Interoperability Te	st Description									
Identifier:	TD_IMS_	SS_0008										
Summary:	IMS netw	ork supports properly app	ork supports properly application services based on the example of the CFU									
-		ntary service										
Configuration:	CF_ROA	M_AS										
SUT:	IMS_A ar	nd IMS_B										
References:	Test Pur	pose	Specification Reference									
	TP_IMS_	5046_01	TS 124 229 [1], clause 5.2.6.3.3 ¶1 (1 st numbered list)									
	TP_IMS	5067_01	TS 124 229 [1], clause 5.2.7.2 ¶5									
	TP_IMS_	5070_01	TS 124 229 [1], clause 5.2.7.3 ¶3									
	TP_IMS_	5110_01	TS 124 229 [1], clause 5.4.3.3 ¶79 (after 6 th dashed list)									
Use Case ref.:	UC_11_R											
Pre-test conditions:	UE_UE_UE_IMS_	A and UE_B2 have IP bea A is registered in IMS_A u B2 is registered in IMS_B _A is configured to contac	s configured according to table 1 arers established to IMS_B as per clause 4.2.1 using any user identity via IMS_A using any user identity t AS_A (CFU) for userCFU A and has activated CFU service									
T 10	01											
Test Sequence:	Step	II. D. II. II. A ('	OFIL: IMO A)									
	1	User B calls User A (i.e.	= /									
	2	User B may be informed	ot call diversion									
	3	User A2 answers call	mad that call has been anawared									
	6		med that call has been answered									
	7	User B ends call	ormed that call is established									
			Verify that user A2 is informed that call has ended									
	<u>8</u> 9	,										
	9	Verify that user B is infor	med that call has ended									

		Interoperability Test Description
Conformance	Check	
Conformance Criteria:	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
	2	containing an icid-value_parameter } } 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
	3	TP_IMS_5070_01 in CFW step 15 (100 Trying) ensure that { when { IMS_A receives an initial INVITE from UE_B } then { IMS_A sends a 100_response to IMS_B } }
	4	TP_IMS_5110_01 in CFW step 39 (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					C	Directio	n				Message	Comment
	U s e r A2	U E A2	U s e r B	U E B	I M S A	I B C F A	I B C F B	E N U M DB	I M S B	A S A		
1			Ė	\rightarrow								User B calls User A
2					\rightarrow						INVITE	UE_B sends INVITE with the first SDP offer indicating all desired media and
3				←							100 Trying	IMS_A responds with a 100 Trying provisional response
4						\rightarrow					INVITE	IMS_A forwards INVITE to IBCF_A
5					\leftarrow						100 Trying	IBCF_A responds with a 100 Trying provisional response
6							\rightarrow				INVITE	IBCF_A forwards INVITE to IBCF_B

Step					D	irectio	n				Message	Comment
	U s	U E	U s	U E	I M	I B	I B	E N	I M	A S		
	е	A2	е	В	S	С	С	U	S	A		
	r A2		r B		Α	F A	F B	M DB	В			
7						\leftarrow					100 Trying	IBCF_B responds with a 100 Trying provisional response
8									\longrightarrow		INVITE	IBCF_B forwards INVITE to IMS_B
9							←				100 Trying	IMS_B responds with a 100 Trying provisional response
10								←			ENUM	IMS_A sends query to ENUM DB
11									\rightarrow		ENUM	ENUM DB sends response to IMS_A
12							←				INVITE	IMS_B forwards INVITE to IBCF_B
13									\longrightarrow		100 Trying	IBCF_B responds with a 100 Trying provisional response
14						←					INVITE	IBCF_B forwards INVITE to IBCF_A
15							\rightarrow				100 Trying	IBCF_A responds with a 100 Trying provisional response
16					←						INVITE	IBCF_A forwards INVITE to IMS_A
17						\rightarrow					100 Trying	IMS_A responds with a 100 Trying provisional response
												INVITE triggers the CFU IFC in IMS_A
18										\longrightarrow	INVITE	IMS_A forwards the INVITE to IMS_A AS
19					←		_				100 Trying	IMS_A AS optionally responds with the 100 Trying to IMS_A
												IMS_A AS applies the CDIV CFU procedure
20					←	_	-		-		181 Call is being	IMS_A AS indicates optionally to IMS_A that call has been forwarded
21						\rightarrow					181 Call is being	IMS_A indicates to IBCF_A that call has been forwarded
22							\rightarrow				181 Call is being	IBCF_A indicates to IBCF_B that call has been forwarded
23							_		\rightarrow		181 Call is being	IBCF_B indicates to IMS_B that call has been forwarded
24							←				181 Call is being	IMS_B indicates to IBCF_B that call has been forwarded
25						\leftarrow	\blacksquare				181 Call is being	IBCF_B indicates to IBCF_A that call has been forwarded
26					←						181 Call is being	IBCF_A indicates to IMS_A that call has been forwarded
27				-							181 Call is	IMS_A indicates to UE_B that call to
28											being	UE_A has been forwarded User B may be informed of call diversion
29					_						INVITE	IMS_A AS returns modified INVITE
30											100 Trying	including new request URI and history IMS_A responds with a 100 Trying
31											INVITE	provisional response IMS_A forwards the INVITE to UE_A2
32					→						100 Trying	UE_A2 optionally responds with a 100 Trying provisional response



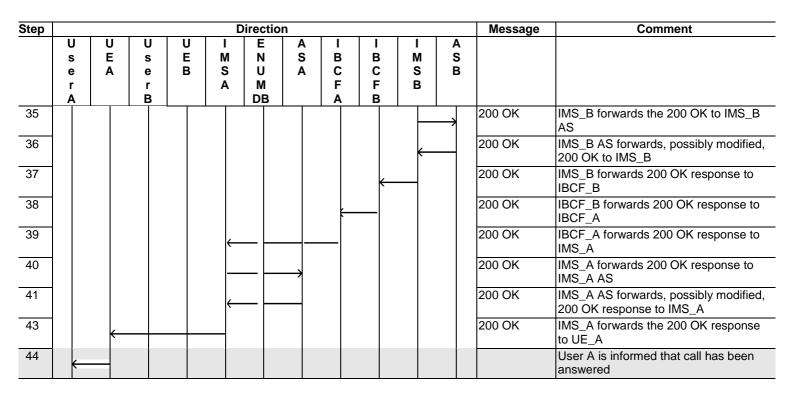
4.5.5.9 Supplementary Services OIP and OIR with AS

	Interoper	ability Test Description										
Identifier:	TD_IMS_SS_0009											
Summary:	IMS network supports properly application services based on the example of the OIP and OIR											
	supplementary services											
Configuration:	CF_INT_AS											
SUT:	IMS_B											
References:	Test Purpose	Specification Reference										
	TP_IMS_5097_01	TS 124 229 [1], clause 5.4.3.2 ¶11										
		(1 st numbered list)										
	TP_IMS_5108_03 TS 124 229 [1], clause 5.4.3.3 ¶5											
		(item 4 in 1 st numbered list)										
Use Case ref.:	UC_09_I											
Pre-test	 HSS of IMS_A and of IMS B is co 	onfigured according to table 1										
conditions:	 UE_A and UE_B have IP bearers 	s established to their respective IMS networks as per clause 4.2.1										
	 UE_A is registered in IMS_A usir 	ng userOIR_priv identity according to table 1										
	 UE_B is registered in IMS_B usin 	ng userOIP_priv identity according to table 1										
	IMS_A is configured to contact AS_A (OIR)											
	 UE_A is subscribed to OIR service 	pe ·										
	 IMS_B is configured to contact As 	S_B (OIP)										
	 UE_B is subscribed to OIP service 	ee .										

Test Sequence:	Ston									
rest Sequence:	Step	Hear A calle Hear D (i.e. year OID in IMC D)								
-	1	User A calls User B (i.e. userOIP in IMS_B)								
-	2	Verify that user B is informed of incoming call of User A and User A's identity is not displayed								
	3	Verify that user A is informed that UE_A is ringing								
-	4	User B answers call								
-	5	Verify that user A is informed that call has been answered								
-	6	Verify that user B is informed that the call is established								
	7	User B ends call								
_	8	Verify that user A is informed that call has ended								
	9	Verify that user B is informed that call has ended								
Conformance	Check									
Criteria:										
	1	TP_IMS_5097_01 in CFW step 120 (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 air 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 }								
-		TO THE FLOOR OF THE ACTION AT THE PROPERTY OF								
	2	TP_IMS_5108_03 in CFW step 16 (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 }								

Step					D	irectio	n					Message	Comment
	U s e r A	U E A	U s e r B	U E B	I M S A	E N U M DB	A S A	I B C F A	I B C F	I VI S B	A S B		
1		\rightarrow											User A calls User B
2					\rightarrow							INVITE	UE_A sends INVITE with the first SDP offer indicating all desired media and
3		\leftarrow										100 Trying	IMS_A responds with a 100 Trying provisional response
4						\rightarrow						ENUM	IMS B sends query to ENUM DB
5					\leftarrow	_						ENUM	ENUM DB sends response to IMS B
													INVITE triggers the OIR IFC in IMS_A
6							\rightarrow					INVITE	IMS_A forwards the INVITE to IMS_A AS
7					\leftarrow	_ _						100 Trying	IMS_A AS optionally responds with a 100 Trying provisional response

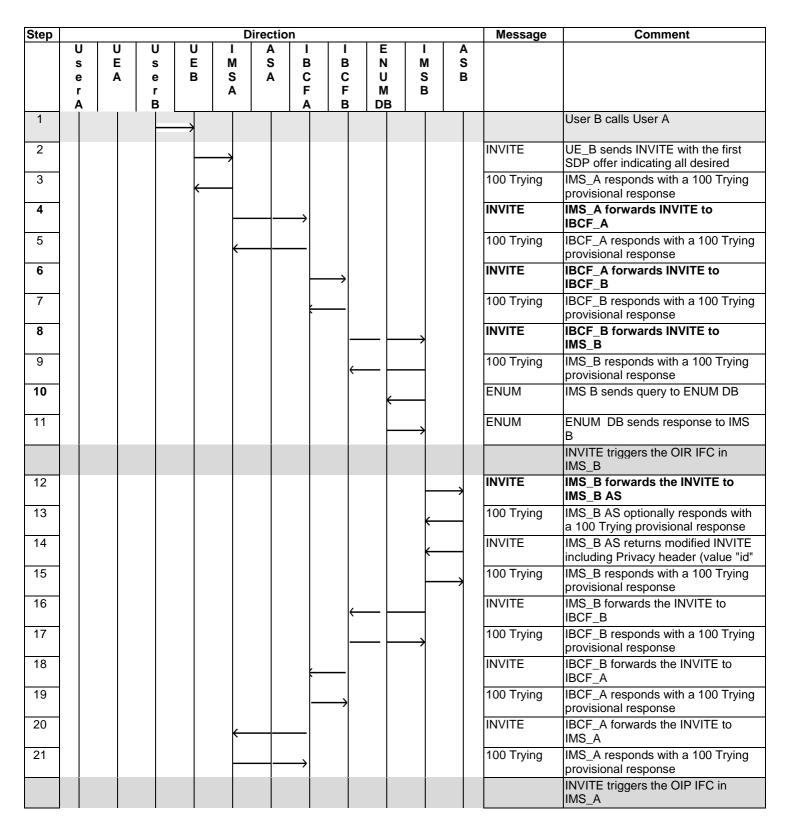
Step						Directio	n					Message	Comment
	U	U	U	U	ı	E	Α	I	<u> </u>	I	A		
	s e	E A	s e	E B	M S	N U	S	B	B C	M S	S B		
	r		r		Ā	M		F	F	В			
8	Α		В			DB		Α	В			INVITE	IMC A AC veture and differ INVITE
0					\leftarrow							IINVITE	IMS_A AS returns modified INVITE including Privacy header (value "id" or
9							\rightarrow					100 Trying	IMS_A responds with a 100 Trying provisional response
10								\longrightarrow				INVITE	IMS_A forwards the INVITE to
11					\leftarrow							100 Trying	IBCF_A responds with a 100 Trying provisional response
12									→			INVITE	IBCF_A forwards the INVITE to IBCF_B
13									_			100 Trying	IBCF_B responds with a 100 Trying provisional response
14										\rightarrow		INVITE	IBCF_B forwards the INVITE to IMS_B
15									←			100 Trying	IMS_B responds with a 100 Trying provisional response
													INVITE triggers the OIP IFC in IMS_B
16										\vdash	\rightarrow	INVITE	IMS_B forwards the INVITE to IMS_B AS
17										\leftarrow		100 Trying	IMS_B AS optionally responds with a 100 Trying provisional response
18										\leftarrow		INVITE	IMS_B AS returns modified INVITE including modified From and P-
19											\rightarrow	100 Trying	IMS_B responds with a 100 Trying provisional response
20				\leftarrow								INVITE	IMS_B forwards the INVITE to UE_B
21									_	\rightarrow		100 Trying	UE_B optionally responds with a 100 Trying provisional response
22			—										User B is informed of incoming call of User A, user A's identity is not
23										\rightarrow		180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has
24											\rightarrow	180 Ringing	IMS_B forwards the 180 Ringing to IMS_B AS
25										\leftarrow		180 Ringing	IMS_B AS forwards, possibly modified, 180 Ringing to IMS_B
26									\leftarrow	\dashv		180 Ringing	IMS_B forwards 180 Ringing response to IBCF_B
27									 _			180 Ringing	IBCF_B forwards 180 Ringing response to IBCF_A
28					\leftarrow							180 Ringing	IBCF_A forwards 180 Ringing response to IMS_A
29							\rightarrow					180 Ringing	IMS_A forwards 180 Ringing response to IMS_A AS
30					\leftarrow							180 Ringing	IMS_A AS forwards, possibly modified, 180 Ringing response to IMS_A
31		(180 Ringing	IMS_A forwards the 180 Ringing response to UE_A
32	-												User A is informed that UE_B is ringing
33				>									User B answers call
34										\rightarrow		200 OK	UE_B responds INVITE with 200 OK to indicate that the call has been



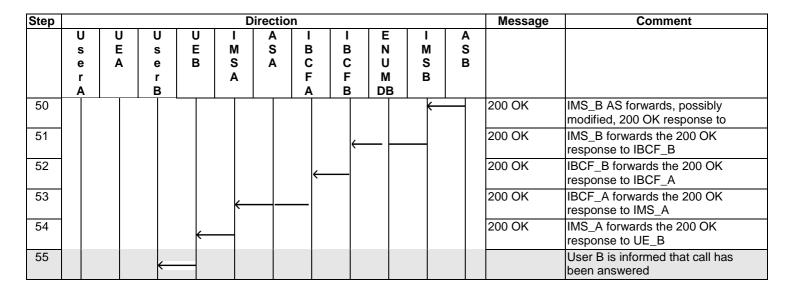
4.5.5.10 Supplementary Services OIP and OIR with AS in roaming

		Interoperability Tes	st Description									
Identifier:	TD_IMS_S	SS_0010										
Summary:			ication services based on the example of the OIP									
	and OIR su	R supplementary services										
Configuration:	CF_ROAM											
SUT:	IMS_A and	and IMS_B										
References:	Test Purp	ose	Specification Reference									
	TP_IMS_5	046_01	TS 124 229 [1], clause 5.2.6.3.3 ¶1 (1 st numbered list)									
	TP_IMS_5	097_09	TS 124 229 [1], clause 5.4.3.2 ¶11 (items 5 and 8 in 1 st numbered list)									
	TP_IMS_5	308_01	TS 124 229 [1], clause 5.4.4.2.2 ¶2									
	TP_IMS_5	308_02	TS 124 229 [1], clause 5.4.4.2.2 ¶2									
	TP_IMS_5	067_01	TS 124 229 [1], clause 5.2.7.2 ¶5									
Use Case ref.:	UC_09_R											
Pre-test conditions:	 UE_A a per clau UE_A is UE_B is table 1 IMS_A UE_A is IMS_B 	HSS of IMS_A and of IMS B is configured according to table 1 UE_A and UE_B have IP bearers established to their respective IMS networks as per clause 4.2.1 UE_A is registered in IMS_A using userOIP_priv identity according to table 1 UE_B is registered in IMS_B via IMS_A using userOIR_priv identity according to table 1 IMS_A is configured to contact AS_A (OIP) UE_A is subscribed to OIP service IMS_B is configured to contact AS_B (OIR) UE_B is subscribed to OIR service										
Test Sequence:	Step 1 User B calls User A (i.e. userOIP in IMS_A) 2 Verify that user A is informed of incoming call of User B and User B's identity is not displayed 3 Verify that user B is informed that UE_A is ringing 4 User A answers call 5 Verify that user B is informed that call has been answered 6 Verify that user A is informed that the call is established 7 User A ends call											

		Interoperability Test Description
	8	Verify that user B is informed that call has ended
	9	Verify that user A is informed that call has ended
Conformance	Check	
Criteria:	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 an additional via_neader containing (the P-CSCF_via_port_number and
		(the P-CSCF-FQDN_address or
		the P-CSCF-IP_address)) of IMS_A and
		containing an additional topmost Record-Route_header
		indicating (the P-CSCF_port_number
		'where it awaits subsequent requests' from UE_A and
		(the P-CSCF-FQDN_address or
		the P-CSCF-IP_address)) of IMS_A and
		not containing P-Preferred-Identity_header and
		containing a P-Asserted-Identity_header
		containing an address of UE_B and
		containing a P-Charging-Vector_header
		containing an icid-value_parameter }
		}
	2	TP_IMS_5097_09 in CFW step 12 (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 Route_header indicating the SIP_URI of AS_B and
		containing a P-Charging-Function-Addresses_header and
		containing a P-Charging-Partition-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) }
		}
	3	TP_IMS_5308_01 in CFW step 30 (180 ringing)
		ensure that {
		when { IMS_A receives a 180 response from UE_A
		containing a P-Charging-Vector_header
		including an access-network-charging-info_parameter
]}
		then { IMS_A sends the 180 response to AS_A
		containing a P-Charging-Vector_header
		including an access-network-charging-info_parameter
	_	TD_INC_5000_00 in CDM step 44 (000 CM)
	3	TP_IMS_5308_02 in CFW step 44 (200 OK)
		ensure that {
		when { IMS_A receives a 200 response from UE_A
		containing a P-Charging-Vector_header including an access-network-charging-info_parameter
		induding an access-network-charging-fillo_parameter
		then { IMS_A sends the 200 response to AS_A
		containing a P-Charging-Vector_header
		including an access-network-charging-info_parameter
		<u>U</u>



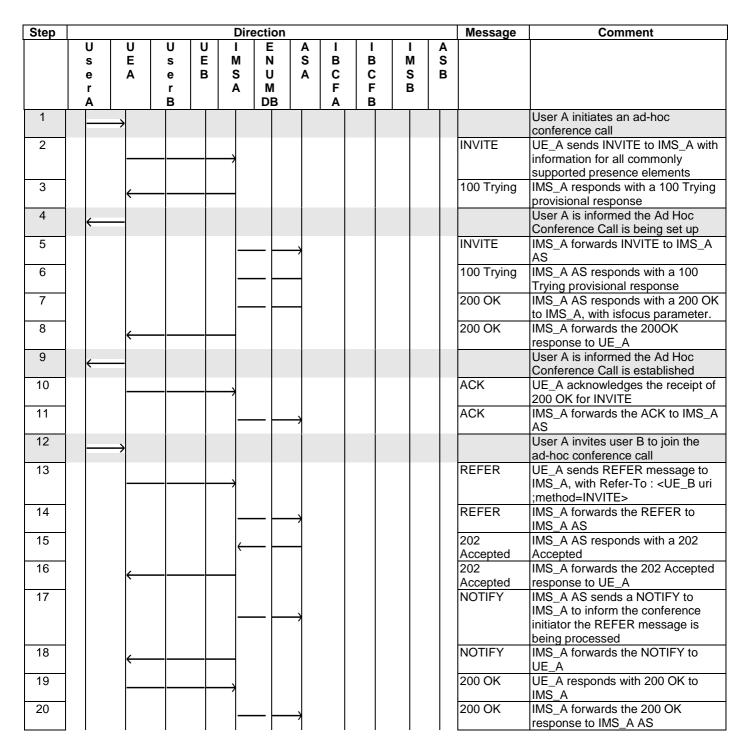
Step				Direc	tion						Message	Comment
		J U E s	U E	I A		I B	E N			4 6		
	e /	A e	В	S A		C	U		S E B	3		
00	A	B			A	B	DI	-			IND /ITE	INAC A fewered the INV/ITE to
22											INVITE	IMS_A forwards the INVITE to IMS_A AS
23				←—							100 Trying	IMS_A AS optionally responds with a 100 Trying provisional response
24											INVITE	IMS_A AS returns modified INVITE including modified From and P-
25				\longrightarrow							100 Trying	IMS_A responds with a 100 Trying provisional response
26											INVITE	IMS_A forwards the INVITE to UE_A
27											100 Trying	UE_A optionally responds with a 100 Trying provisional response
28												User A is informed of incoming call of User B, user B's identity is not
29				\rightarrow							180 Ringing	UE_A responds to initial INVITE with 180 Ringing to indicate that it
30											180 Ringing	IMS_A forwards the 180 Ringing to IMS_A AS
31											180 Ringing	IMS_A AS forwards, possibly modified, 180 Ringing to IMS_A
32					─						180 Ringing	IMS_A forwards 180 Ringing response to IBCF_A
33						\longrightarrow					180 Ringing	IBCF_A forwards 180 Ringing response to IBCF_B
34									•		180 Ringing	IBCF_B forwards 180 Ringing response to IMS_B
35									\longrightarrow		180 Ringing	IMS_B forwards 180 Ringing response to IMS_B AS
36											180 Ringing	IMS_B AS forwards, possibly modified, 180 Ringing response to
37						,					180 Ringing	IMS_B forwards the 180 Ringing response to IBCF_B
38					•	(180 Ringing	IBCF_B forwards the 180 Ringing response to IBCF_A
39											180 Ringing	IBCF_A forwards the 180 Ringing response to IMS_A
40			←								180 Ringing	IMS_A forwards the 180 Ringing response to UE_B
41		←										User B is informed that UE_A is ringing
42												User A answers call
43				\rightarrow							200 OK	UE_A responds INVITE with 200 OK to indicate that the call has been
44											200 OK	IMS_A forwards the 200 OK to IMS_A AS
45				—							200 OK	IMS_A AS forwards, possibly modified, 200 OK to IMS_A
46											200 OK	IMS_A forwards 200 OK response to IBCF_A
47						\longrightarrow					200 OK	IBCF_A forwards 200 OK response to IBCF_B
48								;			200 OK	IBCF_B forwards 200 OK response
49									\longrightarrow		200 OK	to IMS_B IMS_B forwards 200 OK response
					Į							to IMS_B AS



4.5.5.11 Ad-hoc Conference Call service

		Interoperability Test Desc	ription								
Identifier:		CONF_0001									
Summary:	IMS netw	ork handles subsequent INVITEs,	UPDATEs, REFERs and NOTIFYs								
	correctly during Ad-Hoc Conference calls										
Configuration:	CF_INT_	CONF_CALL									
SUT:	IMS_A										
References:	Test Pur		Specification Reference								
	TP_IMS_	5121_02	TS 124 229 [1], clause 5.4.3.3 ¶123								
			(9 th numbered list)								
Use Case ref.:	UC_16										
conditions:	 HSS of IMS_A and of IMS B is configured according to table 1 UE_A and UE_B have IP bearers established to their respective IMS networks per clause 4.2.1 UE_A is registered in IMS_A using any user identity IMS_A is configured to contact AS_A (CONF) UE_B is registered in IMS_B using any user identity IMS_B is configured to contact AS_B (CONF) User A and B are subscribed to CONF service User A is pre-provisioned with conference-factory URI in IMS_A 										
Test Sequence:	2 3 4 5	factory URI Verify that User A is informed the Verify that User A is informed the User A invites User B to join the Verify that User B is informed of Conference Call Verify that User A is informed that User B joins the Conference Call	incoming invitation from User A to join the at User B is being alerted								
	9	User B leaves the Conference Ca	all at the Conference Call has ended								

Interoperability Test Description										
Conformance Criteria:	Check									
	1	TP_IMS_5121_02 in CFW in step 36 & 46 (200 OK): ensure that { when { UE_B sends a 1xx or 2xx_response to UE_A } then { IMS_A receives the 1xx or 2xx_response containing a P-Charging-Vector_header not containing a access-network-charging-info_parameter and not containing a P-Access-Network-Info_header } }								



Step					Dire	ction							Message	Comment
	U	Ū	U	Ū	I	E	A			Ĺ	I	A		
	s e	E A	s e	E B	M S	N U	S	B	E		M S	S B		
	r		r		A	M		F	F	=	В			
21	A		В		1	DB		Α	E	3	1		INVITE	IMS_A AS sends INVITE to UE_B
21													IIIVII L	with conference-factory URI
														(received in the REFER message
22													100 Trying	from UE A) IMS_A responds with a 100 Trying
					-	_	\rightarrow							provisional response
23					-	→							ENUM	IMS_A sends query to ENUM DB
24					\leftarrow	_							ENUM	ENUM DB sends response to IMS_A
25								,					INVITE	IMS_A forwards the INVITE to
														IBCF_A
26					\leftarrow	_							100 Trying	IBCF_A responds with a 100 Trying provisional response
27													INVITE	IBCF_A forwards the INVITE to
- 00										1			100 Tmd	IBCF_B
28									\leftarrow	1			100 Trying	IBCF_B responds with a 100 Trying provisional response
29											_		INVITE	IBCF_B forwards the INVITE to
30											1		100 Trying	IMS_B IMS_B responds with a 100 Trying
30										\leftarrow			100 Hyllig	provisional response
31				—	_	_	_ _						INVITE	IMS_B forwards the INVITE to
32													100 Trying	UE_B UE_B responds with a 100 Trying
											\rightarrow		100 1171119	provisional response
33														User B is informed of incoming
														invitation from User A to join the Conference Call
34						-	-	_			\rightarrow		180 Ringing	UE_B sends a 180 ringing to IMS_B
35										<u></u>			180	IMS_B forwards the 180 ringing to
36													Ringing 180	IBCF_B IBCF_B forwards the 180 ringing
30									\longleftarrow				Ringing	to IBCF_A
37					\leftarrow	_	_						180	IBCF_A forwards the 180 ringing
38													Ringing 180	to IMS_A IMS_A forwards the 180 ringing to
						_	7						Ringing	IMS_A AS
39													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
40		\leftarrow											NOTIFY	IMS_A forwards the NOTIFY to UE_A
41														User A is notified that User B is being invited to join the call
42)								200 OK	UE_A responds with 200 OK to IMS_A for NOTIFY
43						_	\rightarrow						200 OK	IMS_A forwards the 200 OK response to IMS_A AS
44						_	- -			-	\rightarrow		200 OK	UE_B responds with 200 OK to IMS_B for INVITE
45										<u></u>	_		200 OK	IMS B forwards the 200 OK response to IBCF_B
46										-			200 OK	IBCF_B forwards the 200 OK response to IBCF_A
47													200 OK	IBCF_A forwards the 200 OK
														response to IMS_A

Step					Direction	n					Message	Comment
	U	U		U	I E	Α	I	I	I	Α		
	S	E	S		M N	S	B	B	M	S B		
	e r	Α	e r	_	S U A M		F	F	S B	В		
	Ä		В				Ä	В				
48						- 1					200 OK	IMS_A forwards the 200 OK
												response to IMS_A AS
49				→								User B joins the conference
50					ļ				→		ACK	UE_B acknowledges the 200 OK
51											ACK	for INVITE IMS B forwards the ACK to
51								\leftarrow				IBCF_B
52							k				ACK	IBCF_B forwards the ACK to IBCF_A
53					←						ACK	IBCF_A forwards the ACK to IMS_A
54						─					ACK	IMS_A forwards the ACK to IMS_A AS
55											NOTIFY	AS_A sends NOTIFY to UE_A to
					├							inform it has successfully joined
											NOTIEV	the conference
56											NOTIFY	IMS_A forwards NOTIFY to UE_A
57	←	_										User A is alerted that User B has joined the conference
58											200 OK	UE_A sends 200 OK response for
					1							NOTIFY
59						─					200 OK	IMS_A forwards the 200 OK response to IMS_A AS
60				>								User B leaves the conference
61											BYE	UE_B sends BYE to IMS_B to
62											BYE	leave the conference IMS_B forwards the BYE to
												IBCF_B
63							K	\leftarrow			BYE	IBCF_B forwards the BYE to IBCF_A
64					←						BYE	IBCF_A forwards the BYE to IMS_A
65						\longrightarrow					BYE	IMS_A forwards the BYE to IMS_A AS
66											200 OK	IMS_A AS releases resources for
					├							this conference caller and sends a
07											000 014	200 OK response for BYE
67							\longrightarrow				200 OK	IMS_A forwards the 200 OK response to IBCF_A
68							}	─			200 OK	IBCF_A forwards the 200 OK response to IBCF_B
69									\longrightarrow		200 OK	IBCF_B forwards the 200 OK response to IMS_B
70				<u></u>	<u> </u>						200 OK	IMS_B forwards the 200 OK
71				,								response to UE_B User B is informed that the
											NOT:=\:	conference has ended
72					←						NOTIFY	AS_A sends NOTIFY to IMS _A to inform UE_A that UE_B has left
72											NOTICY	the conference
73											NOTIFY	IMS_A forwards NOTIFY to UE_A
74	←											User A is notified that user B has left the conference
75											200 OK	UE_A sends a 200 OK response
76											200 OK	for NOTIFY IMS_A forwards the 200 OK
, 0						\longrightarrow					200 OK	response to IMS_A AS

4.5.6 Presence

The test descriptions for the presence service are defined in TS 102 901 [17].

4.5.7 IPTV

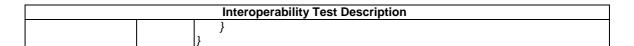
4.5.7.1 IPTV registration and Service Attachment. Push mode

		Interoperability Test Descr	ription					
Identifier:		PTV_0001						
Summary:	IMS netwo	ork supports properly IPTV registra	ation and service attachment in Push mode					
Configuration:	CF_IPTV							
SUT:	IMS_A							
References:	Test Purp	ose	Specification Reference					
	TP_IMS_5		TS 124 229 [1], clause 5.4.1.2.2 F ¶15					
			(before NOTE 3)					
	TP_IMS_5	308_02	TS 124 229 [1], clause 5.4.4.2.2 ¶2					
Use Case ref.:								
Pre-test	 HSS of 	IMS_A is configured according to	table 1					
conditions:			espective IMS networks as per clause 4.2.1					
		s registered in IMS_A using userI						
		is configured to send a third party						
		not configured for topology hiding						
	1 11VIO_7	The cominguiou for topology maining						
Test Sequence:	Step							
rest ocquerioc.	29	Verify that user A receives service	e attachment information					
	23	verily that user A receives service	e attachment information					
Conformance	Check							
Criteria:	1	TP_IMS_5206_01 in CFW step 2	2 (DECISTED)					
Oriteria.	•	ensure that {	3 (REGISTER)					
		when { IMS_A receives a protect	oted REGISTER					
		containing an Authorizati						
		•						
		containing a integrity protected parameter indicating (yes or						
		tls-pending or						
		tls-yes or						
		ip-assoc-pending or	•					
		ip-assoc-yes)}						
		then { IMS_A sends a third party	v register to AS A					
		containing a P-Access-						
		containing a P-Visited-						
		}	Notificial 12 floader					
)						
	2	TP_IMS_5308_02 in CFW step 2	28 (200 OK)					
	_	ensure that {	.5 (255 511)					
		when { IUT receives a 200_resp	oonse from UF_A					
		containing a P-Charging-						
			twork-charging-info_parameter					
		}						
		then { IUT sends the 200_respo	onse to AS A					
		containing a P-Charging-						
			twork-charging-info_parameter					
		}						
), ´						
L	ı	IJ						

Step		Direction								Comment
	U	U	U	U	I	Α	I	Α		
	S	E	S	E	M	S	M	S		
	е	Α	е	В	S	Α	S	В		
	r		r		Α		В			
	A		В							
										IMS_A matches the iFC of the service
										profile belong to the user, and find out the
										AS (SDF) that user has subscribed
23									REGISTER	IMS_A sends a REGISTER to AS_A
						1				(third party registration)
24					\leftarrow				200 OK	AS_A responds with 200 OK
25									MESSAGE	AS_A sends a MESSAGE containing the
										service attachment information
26		\leftarrow							MESSAGE	IMS_A forwards the MESSAGE to UE_A
27					\longrightarrow				200 OK	UE_A responds with 200 OK
28									200 OK	IMS_A forwards the 200 OK response
						\longrightarrow				to AS_A
29										UE receives service attachment
										information

4.5.7.2 IPTV registration and Service Attachment. Pull mode.

		Interoperability Tes	t Description					
Identifier:	TD IMS	IPTV_0002						
Summary:			registration and service attachment in Pull mode					
Configuration:	CF IPTV		3					
SUT:	IMS_A							
References:	Test Purp	oose	Specification Reference					
	TP_IMS_		TS 124 229 [1], clause 5.4.3.2 ¶11					
		_	(items 5 and 8 in 1 st numbered list)					
	TP_IMS_	5308_02	TS 124 229 [1], clause 5.4.4.2.2 ¶2					
Use Case ref.:								
Pre-test	 HSS o 	f IMS_A is configured acco	rding to table 1					
conditions:			to its respective IMS networks as per clause 4.2.1					
	UE_A is registered in IMS_A using userIPTV according to table 1							
		IMS_A, AS_A support pull						
	 IMS A 	not configured for topology	y hiding					
	_	1 0,						
Test Sequence:	Step							
	31	Verify that user A receives	s service attachment information					
Conformance	Check							
Criteria:	1	1 TP_IMS_5097_14 in CFW step 24 (SUBSCRIBE):						
		ensure that {						
		when { IMS_A sends the S						
		then { AS_A receives the						
		containing a Route						
		indicating the SII						
			arging-Function-Addresses_header					
			arging-Vector_header					
			ioi_parameter indicating IMS_A and					
			erm-ioi_parameter and					
		including access-	network-charging-info)}					
		} TD 1140 5000 00: 054	/					
	2	TP_IMS_5308_02 in CFW	step 30 (200 OK)					
		ensure that {	20 raananaa fram LIC A					
		when { IUT receives a 20	oo_response from oE_A arging-Vector_header					
			arging-vector_neader ess-network-charging-info_parameter					
			ess-network-charging-inio_parameter					
		then { IUT sends the 200) response to AS A					
			arging-Vector_header					
			ess-network-charging-info_parameter					
		molading an acc	oso notwork oranging into_paramotor					

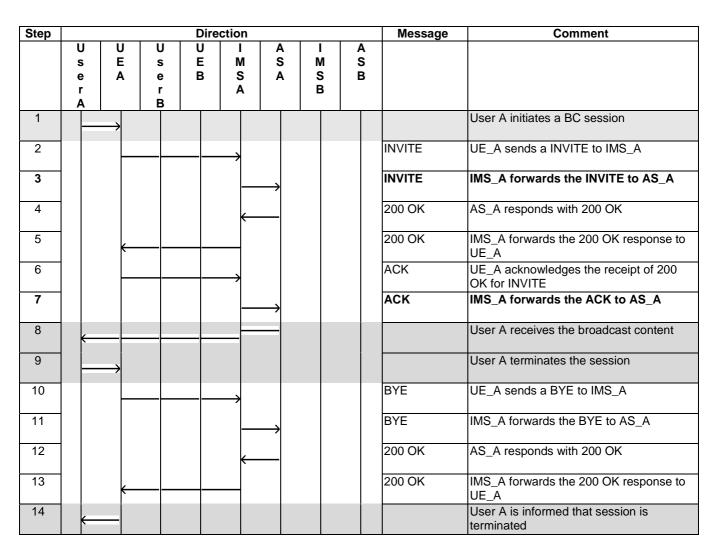


Step				Dire	ction				Message	Comment
	U s e r A	U E A	U s e r B	U E B	I M S A	A S A	I M S B	A S B		
										UE retrieves the PSI/address of AS_A (SDF)
23					\rightarrow				SUBSCRIBE	UE_A sends a SUBSCRIBE for "ua-profile" event to IMS_A
24						\longrightarrow			SUBSCRIBE	IMS_A forwards the SUBSCRIBE to AS_A
25					←	_			200 OK	AS_A responds with 2000K
26		\leftarrow							200 OK	IMS_A forwards the 200 OK response to UE_A
27					←	_			NOTIFY	AS_A sends a NOTIFY for the service attachment information to IMS_A
28		\leftarrow							NOTIFY	IMS_A forwards the NOTIFY to UE_A
29					\rightarrow				200 OK	UE_A responds with 200 OK
30						\longrightarrow			200 OK	IMS_A forwards the 200 OK response to AS_A
31										UE receives service attachment information

4.5.7.3 BC session

	Interoperabilit	y Test Description						
Identifier:	TD_IMS_IPTV_0003	,						
Summary:	IMS network supports properly IPTV Broadcast session							
Configuration:	CF_IPTV							
SUT:	IMS_A							
References:	Test Purpose	Specification Reference						
	TP_IMS_5108_03	TS 124 229 [1], clause 5.4.3.2 ¶5 (item 4 in 1 st numbered list)						
	TP_IMS_5107_02	TS 124 229 [1], clause 5.4.3.2 ¶119 (item 1 in 8 th numbered list)						
Use Case ref.:	UC_19							
Pre-test conditions:	 UE_A has IP bearers estabelies UE_A is registered in IMS_ UE_A has done IPTV registered pull mode 	 UE_A has IP bearers established to its respective IMS networks as per clause 4.2.1 UE_A is registered in IMS_A using userIPTV according to table 1 UE_A has done IPTV registration and service attachment procedures using push or 						
Test Sequence:	Step 1 User A initiates a BC session 11 Verify that user A receives the broadcast content 12 User A terminates the session 19 Verify that user A is informed that session is terminated							

		Interoperability Test Description
Conformance	Check	
Criteria:	1	TP_IMS_5108_03 in CFW step 3 (INVITE) ensure that { when { IUT receives an initial INVITE from IMS_A} then { IUT sends the initial INVITE to AS_A containing a topmost Route_header indicating the SIP_URI of AS_A and containing a Route_header indicating the S-CSCF SIP_URI of IMS_A 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 } }
	2	TP_IMS_5107_02 in CFW step 7 (ACK) ensure that { when { UE_A sends ACK to addressed to UE_B} then { IMS_B receives the ACK not containing a Route_header indicating the S-CSCF_SIP_URI of IMS_A and not containing a P-Access-Network-Info_header } }



4.5.7.4 CoD session. Establishing content control channel and content delivery channels using RTSP Method 1

		Interoperability Test D	escription					
Identifier:		IPTV_0004						
Summary:		ork supports properly IPTV co	ntent on demand session					
Configuration:	CF_IPTV							
SUT:	IMS_A							
References:	Test Purp	oose	Specification Reference					
	TP_IMS_5	5108_03	TS 124 229 [1], clause 5.4.3.2 ¶5					
			(item 4 in 1 st numbered list)					
	TP_IMS_	5107_02	TS 124 229 [1], clause 5.4.3.2 ¶119					
			(item 1 in 8 th numbered list)					
Use Case ref.:	UC_20							
Pre-test	HSS	of IMS_A is configured accord	ing to table 1					
conditions:			its respective IMS networks as per					
		e 4.2.1						
	• UE A	A is registered in IMS_A using	userIPTV according to table 1					
			nd service attachment procedures using push					
		Il mode	na serrice anaermieri procedures demig pueri					
			ured to establish content control channel and					
		ent delivery channels using RT						
		A not configured for topology						
		, that comigation to topology	9					
Test Sequence:	Step							
. con coquionico.	1	User A initiates a CoD session	n (content selection)					
	26	Verify that user A starts rece						
	27	User A terminates the session						
	36	Verify that user A is informed						
	30	verily that user 7 is informed	that 3033ion is terminated					
Conformance	Check							
Criteria:	1	TP_IMS_5108_03 in CFW st	en 3 (INIVITE)					
Oritoria.		ensure that {	ep 3 (INVITE)					
		when { IUT receives an initial	al INVITE from IMS A					
		then { IUT sends the initial I						
		containing a topmost						
		indicating the SIP_						
		containing a Route_he						
			CF SIP_URI of IMS_A and					
		containing a P-Chargi						
		including a orig-ioi_j						
			r_identifier of IMS_A and					
		not including a term						
		}	_,					
	2	TP_IMS_5107_02 in CFW st	ep 11 (ACK)					
		ensure that {						
		when { UE_A sends ACK to	addressed to UE_B}					
		then { IMS_B receives the						
		not containing a Rou						
1	1	•	SCF_SIP_URI of IMS_A and					
		indicating the 3-0	SCF_SIF_UNI ULIVIS_A ALIU					
			ccess-Network-Info_header					

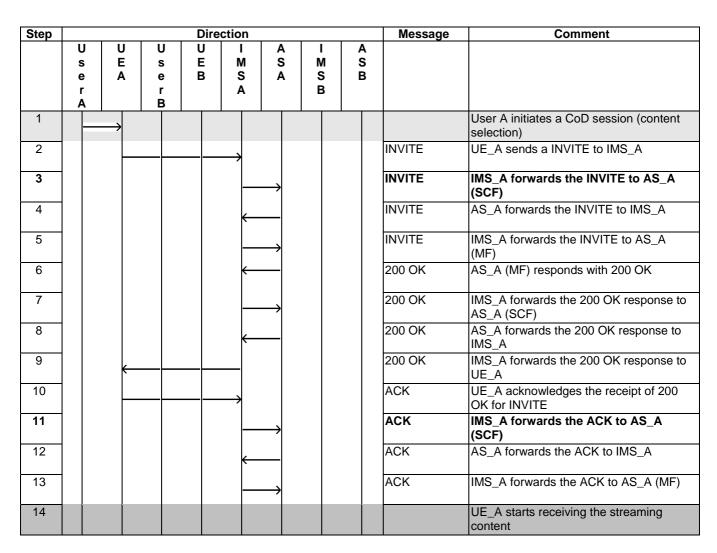
Step			ı	Directio	n				Message	Comment
	U s	U E		U E 1	I M	A S	I M	A S		
	е	Ā	e l	в :	S	Ä	S	В		
	r A		r B		A		В			
1		→								User A initiates a CoD session (content selection)
2				,					INVITE	UE_A sends a INVITE to IMS_A
3						→			INVITE	IMS_A forwards the INVITE to AS_A (SCF)
4						_			INVITE	AS_A forwards the INVITE to IMS_A
5						\rightarrow			INVITE	IMS_A forwards the INVITE to AS_A (MF)
6					←				200 OK	AS_A (MF) responds with 200 OK
7						\rightarrow			200 OK	IMS_A forwards the 200 OK response to AS_A (SCF)
8									200 OK	AS_A forwards the 200 OK response to IMS_A
9									200 OK	IMS_A forwards the 200 OK response to UE_A
10									ACK	UE_A acknowledges the receipt of 200 OK for INVITE
11						\rightarrow			ACK	IMS_A forwards the ACK to AS_A (SCF)
12					←				ACK	AS_A forwards the ACK to IMS_A
13						\rightarrow			ACK	IMS_A forwards the ACK to AS_A (MF)
										UE_A sets up RTSP with AS_A (MF)
14									INVITE	UE_A sends reINVITE message indicating media attribute "a=recvonly"
15						\rightarrow			INVITE	IMS_A forwards the reINVITE to AS_A
16						_			INVITE	AS_A forwards the reINVITE to IMS_A
17						\rightarrow			INVITE	IMS_A forwards the reINVITE to AS_A (MF)
18									200 OK	AS_A (MF) responds with 200 OK
19						\rightarrow			200 OK	IMS_A forwards the 200 OK response to AS_A (SCF)
20					←				200 OK	IMS_B forwards the 200 OK response to IMS_A
21									200 OK	IMS_A forwards the 200 OK response to UE_A
22									ACK	UE_A acknowledges the receipt of 200 OK for reINVITE
23						\rightarrow			ACK	IMS_A forwards the ACK to AS_A (SCF)
24					←—				ACK	AS_A forwards the ACK to IMS_A
25						\rightarrow			ACK	IMS_A forwards the ACK to AS_A (MF)
26	←									User A starts receiving the streaming content
27)								User A terminates the session

Step		Direction								Comment
	U s e r A	U E A	U s e r B	U E B	I M S A	A S A	M S B	A S B		
28					\rightarrow				BYE	UE_A sends a BYE to IMS_A
29					_	\rightarrow			BYE	IMS_A forwards the BYE to AS_A (SCF)
30					←				BYE	AS_A forwards the BYE to IMS_A
31						\rightarrow			BYE	IMS_A forwards the BYE to AS_A (MF)
32					\leftarrow				200 OK	AS_A (MF) responds with 200 OK
33						\rightarrow			200 OK	IMS_A forwards the 200 OK response to AS_A (SCF)
34					\leftarrow				200 OK	IMS_B forwards the 200 OK response to IMS_A
35		—			_				200 OK	IMS_A forwards the 200 OK response to UE_A
36	\leftarrow									User A is informed that session is terminated

4.5.7.5 CoD session. Establishing content control channel and content delivery channels using RTSP Method 2

	Interoperability [*]	Test Description							
Identifier:	TD_IMS_IPTV_0005								
Summary:	IMS network supports properly IPTV content on demand session								
Configuration:	CF_IPTV								
SUT:	IMS_A								
References:	Test Purpose	Specification Reference							
	TP_IMS_5108_03	TS 124 229 [1], clause 5.4.3.2 ¶5							
		(item 4 in 1 st numbered list)							
	TP_IMS_5107_02	TS 124 229 [1], clause 5.4.3.2 ¶119							
		(item 1 in 8 th numbered list)							
Use Case ref.:	UC_21								
Pre-test conditions:	 HSS of IMS_A is configured according to table 1 UE_A has IP bearers established to its respective IMS networks as per clause 4.2.1 UE_A is registered in IMS_A using userIPTV UE_A has done IPTV registration and service attachment procedures using or pull mode UE_A, IMS_A and AS_A are configured to establish content control channels content delivery channels with RTSP method 2 IMS_A not configured for topology hiding 								
Toot Common or	Ston								
Test Sequence:	Step	acceion (content coloction)							
	<u> </u>	session (content selection)							
	32 Verify that user A start	ts receiving the streaming content							

		Interoperability Test Description
Conformance	Check	
Criteria:	1	TP_IMS_5108_03 in CFW step 3 (INVITE) ensure that { when { IUT receives an initial INVITE from IMS_A} then { IUT sends the initial INVITE to AS_A containing a topmost Route_header indicating the SIP_URI of AS_A and containing a Route_header indicating the S-CSCF SIP_URI of IMS_A and containing a P-Charging-Vector_header including a orig-ioi_parameter indicating operator_idenoreden
	2	not including a term-ioi_parameter } } TP_IMS_5107_02 in CFW step 11 (ACK) ensure that { when { UE_A sends ACK to addressed to UE_B} then { IMS_B receives the ACK not containing a Route_header indicating the S-CSCF_SIP_URI of IMS_A and not containing a P-Access-Network-Info_header } }



4.5.7.6 Request for Network PVR offline capture in home network

Interoperability Test Description									
Identifier:	TD_IMS_IP	TV_0006							
Summary:	IMS network	k supports properly N-PVR offline	e capture requests						
Configuration:	CF_IPTV								
SUT:	IMS_A								
References:	Test Purpo	se	Specification Reference						
	TP_IMS_51	08_04	TS 124 229 [1], clause 5.4.3.3 ¶5 (item 4 in 1 st numbered list)						
Use Case ref.:	UC_22		(item 4 in 1 Humbered list)						
Ose Case lel	00_22								
Pre-test conditions:	 HSS of IMS_A is configured according to table 1 UE_A has IP bearers established to its respective IMS networks as per clause 4.2.1 UE_A is registered in IMS_A using userIPTV according to table 1 UE_A has done IPTV registration and service attachment procedures using either push or pull mode IMS_A not configured for topology hiding 								
Test Sequence:		User A requests to record a live p Verify that user A is informed that	rogramme that has not started yet recording has started						
Conformance	Check								
Criteria:		TP_IMS_5108_04 in CFW step 3 ensure that { when { IMS_A receives a MESS then { IMS_A sends the MESSA containing a topmost Rouindicating the SIP_URI containing a Route_head indicating the S-CSCF_containing a P-Charging-including a orig-ioi_paraindicating operator_ide not including a term-ioi_s	AGE from UE_A } GE to AS_A ute_header of AS_A and er SIP_URI of IMS_A and Vector_header ameter entifier of IMS_A and						

Step				Dire	ction				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	M S B	A S B		
1		\rightarrow								User a requests to record a live programme that has not started yet
2					\longrightarrow				MESSAGE	UE_A sends a MESSAGE to IMS_A
3						\rightarrow			MESSAGE	IMS_A forwards the MESSAGE to AS_A
4					←				200 OK	AS_A responds with 200 OK
5		←							200 OK	IMS_A forwards the 200 OK response to UE_A
6	-	-								User A is informed that recording has started

4.5.8 IMS-PSTN Interoperability

4.5.8.1 IMS-to-PSTN call

4.5.8.1.1 ENUM Query - IMS-to-PSTN call

		Interoperability Test Desc	cription				
Identifier:	TD_IMS_E	NUM_0002					
Summary:	ENUM que	ery should result in return of NAF	TR with correct Tel URI				
Configuration:	CF_INT_C	ALL					
SUT:	ENUM_A	and ENUM_DB					
References:	Test Purp	ose	Specification Reference				
	TP_IMS_E	NUM_01	TS 124 229 [1], clause 5.4.3.2 ¶11 (item 10 in 1 st numbered list)				
Use Case ref.:	UC_I_23						
Pre-test conditions:	IMS_AHSS cUE_A	A DB is configured according to A is configured to support ENUM of IMS_A and of IMS B is configu- has IP bearer established to its is registered in IMS_A using an	red according to table 1 respective IMS networks as per clause 4.2.1				
Toot Coguenes	Cton						
Test Sequence:	Step	Lloor A collo year D					
	2	User A calls user B	in a call of year D				
		User B is informed about incomi	ng call of user B				
Conformance	Check						
Criteria:	1	TP_IMS_ENUM_01 in CFW ste	n 4 (NIADTE Bonnonco):				
Criteria.	•	ensure that {	p 4 (INAP I R Response).				
		when { UE_A sends an initial li	NVITE for LIE B to IMS A				
		containing a Requ					
		indicating a Tel					
		and IMS_A sends a NAPT					
			I derived_from the Tel_URI_E.164_Number				
		3	ractivea_from the ref_orki_E.104_tvamber				
		, then { ENUM_DB sends a NAF	PTR Response to IMS A				
			TR_Resource_Record				
			TTL of the NAPTR_record				
		containing the s					
		indicating E2					
			regular_expressiob				
		indicating !^(.					
			SIP_URI of UE_B				
			ackreference (\1) for the user part				
			omain name for the host part				
		containing SIP_	URI_parameters 'if applicable' }				
		}					

Step			D	irectio	n			Message	Comment
	U	U	I	Е	M	Р	U		
	S	Ε	M	N	G	S	S		
	е	Α	S	U	С	Т	е		
	r		Α	М	F	N	r		
	Α			DB			В		
1		\rightarrow							User A calls User B
2			\rightarrow					INVITE	UE_A sends INVITE with the first SDP offer indicating all desired medias and codecs that
3			_	\rightarrow				ENUM	IMS_A sends query to ENUM DB
4			\leftarrow	-				ENUM	ENUM DB sends response to IMS_A

Step			D	irectio	on			Message	Comment
	U s e r A	U E A	I M S A	E N U M DB	M G C F	P S T N	U s e r B		
5		←						100 Trying	IMS_A responds with a 100 Trying provisional response
6					\rightarrow			INVITE	IMS_A forwards INVITE to MGCF
7			\leftarrow					100 Trying	MGCF responds with a 100 Trying provisional response
8			←		_			183 Session Progress	MGCF responds with 183 Session Progress response
9		—						183 Session Progress	IMS_forwards 183 Session Progress response to UE_A
10			\rightarrow					PRACK	UE_A sends PRACK to IMS_A
11					\rightarrow			PRACK	IMS_A forwards PRACK to MGCF
12			←					200 OK (PRACK)	MGCF responds with 200 OK response to IMS_A
13		—						200 OK (PRACK)	IMS_A forwards 200 OK response to UE_A
14						\rightarrow		IAM	MGCF sends IAM to PSTN
15							\rightarrow		User B is informed of incoming call of User A

4.5.8.1.2 Normal Call, PSTN user clears call

		Interoperability Te	st Description						
Identifier:	TD_IMS_	_PSTN_0001							
Summary:	Outgoing	call to PSTN, PSTN user	clears call						
Configuration:	CF_PSTI	_PSTN							
SUT:	IMS_A ar	d MGCF							
References:	Test Pur	pose	Specification Reference						
	TP_IMS_	MGCF_02	TS 124 229 [1], clause 5.5.3.1.2						
	TP_IMS_	MGCF_03	TS 124 229 [1], clause 5.5.3.1.2						
	TP_IMS_	MGCF_06	TS 124 229 [1], clause 5.5.3.2.2						
			TS 129 163 [18], clause 7.2.3.1.4						
	TP_IMS_	MGCF_07	TS 124 229 [1], clause 5.4.1.2.2						
			TS 129 163 [18], clause 7.2.3.1.5						
	TP_IMS_	MGCF_08	TS 124 229 [1], clause 5.5.4.1						
			TS 129 163 [18], clause 7.2.3.1.8						
Use Case ref.:	UC_23								
Pre-test conditions:	UE_	of IMS_A is configured ac A has IP bearers establishe A is registered in IMS_A us CF within the trust domain o	ed to its IMS networks as per clause 4.2.1 sing any user identity						
			_						
Test Sequence:	Step								
	1	User A calls User B							
	2		med of incoming call of User A						
	3	Verify that user A is infor	med that UE_B is ringing						
	4	User B answers call							
	5	Verify that user A is infor	med that call has been answered						
	6	Verify that user A and B	can communicate						
	7	User B ends call							
	8	Verify that user B is infor	med that call has ended						
	9	Verify that user A is infor	med that call has ended						
		J · · · · · · · · · · · · · · · · · · ·	The that can had orided						

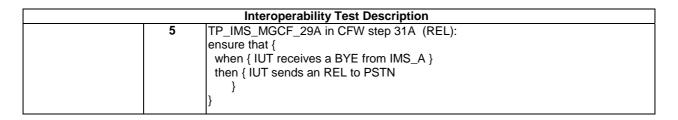
		Interoperability Test Description
Conformance	Check	
Criteria:	1	TP_IMS_MGCF_02 in CFW step 7 (100 Trying):
		ensure that {
		when { IUT receives an initial INVITE from IAM_A}
		then { IUT sends a 100_response to IMS_A
		}
	_	}
	2	TP_IMS_MGCF_03 in CFW step 7 and 8 (183 Session Progress):
		ensure that {
		when { IUT receives an initial INVITE from IMS_A }
		then { IUT sends a 100_response to IMS_A and
		sends 183_response to IMS_A
		containing Require_header indicating 100rel_value and
		containing a P-Charging-Vector_header
		including a term-ioi_parameter
		indicating the operator_identifier of IMS_A
		}
	3	TP_IMS_MGCF_06 in CFW step 17 (180 Ringing):
	"	lensure that {
		when { IUT receives an ACM indicating subscriber_free
		or receives a CPG indicating ALERTING from PSTN }
		then { IUT sends a 180_response to IMS_A
		}
		}
	4	TP_IMS_MGCF_07 in CFW step 22 (200 OK):
		ensure that {
		when { IUT receives an ANM from PSTN}
		then { IUT sends a 200_response to IMS_A
		}
		 }
	5	TP_IMS_MGCF_08 in CFW step 32B (BYE):
		ensure that {
		when { IUT receives an REL from PSTN}
		then { IUT sends a BYE to IMS_A
		}
		}

Step				Direction	on			Message	Comment
	U s e r A	U E A	M S A	E N U M DB	M G C F	P S T N	U s e r B		
1		\rightarrow							User A calls User B
2			\rightarrow					INVITE	UE_A sends INVITE with the first SDP offer indicating all desired medias and codecs that
3		←	_					100 Trying	IMS_A responds with a 100 Trying provisional response
4				\rightarrow				ENUM	IMS_A sends query to ENUM DB
5			\leftarrow	_				ENUM	ENUM DB sends response to IMS_A
6			_	- -	\rightarrow			INVITE	IMS_A forwards INVITE to MGCF
7			\leftarrow					100 Trying	MGCF responds with a 100 Trying provisional response
8			\leftarrow	- -				183 Session Progress	MGCF responds with 183 Session Progress response
9		←	\perp					183 Session Progress	IMS_forwards 183 Session Progress response to UE_A
10			\rightarrow					PRACK	UE_A sends PRACK to IMS_A

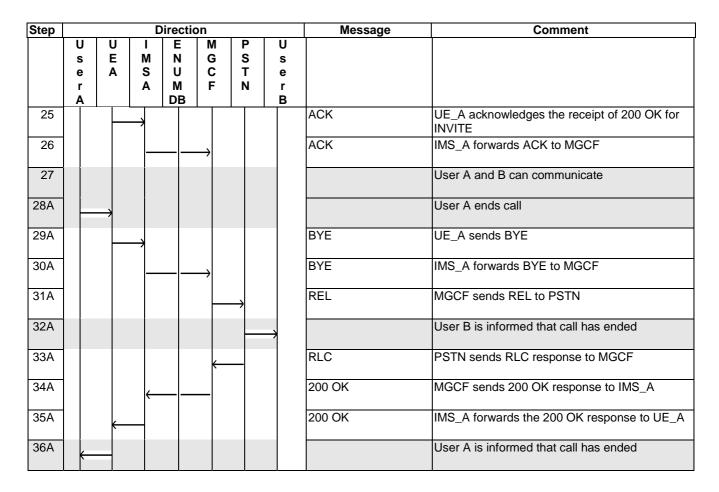
Step				Direct	ion			Message	Comment
	U s	U	I M	E N	M G	P S	U s		
	е	A	S	U	C	T	е		
	r A		Α	DB		IN .	r B		
11				_	\longrightarrow			PRACK	IMS_A forwards PRACK to MGCF
12			\leftarrow					200 OK (PRACK)	MGCF responds with 200 OK response to IMS_A
13		←	_					200 OK (PRACK)	IMS_A forwards 200 OK response to UE_A
14						\rightarrow		IAM	MGCF sends IAM to PSTN
15							\rightarrow		User B is informed of incoming call of User A
16					←			ACM/CPG	PSTN responds with ACM/CPG
17			\leftarrow					180 Ringing	MGCF sends 180 Ringing response to IMS_A
18		←	_					180 Ringing	IMS_A forwards the 180 Ringing response to UE_A
19	+								User A is informed that UE_B is ringing
20						—			User B answers call
21					←			ANM	PSTN sends ANM to MGCF
22			\leftarrow					200 OK	MGCF sends 200 OK response to IMS_A
23		←						200 OK	IMS_A forwards 200 OK response to UE_A
24	+								User A is informed that call has been answered
25			\rightarrow					ACK	UE_A acknowledges the receipt of 200 OK for INVITE
26					\longrightarrow			ACK	IMS_A forwards ACK to MGCF
27									User A and B can communicate
28B						(User B ends call
29B					←			REL	PSTN sends BYE to MGCF
30B						\rightarrow		RLC	MGCF responds RLC to PSTN
31B							\rightarrow		User B is informed that call has ended
32B			\leftarrow	_ _				BYE	MGCF sends BYE to IMS_A
33B			\dashv					BYE	IMS_A forwards BYE to UE_A
34B	+								User A is informed that call has ended
35B			\rightarrow					200 OK	UE_A sends 200 OK for BYE
36B					\longrightarrow			200 OK	IMS_A forwards 200 OK response to MGCF

4.5.8.1.3 Normal Call, IMS user clears call

		Interoperability Test Desc	crintion						
Identifier:	TD_IMS_PSTN		onpuon .						
Summary:		PSTN, IMS user clears call							
Configuration:	CF_PSTN	1 CTT, INIC GOT SICATO CAIT							
SUT:	IMS A and MG	CF							
References:	Test Purpose		Specification Reference						
	TP_IMS_MGCF	02	TS 124 229 [1], clause 5.5.3.1.2						
	TP_IMS_MGCF		TS 124 229 [1], clause 5.5.3.1.2						
	TP_IMS_MGCF		TS 124 229 [1], clause 5.5.3.2.2						
			TS 129 163 [18], clause 7.2.3.1.4						
	TP_IMS_MGCF	_07	TS 124 229 [1], clause 5.4.1.2.2						
			TS 129 163 [18], clause 7.2.3.1.5						
	TP_IMS_MGCF	_17	TS 129 163 [18], clause 7.2.3.2.13						
Use Case ref.:	UC_23								
Pre-test		MS_A is configured according							
conditions:			IMS networks as per clause 4.2.1						
		registered in IMS_A using any							
	MGCF v	thin the trust domain of IMS_	A						
- 10	2								
Test Sequence:	Step	A II II D							
		A calls User B							
	2 Verify that user B is informed of incoming call of User A								
	3 Verify that user A is informed that UE_B is ringing								
	4 User B answers call 5 Verify that user A is informed that call has been answered								
	6 Verify that user A and B can communicate								
		· A ends call	nuncate						
	8 Verify that user B is informed that call has ended								
		y that user A is informed that							
	0 10.	y wat door it to mile made	our rido oridou						
Conformance	Check								
Conformance Criteria:	1 TP_	MS_MGCF_02 in CFW step	7 (100 Trying):						
	1 TP_ ens	ıre that {							
	1 TP_ ens wh	ire that { en {	VITE from IAM_A}						
	1 TP_ ens wh	en { IUT receives an initial IN' n { IUT sends a 100_respons	VITE from IAM_A}						
	1 TP_ ens wh	ire that { en {	VITE from IAM_A}						
	1 TP_ ens wt the	re that { en { IUT receives an initial IN' n { IUT sends a 100_respons }	VITE from IAM_A} e to IMS_A						
	1 TP_ ens wh the } 2 TP_	re that { en { IUT receives an initial IN\ n { IUT sends a 100_respons } MS_MGCF_03 in CFW step	VITE from IAM_A}						
	1 TP_ ens wh the } 2 TP_ ens	re that { en { IUT receives an initial IN' n { IUT sends a 100_respons } MS_MGCF_03 in CFW step ire that {	VITE from IAM_A} e to IMS_A 7 and 8 (183 Session Progress):						
	1 TP_ ens wh the } 2 TP_ ens wh	ire that { en { IUT receives an initial IN' n { IUT sends a 100_respons } MS_MGCF_03 in CFW step ire that { en { IUT receives an initial IN'	VITE from IAM_A} e to IMS_A 7 and 8 (183 Session Progress): VITE from IMS_A }						
	1 TP_ ens wh the } 2 TP_ ens wh	re that { en { IUT receives an initial IN' n { IUT sends a 100_respons } MS_MGCF_03 in CFW step re that { en { IUT receives an initial IN' n { IUT sends a 100_respons	VITE from IAM_A} e to IMS_A 7 and 8 (183 Session Progress): VITE from IMS_A } e to IMS_A and						
	1 TP_ ens wh the } 2 TP_ ens wh	re that { en { IUT receives an initial IN' n { IUT sends a 100_respons } MS_MGCF_03 in CFW step re that { en { IUT receives an initial IN' n { IUT sends a 100_respons sends 183_respons	VITE from IAM_A} e to IMS_A 7 and 8 (183 Session Progress): VITE from IMS_A } e to IMS_A and						
	1 TP_ ens wh the } 2 TP_ ens wh	re that { en { IUT receives an initial IN' n { IUT sends a 100_respons } MS_MGCF_03 in CFW step re that { en { IUT receives an initial IN' n { IUT sends a 100_respons sends 183_respons	VITE from IAM_A} e to IMS_A 7 and 8 (183 Session Progress): VITE from IMS_A } e to IMS_A and the to IMS_A uire_header indicating 100rel_value and						
	1 TP_ ens wh the } 2 TP_ ens wh	re that { en { IUT receives an initial IN' n { IUT sends a 100_respons } MS_MGCF_03 in CFW step ire that { en { IUT receives an initial IN' n { IUT sends a 100_respons	VITE from IAM_A} e to IMS_A 7 and 8 (183 Session Progress): VITE from IMS_A } e to IMS_A and the to IMS_A uire_header indicating 100rel_value and ting-Vector_header ting a term-ioi_parameter						
	1 TP_ ens wh the } 2 TP_ ens wh	re that { en { IUT receives an initial IN' n { IUT sends a 100_respons } MS_MGCF_03 in CFW step ire that { en { IUT receives an initial IN' n { IUT sends a 100_respons	VITE from IAM_A} e to IMS_A 7 and 8 (183 Session Progress): VITE from IMS_A } e to IMS_A and be to IMS_A iire_header indicating 100rel_value and ing-Vector_header						
	1 TP_ ens wh the } 2 TP_ ens wh	re that { en { IUT receives an initial IN' n { IUT sends a 100_respons } MS_MGCF_03 in CFW step ire that { en { IUT receives an initial IN' n { IUT sends a 100_respons	VITE from IAM_A} e to IMS_A 7 and 8 (183 Session Progress): VITE from IMS_A } e to IMS_A and the to IMS_A uire_header indicating 100rel_value and ting-Vector_header ting a term-ioi_parameter						
	1 TP_ens wh the 2 TP_ens wh the	re that { en { IUT receives an initial IN' n { IUT sends a 100_respons } MS_MGCF_03 in CFW step ire that { en { IUT receives an initial IN' n { IUT sends a 100_respons	VITE from IAM_A} e to IMS_A 7 and 8 (183 Session Progress): VITE from IMS_A } e to IMS_A and the to IMS_A uire_header indicating 100rel_value and ting-Vector_header ting a term-ioi_parameter ting the operator_identifier of IMS_A						
	1 TP_ens what the state of the	Ire that { en { IUT receives an initial INI en { IUT sends a 100_respons } MS_MGCF_03 in CFW step ire that { en { IUT receives an initial INI en { IUT sends a 100_respons sends 183_respons containing Requ containing a P-Chargi includin indicatii } MS_MGCF_06 in CFW step	VITE from IAM_A} e to IMS_A 7 and 8 (183 Session Progress): VITE from IMS_A } e to IMS_A and the to IMS_A uire_header indicating 100rel_value and ting-Vector_header ting a term-ioi_parameter ting the operator_identifier of IMS_A						
	1 TP_ens wh the 2 TP_ens wh the 3 TP_ens	Ire that { en { IUT receives an initial IN' n { IUT sends a 100_respons } MS_MGCF_03 in CFW step ire that { en { IUT receives an initial IN' n { IUT sends a 100_respons	VITE from IAM_A} e to IMS_A 7 and 8 (183 Session Progress): VITE from IMS_A } e to IMS_A and e to IMS_A uire_header indicating 100rel_value and ing-Vector_header ig a term-ioi_parameter ing the operator_identifier of IMS_A						
	1 TP_ens wh the 2 TP_ens wh the 3 TP_ens	Ire that { en { IUT receives an initial IN' n { IUT sends a 100_respons } MS_MGCF_03 in CFW step ire that { en { IUT receives an initial IN' n { IUT sends a 100_respons	VITE from IAM_A} e to IMS_A 7 and 8 (183 Session Progress): VITE from IMS_A } e to IMS_A and e to IMS_A uire_header indicating 100rel_value and ing-Vector_header ig a term-ioi_parameter ing the operator_identifier of IMS_A 17 (180 Ringing): licating subscriber_free						
	1 TP_ens what the series when the series where the series where the series when the series whe	Ire that { en { IUT receives an initial IN' n { IUT sends a 100_respons } MS_MGCF_03 in CFW step ire that { en { IUT receives an initial IN' n { IUT sends a 100_respons	VITE from IAM_A} e to IMS_A 7 and 8 (183 Session Progress): VITE from IMS_A } e to IMS_A and e to IMS_A uire_header indicating 100rel_value and ing-Vector_header ing a term-ioi_parameter ing the operator_identifier of IMS_A 17 (180 Ringing): licating subscriber_free indicating ALERTING from PSTN }						
	1 TP_ens what the series when the series where the series where the series when the series whe	Ire that { en { IUT receives an initial IN' n { IUT sends a 100_respons } MS_MGCF_03 in CFW step ire that { en { IUT receives an initial IN' n { IUT sends a 100_respons	VITE from IAM_A} e to IMS_A 7 and 8 (183 Session Progress): VITE from IMS_A } e to IMS_A and e to IMS_A uire_header indicating 100rel_value and ing-Vector_header ing a term-ioi_parameter ing the operator_identifier of IMS_A 17 (180 Ringing): licating subscriber_free indicating ALERTING from PSTN }						
	1 TP_ens what the series when the series where the series where the series when the series whe	Ire that { en { IUT receives an initial IN' n { IUT sends a 100_respons } MS_MGCF_03 in CFW step ire that { en { IUT receives an initial IN' n { IUT sends a 100_respons	VITE from IAM_A} e to IMS_A 7 and 8 (183 Session Progress): VITE from IMS_A } e to IMS_A and e to IMS_A uire_header indicating 100rel_value and ing-Vector_header ing a term-ioi_parameter ing the operator_identifier of IMS_A 17 (180 Ringing): licating subscriber_free indicating ALERTING from PSTN }						
	1 TP_ens whether the state of t	Ire that { en { IUT receives an initial IN' n { IUT sends a 100_respons } MS_MGCF_03 in CFW step ire that { en { IUT receives an initial IN' n { IUT sends a 100_respons	VITE from IAM_A} e to IMS_A 7 and 8 (183 Session Progress): VITE from IMS_A } e to IMS_A and e to IMS_A uire_header indicating 100rel_value and ing-Vector_header g a term-ioi_parameter ng the operator_identifier of IMS_A 17 (180 Ringing): licating subscriber_free indicating ALERTING from PSTN } e to IMS_A						
	1 TP_ens wh the } 2 TP_ens wh the } 3 TP_ens wh the } 4 TP_ens	Ire that { en { IUT receives an initial IN! n { IUT sends a 100_respons } } MS_MGCF_03 in CFW step ire that { en { IUT receives an initial IN! n { IUT sends a 100_respons	VITE from IAM_A} e to IMS_A 7 and 8 (183 Session Progress): VITE from IMS_A } e to IMS_A and e to IMS_A uire_header indicating 100rel_value and ing-Vector_header ing a term-ioi_parameter ing the operator_identifier of IMS_A 17 (180 Ringing): Ilicating subscriber_free indicating ALERTING from PSTN } e to IMS_A						
	1 TP_ens wh the } 2 TP_ens wh the } 3 TP_ens wh the } 4 TP_ens wh	Ire that { en { IUT receives an initial IN! n { IUT sends a 100_respons } } MS_MGCF_03 in CFW step ire that { en { IUT receives an initial IN! n { IUT sends a 100_respons	VITE from IAM_A} e to IMS_A 7 and 8 (183 Session Progress): VITE from IMS_A } e to IMS_A and e to IMS_A uire_header indicating 100rel_value and ing-Vector_header ing a term-ioi_parameter ing the operator_identifier of IMS_A 17 (180 Ringing): Ilicating subscriber_free indicating ALERTING from PSTN } e to IMS_A 22 (200 OK): m PSTN}						
	1 TP_ens wh the } 2 TP_ens wh the } 3 TP_ens wh the } 4 TP_ens wh	Ire that { en { IUT receives an initial IN! n { IUT sends a 100_respons } } MS_MGCF_03 in CFW step ire that { en { IUT receives an initial IN! n { IUT sends a 100_respons	VITE from IAM_A} e to IMS_A 7 and 8 (183 Session Progress): VITE from IMS_A } e to IMS_A and e to IMS_A uire_header indicating 100rel_value and ing-Vector_header ing a term-ioi_parameter ing the operator_identifier of IMS_A 17 (180 Ringing): Ilicating subscriber_free indicating ALERTING from PSTN } e to IMS_A 22 (200 OK): m PSTN}						
	1 TP_ens wh the } 2 TP_ens wh the } 3 TP_ens wh the } 4 TP_ens wh	Ire that { en { IUT receives an initial IN! n { IUT sends a 100_respons } } MS_MGCF_03 in CFW step ire that { en { IUT receives an initial IN! n { IUT sends a 100_respons	VITE from IAM_A} e to IMS_A 7 and 8 (183 Session Progress): VITE from IMS_A } e to IMS_A and e to IMS_A uire_header indicating 100rel_value and ing-Vector_header ing a term-ioi_parameter ing the operator_identifier of IMS_A 17 (180 Ringing): Ilicating subscriber_free indicating ALERTING from PSTN } e to IMS_A 22 (200 OK): m PSTN}						
	1 TP_ens wh the } 2 TP_ens wh the } 3 TP_ens wh the } 4 TP_ens wh	Ire that { en { IUT receives an initial IN! n { IUT sends a 100_respons } } MS_MGCF_03 in CFW step ire that { en { IUT receives an initial IN! n { IUT sends a 100_respons	VITE from IAM_A} e to IMS_A 7 and 8 (183 Session Progress): VITE from IMS_A } e to IMS_A and e to IMS_A uire_header indicating 100rel_value and ing-Vector_header ing a term-ioi_parameter ing the operator_identifier of IMS_A 17 (180 Ringing): Ilicating subscriber_free indicating ALERTING from PSTN } e to IMS_A 22 (200 OK): m PSTN}						

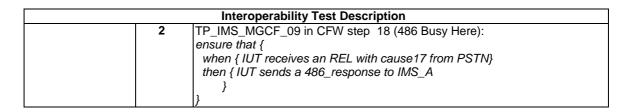


Step			Г	Direction	on			Message	Comment
	U	U	I	Е	M	Р	U		
	S	E	M	N	G	S	S		
	e r	Α	S A	U M	C	T N	e r		
	A		^	DB	•		В		
1		\rightarrow							User A calls User B
2								INVITE	UE_A sends INVITE with the first SDP offer
_			\rightarrow						indicating all desired medias and codecs that
3		\leftarrow	_					100 Trying	IMS_A responds with a 100 Trying provisional response
4				\rightarrow				ENUM	IMS_A sends query to ENUM DB
5			\leftarrow	_				ENUM	ENUM DB sends response to IMS_A
6			_		\rightarrow			INVITE	IMS_A forwards INVITE to MGCF
7			\leftarrow		_			100 Trying	MGCF responds with a 100 Trying provisional response
8			\leftarrow		_			183 Session Progress	MGCF responds with 183 Session Progress response
9		_						183 Session	IMS_forwards 183 Session Progress response
10		Ì						Progress	to UE_A
10		-	\rightarrow					PRACK	UE_A sends PRACK to IMS_A
11			_		\rightarrow			PRACK	IMS_A forwards PRACK to MGCF
12			\leftarrow					200 OK (PRACK)	MGCF responds with 200 OK response to IMS_A
13		\leftarrow	_					200 OK (PRACK)	IMS_A forwards 200 OK response to UE_A
14						\rightarrow		IAM	MGCF sends IAM to PSTN
15							\rightarrow		User B is informed of incoming call of User A
16					←			ACM/CPG	PSTN responds with ACM/CPG
17			\leftarrow		_			180 Ringing	MGCF sends 180 Ringing response to IMS_A
18		←						180 Ringing	IMS_A forwards the 180 Ringing response to UE_A
19	—								User A is informed that UE_B is ringing
20						—			User B answers call
21					—			ANM	PSTN sends ANM to MGCF
22			\leftarrow		_			200 OK	MGCF sends 200 OK response to IMS_A
23		—						200 OK	IMS_A forwards 200 OK response to UE_A
24	←								User A is informed that call has been answered



4.5.8.1.4 Unsuccessful Call, PSTN user busy

	Interoperability Test Description									
Identifier:	TD_IMS_F	PSTN_0003								
Summary:	Outgoing of	call to PSTN, user B busy								
Configuration:	CF_PSTN									
SUT:	IMS_A and MGCF									
References:	Test Purp	ose	Specification Reference							
	TP_IMS_N	MGCF_02	TS 124 229 [1], clause 5.5.3.1.2							
	TP_IMS_N	MGCF_09	TS 129 163 [18], clause 7.2.3.1.8							
Use Case ref.:	UC_23									
Pre-test conditions:	 HSS of IMS_A is configured according to table 1 UE_A has IP bearers established to its IMS networks as per clause 4.2.1 UE_A is registered in IMS_A using any user identity MGCF within the trust domain of IMS_A User B in the PSTN is busy 									
Test Sequence:	Step									
rest ocquerioe.	1	User A calls User B								
	2	Verify that user A is informed that	User B is busy							
		i can a con i no miorino di di	200. 2.0 2009							
Conformance Criteria:	Check									
	1	TP_IMS_MGCF_02 in CFW step ensure that { when { IUT receives an initial IN' then { IUT sends a 100_respons }	VITE from IAM_A}							

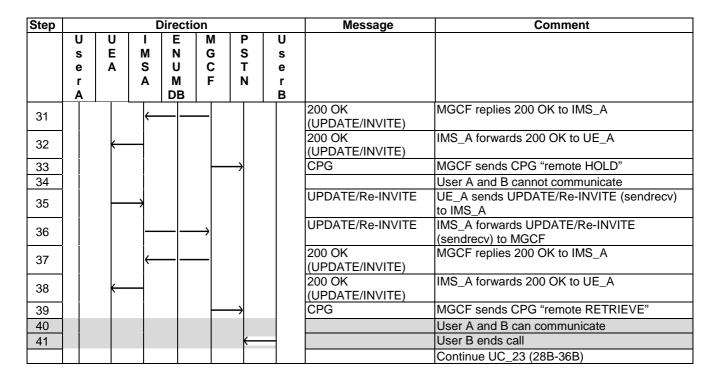


Step	Direction							Message	Comment
	U s e r A	U E A	M S A	E N U M DB	M G C F	P S T N	U s e r B		
1									User B is busy
2		\rightarrow							User A calls User B
3			\rightarrow					INVITE	UE_A sends INVITE with the first SDP offer indicating all desired medias and codecs that UE_A supports
4		←						100 Trying	IMS_A responds with a 100 Trying provisional response
5			_	\rightarrow				ENUM	IMS_A sends query to ENUM DB
6			\leftarrow					ENUM	ENUM DB sends response to IMS_A
7			_	_	\longrightarrow			INVITE	IMS_A forwards INVITE to MGCF
8			←		_			100 Trying	MGCF responds with a 100 Trying provisional response
9			\leftarrow		_			183 Session Progress	MGCF responds with 183 Session Progress response
10		←						183 Session Progress	IMS_forwards 183 Session Progress response to UE_A
11			\rightarrow					PRACK	UE_A sends PRACK to IMS_A
12			_	_	\longrightarrow			PRACK	IMS_A forwards PRACK to MGCF
13			←		_			200 OK (PRACK)	MGCF responds with 200 OK response to IMS_A
14		\leftarrow						200 OK (PRACK)	IMS_A forwards 200 OK response to UE_A
15						\rightarrow		IAM	MGCF sends IAM to PSTN
16					\leftarrow			REL (cause #17)	PSTN responds with REL "user busy"
17						\rightarrow		RLC	MGCF sends RLC to PSTN
18			\leftarrow					486 Busy Here	MGCF sends 486 Busy Here response to IMS_A
19		←						486 Busy Here	IMS_A forwards 486 Busy Here response to UE_A
20	←								User A is informed that User B is busy
21			\rightarrow					ACK	UE_A acknowledges the receipt of 486 for INVITE
22			_	_	\longrightarrow			ACK	IMS_A forwards ACK to MGCF

4.5.8.1.5 IMS user holds/resumes call

		Interoperability Tes	t Description				
Identifier:	TD_IMS_PSTN_0004						
Summary:	Outgoing call to PSTN, communication hold by IMS user						
Configuration:	CF_PSTN						
SUT:	IMS_A ar	nd MGCF					
References:	Test Pur		Specification Reference				
		MGCF_11	TS 129 163 [18], clause 7.4.10.1				
		MGCF_12	TS 129 163 [18], clause 7.4.10.1				
Use Case ref.:	UC_23						
Pre-test conditions:	 HSS of IMS_A is configured according to table 1 UE_A has IP bearers established to its IMS networks as per clause 4.2.1 UE_A is registered in IMS_A using any user identity MGCF within the trust domain of IMS_A UE_A configured to perform user initiated hold/resume using INVITE 						
	1 -						
Test Sequence:	Step						
	1	User A calls User B					
	2	ned of incoming call of User A					
	3	Verify that user A is inforn	ned that UE_B is ringing				
	4 User B answers call						
	5 Verify that user A is informed that call has been answered						
	6 Verify that user A and B can communicate						
	7 User A puts connection to B on hold						
	8 Verify that user A and B cannot communicate						
	9	User A resumes connection to B					
	10	Verify that user A and B can communicate					
	11 User B ends call						
	12 Verify that user B is informed that call has ended 13 Verify that user A is informed that call has ended						
	13	verily that user A is illion	led that call has ended				
Conformance	Check						
Criteria:	1	TP_IMS_MGCF_11 in CF	W step 33 (CPG):				
		ensure that {	stop 30 (c. 3).				
		when { IUT receives an UPDATE or a target_refresh INVITE					
			ing a SDP				
			cating sendonly from IMS_A }				
		then { IUT sends a CPG	indicating remote_hold to PSTN				
		}					
		}					
	2	TP_IMS_MGCF_12 in CFW step 39 (CPG):					
		ensure that {	IPDATE or a target refresh INIVITE				
			JPDATE or a target_refresh INVITE ing a SDP				
			cating sendrecv from IMS_A }				
			indicating remote_retrieve to PSTN				
		}					
		} '					
	1	I/					

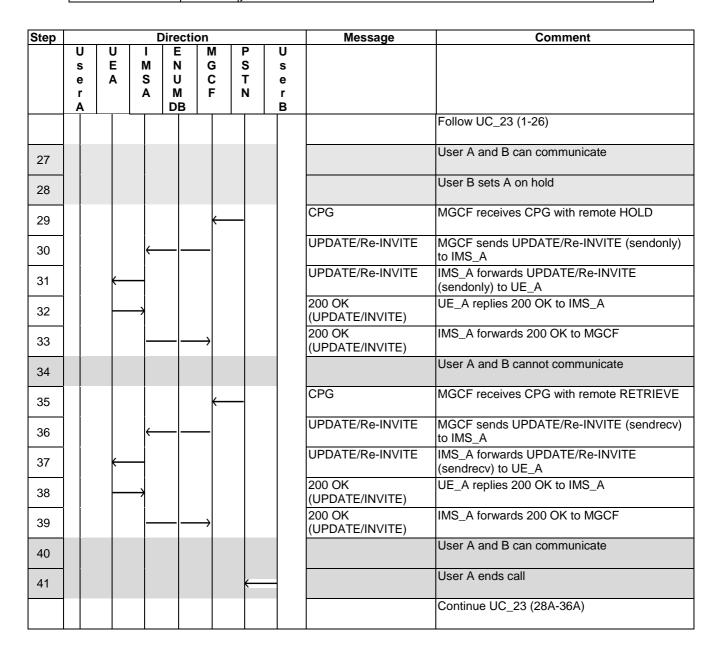
Step		Direction							Message	Comment
	U	U		Е		M	Р	U		
	s	Е	M	N		G	S	s		
	е	Α	S	U		С	Т	е		
	r		Α	M		F	N	r		
	A			DB	3			В		
										Follow UC_23 (1-26)
27										User A and B can communicate
28										User A sets B on hold
29			\rightarrow						UPDATE/Re-INVITE	UE_A sends UPDATE/Re-INVITE (sendonly) to IMS_A
30						>			UPDATE/Re-INVITE	IMS_A forwards UPDATE/Re-INVITE (sendonly) to MGCF



4.5.8.1.6 PSTN user holds/resumes call

		Interoperability Test D	escription				
Identifier:	TD_IMS_PSTN_0005						
Summary:	Outgoing call to PSTN, communication hold by PSTN user						
Configuration:	CF_PSTN						
SUT:	IMS_A and MGCF						
References:	Test Purp	oose	Specification Reference				
		MGCF_13	TS 129 163 [18], clause 7.4.10.2				
	TP_IMS_I	MGCF_14	TS 129 163 [18], clause 7.4.10.2				
Use Case ref.:	UC_23						
Pre-test	 HSS 	of IMS_A is configured accord	ling to table 1				
conditions:	UE_A	has IP bearers established to	its IMS networks as per clause 4.2.1				
	UE_A	A is registered in IMS_A using	any user identity				
	 MGC 	F within the trust domain of IM	IS_A				
Test Sequence:	Step						
	1	User A calls User B					
	2	Verify that user B is informed					
	1 2 3	Verify that user B is informed Verify that user A is informed					
	3 4	Verify that user B is informed Verify that user A is informed User B answers call	that UE_B is ringing				
	3 4 5	Verify that user B is informed Verify that user A is informed User B answers call Verify that user A is informed	that UE_B is ringing that call has been answered				
	3 4 5 6	Verify that user B is informed Verify that user A is informed User B answers call Verify that user A is informed Verify that user A and B can	that UE_B is ringing that call has been answered communicate				
	3 4 5	Verify that user B is informed Verify that user A is informed User B answers call Verify that user A is informed	that UE_B is ringing that call has been answered communicate				
	3 4 5 6 7 8	Verify that user B is informed Verify that user A is informed User B answers call Verify that user A is informed Verify that user A and B can	that UE_B is ringing that call has been answered communicate on hold				
	3 4 5 6 7	Verify that user B is informed Verify that user A is informed User B answers call Verify that user A is informed Verify that user A and B can User B puts connection to A	that UE_B is ringing that call has been answered communicate on hold not communicate				
	3 4 5 6 7 8	Verify that user B is informed User B answers call Verify that user A is informed User B answers call Verify that user A is informed Verify that user A and B can User B puts connection to A Verify that user A and B can	that UE_B is ringing that call has been answered communicate on hold not communicate o A				
	3 4 5 6 7 8	Verify that user B is informed User B answers call Verify that user A is informed User B answers call Verify that user A is informed Verify that user A and B can User B puts connection to A Verify that user A and B can User B resumes connection to Verify that user A and B can User B ends call	that UE_B is ringing that call has been answered communicate on hold not communicate o A communicate				
	3 4 5 6 7 8 9 10 11	Verify that user B is informed User B answers call Verify that user A is informed User B answers call Verify that user A is informed Verify that user A and B can User B puts connection to A Verify that user A and B can User B resumes connection to Verify that user A and B can User B ends call Verify that user B is informed	that UE_B is ringing that call has been answered communicate on hold not communicate o A communicate that call has ended				
	3 4 5 6 7 8 9 10	Verify that user B is informed User B answers call Verify that user A is informed User B answers call Verify that user A is informed Verify that user A and B can User B puts connection to A Verify that user A and B can User B resumes connection to Verify that user A and B can User B ends call	that UE_B is ringing that call has been answered communicate on hold not communicate o A communicate that call has ended				

	Interoperability Test Description							
Conformance	Check							
Criteria:	1	TP_IMS_MGCF_13 in CFW step 30 (UPDATE): ensure that { when { IUT receives a CPG indicating remote_hold from PSTN } then { IUT sends an UPDATE or a target_refresh INVITE						
	2	TP_IMS_MGCF_14 in CFW step 39 (UPDATE):: ensure that { when { IUT receives a CPG indicating remote_retrieve from PSTN } then { IUT sends an UPDATE or a target_refresh INVITE containing a SDP indicating sendonly to IMS_A } }						



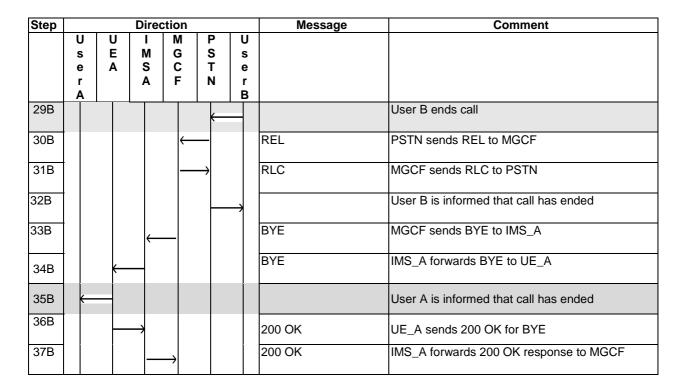
4.5.8.2 PSTN-to-IMS call

4.5.8.2.1 Normal Call, PSTN user clears call

		Interoperability Tes	t Description					
Identifier:		PSTN_0006						
Summary:	Incoming call from PSTN, PSTN user clears call							
Configuration:	CF_PSTN IMS_A and MGCF							
SUT:	IMS_A ar	nd MGCF						
References:	Test Pur	oose	Specification Reference					
		MGCF_01	TS 124 229 [1], clause 5.5.3.1.1					
	TP_IMS_	MGCF_05	TS 124 229 [1], clause 5.5.3.2,1					
		MGCF_15	TS 129 163 [18], clauses 7.2.3.2.4 and					
		_	7.2.3.2.6					
	TP_IMS	MGCF_16	TS 129 163 [18], clause 7.2.3.2.8					
	TP_IMS	MGCF_08	TS 124 229 [1], clause 5.5.4.1					
		_	TS 129 163 [18], clause 7.2.3.1.8					
Use Case ref.:	UC_24		1 1					
Pre-test	 HSS 	of IMS_A is configured acc	ording to table 1					
conditions:			d to its IMS networks as per clause 4.2.1					
		A is registered in IMS_A usi						
		F within the trust domain of						
	₩GC	within the trust domain of	IIVIO_A					
Test Sequence:	Step							
rest Sequence.		Hear P colle Hear A						
	1	User B calls User A	and of incoming call of Llaar D					
	2		ned of incoming call of User B					
	3	Verify that user B is inform	led that UE_A is ringing					
	4	User A answers the call	. ,					
	5	Verify that user A and B ca	an communicate					
	6	User B ends call						
	7	Verify that user B is inform						
	8	Verify that user A is inform	ned that call has ended					
0 (
Conformance	Check	TD 1110 1100E 04: 05	MA (
Criteria:	1	TP_IMS_MGCF_01 in CF	W step 3 (INVITE):					
		ensure that {	" LIAMA (BOTAL)					
		when { IUT receives an initial IAM from PSTN }						
		then { IUT sends a INVITE to IMS_A						
		containing a Request_URI						
		indicating Tel_URI_E.164_Number or (Sip_URI_E.164_Number with user_portion_phone)						
		containing a Contact						
		containing a Support	e_GRUU_format and					
		including an 100re						
			ted-Identity_header and					
		containing a P-Asser						
			value_parameter and					
		containing a SDP	alao_parameter and					
			supported and curr_precondition					
		}	apported and eart_precentation					
		13						
I	<u> </u>	l						

		Interoperability Test Description						
	2	TP_IMS_MGCF_05 in CFW step 14 (UPDATE):						
		ensure that {						
		when { IUT receives an 2000K_PRACK from IMS_A and						
		conditions_fullfilled}						
		then { IUT sends a UPDATE to IMS_A						
		}						
	3	TP_IMS_MGCF_15 in CFW step 20 (ACM/CPG):						
	3							
		ensure that {						
		when { IUT receives a 180_response from IMS_A }						
		then { IUT sends an ACM indicating subscriber_free						
		or sends a CPG indicating ALERTING to PSTN						
		}						
		}						
	4	TP_IMS_MGCF_16 in CFW step 25 (ANM):						
		ensure that {						
		when { IUT receives a 200_response from IMS_A }						
		then { IUT sends an ANM to PSTN						
		}						
	5	TP_IMS_MGCF_08 in CFW step 33B (BYE):						
	·	lensure that {						
		when { IUT receives an REL from PSTN}						
		· · · · · · · · · · · · · · · · · · ·						
		then { IUT sends a BYE to IMS_A						
		<u> </u>						
		<u></u>						

Step	•		Direc	ction			Message	Comment
	U s	U E	I M	M	P S	U		
	e	Α	S A	C	T N	е		
	r A		Α	F	IN .	r B		
1					\leftarrow	+		User B calls User A
2				\leftarrow			IAM	PSTN send IAM to MGCF
3			←	_			INVITE	MGCF sends INVITE to IMS_A (SDP with precondition status, MIME subtype "telephone-event", clause 6.4.1)
4				\rightarrow			100 Trying	IMS_A responds with a 100 Trying provisional response
5		\leftarrow					INVITE	IMS_A forwards INVITE to UE_A
6			\rightarrow				100 Trying	UE_A optionally responds with a 100 Trying provisional response
7			\rightarrow				183 Session Progress	UE_A sends 183 Session Progress response to IMS_A
8				\rightarrow			183 Session Progress	IMS_A forwards 183 Session Progress response to MGCF
9			←	_			PRACK	MGCF responds with PRACK to IMS_A
10		—	\dashv				PRACK	IMS_A forwards PRACK to UE_A
11			\rightarrow				200 OK (PRACK)	UE_A responds with 200 OK to IMS_A
12				\rightarrow			200 OK (PRACK)	IMS_A forwards 200 OK to MGCF
13			\leftarrow	_			UPDATE	MGCF sends UPDATE to IMS_A
14		\leftarrow					UPDATE	IMS_A forwards UPDATE to UE_A
15			\rightarrow				200 OK (UPDATE)	UE_A responds with 200 OK to IMS_A
16				\rightarrow			200 OK (UPDATE)	IMS_A forwards 200 OK to MGCF
17	←							User A is informed of incoming call of User B
18			\rightarrow				180 Ringing	UE_A responds to initial INVITE with 180
19				\rightarrow			180 Ringing	Ringing to indicate that it has started alerting IMS_A forwards 180 Ringing response to MGCF
20					\rightarrow		ACM/CPG	MGCF send ACM/CPG to PSTN
21						\rightarrow		User B is informed that UE_A is ringing
22		\rightarrow						User A answers the call
23			\rightarrow				200 OK	UE_A responds INVITE with 200 OK to indicate that the call has been answered
24			_	\rightarrow			200 OK	IMS_A forwards 200 OK response to MGCF
25					\rightarrow		ANM	MGCF sends ANM to PSTN
26			←				ACK	MGCF sends ACK to PSTN
27		←					ACK	IMS_A forwards ACK to UE_A
28	(User A and B can communicate

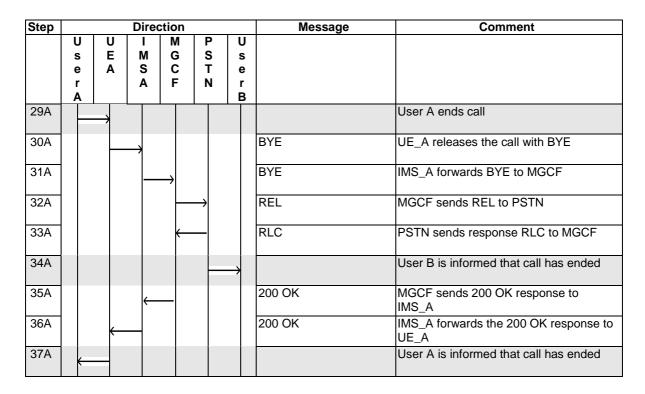


4.5.8.2.2 Normal Call, IMS user clears call

		Interoperability Test	Description				
Identifier:	TD_IMS_PSTN_0007						
Summary:		ncoming call from PSTN, IMS user clears call					
Configuration:	CF_PSTN						
SUT:	IMS_A an	d MGCF					
References:	Test Purp	oose	Specification Reference				
	TP_IMS_I	MGCF_01	TS 124 229 [1], clause 5.5.3.1.1				
	TP_IMS_I	MGCF_05	TS 124 229 [1], clause 5.5.3.2,1				
	TP_IMS_I	MGCF_15	TS 129 163 [18], clauses 7.2.3.2.4 and				
			7.2.3.2.6				
	TP_IMS_I	MGCF_16	TS 129 163 [18], clause 7.2.3.2.8				
	TP_IMS_I	MGCF_17	TS 129 163 [18], clause 7.2.3.2.13				
Use Case ref.:	UC_24						
Pre-test	HSS	of IMS_A is configured accord	ding to table 1				
conditions:	 UE_A 	A has IP bearers established	to its IMS networks as per clause 4.2.1				
		A is registered in IMS_A using					
	 MGC 	F within the trust domain of I	MS_A				
Test Sequence:	Step						
	1	User B calls User A					
	2	Verify that user A is informed of incoming call of User B					
	3	Verify that user B is informe	d that UE_A is ringing				
	4	User A answers the call					
	5	Verify that user A and B car	n communicate				
	6	User A ends call					
	7	Verify that user B is informed					
	8	Verify that user A is informed	d that call has ended				

		Interoperability Test Description
Conformance	Check	
Criteria:	1	TP_IMS_MGCF_01 in CFW step 3 (INVITE):
		ensure that {
		when { IUT receives an initial IAM from PSTN }
		then { IUT sends a INVITE to IMS_A
		containing a Request_URI
		indicating Tel_URI_E.164_Number
		or (Sip_URI_E.164_Number with user_portion_phone)
		containing a Contact_header
		indicating anyvalue_GRUU_format and
		containing a Supported_header
		including an 100rel value and
		containing a P-Asserted-Identity_header and
		containing a P-Charging-Vector_header
		indicating an icid-value_parameter and
		containing a SDP
		indicating codec_supported and curr_precondition
		}
	2	TP_IMS_MGCF_05 in CFW step 14 (UPDATE):
	_	ensure that {
		when { IUT receives an 2000K_PRACK from IMS_A and
		conditions_fullfilled}
		then { IUT sends a UPDATE to IMS_A
		then to rection a or DATE to livio_A
	3	TP_IMS_MGCF_15 in CFW step 20 (ACM/CPG):
		ensure that {
		when { IUT receives a 180_response from IMS_A }
		then { IUT sends an ACM indicating subscriber_free
		or sends a CPG indicating ALERTING to PSTN
		}
		}
	4	TP_IMS_MGCF_16 in CFW step 25 (ANM):
		ensure that {
		when { IUT receives a 200_response from IMS_A }
		then { IUT sends an ANM to PSTN
		}
		}
	5	TP_IMS_MGCF_32A in CFW step 24 (REL):
		ensure that {
		when { IUT receives a BYE from IMS_A }
		then { IUT sends an REL to PSTN
		then { for serius an NEE to PSTIV
		l)

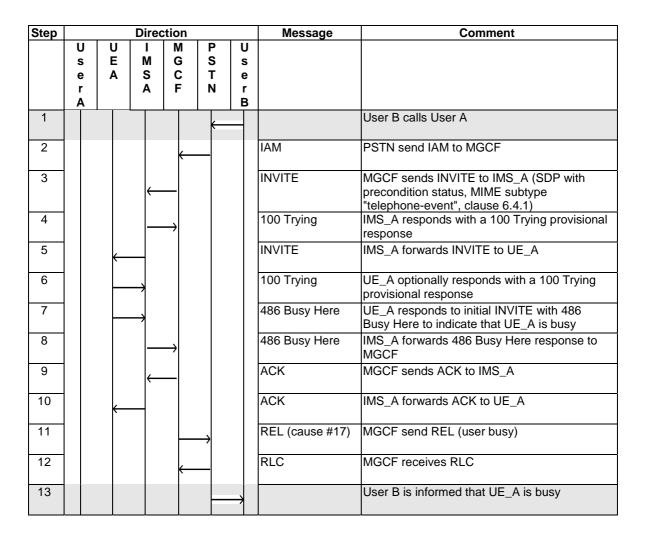
Step			Direc	ction			Message	Comment
	U s	U E	M	M G	PS	U		
	е	Ā	S	С	Т	е		
	r A		Α	F	N	r B		
1					\leftarrow			User B calls User A
2				(IAM	PSTN send IAM to MGCF
3			\leftarrow				INVITE	MGCF sends INVITE to IMS_A (SDP with precondition status, MIME subtype "telephone-event" clause 6.4.1)
4				\rightarrow			100 Trying	IMS_A responds with a 100 Trying provisional response
5		\leftarrow					INVITE	IMS_A forwards INVITE to UE_A
6			\rightarrow				100 Trying	UE_A optionally responds with a 100 Trying provisional response
7			\rightarrow				183 Session Progress	UE_A sends 183 Session Progress response to IMS_A
8			_	\rightarrow			183 Session Progress	IMS_A forwards 183 Session Progress response to MGCF
9			\leftarrow	_			PRACK	MGCF responds with PRACK to IMS_A
10		(PRACK	IMS_A forwards PRACK to UE_A
11			\rightarrow				200 OK (PRACK)	UE_A responds with 200 OK to IMS_A
12				\rightarrow			200 OK (PRACK)	IMS_A forwards 200 OK to MGCF
13			\leftarrow	_			UPDATE	MGCF sends UPDATE to IMS_A
14		←					UPDATE	IMS_A forwards UPDATE to UE_A
15			\rightarrow				200 OK (UPDATE)	UE_A responds with 200 OK to IMS_A
16			_	\rightarrow			200 OK (UPDATE)	IMS_A forwards 200 OK to MGCF
17	—							User A is informed of incoming call of User B
18			\rightarrow				180 Ringing	UE_A responds to initial INVITE with 180 Ringing to indicate that it has started
19			_	\rightarrow			180 Ringing	IMS_A forwards 180 Ringing response to MGCF
20				_	\longrightarrow		ACM/CPG	MGCF send ACM/CPG to PSTN
21						\rightarrow		User B is informed that UE_A is ringing
22		\rightarrow						User A answers the call
23			\rightarrow				200 OK	UE_A responds INVITE with 200 OK to indicate that the call has been answered
24			_	\rightarrow			200 OK	IMS_A forwards 200 OK response to MGCF
25				-	\longrightarrow		ANM	MGCF sends ANM to PSTN
26			←	_			ACK	MGCF sends ACK to PSTN
27		←	\blacksquare				ACK	IMS_A forwards ACK to UE_A
28	-							User A and B can communicate



4.5.8.2.3 Unsuccessful Call, IMS user busy

	Interoperability Test Description							
Identifier:	TD_IMS_PSTN_0008							
Summary:	Incoming of	call from PSTN, user A b	pusy					
Configuration:	CF_PSTN							
SUT:	IMS_A and	MGCF						
References:	Test Purp	ose	Specification Reference					
	TP_IMS_N	/IGCF_01	TS 124 229 [1], clause 5.5.3.1.1					
	TP_IMS_N	MGCF_10	TS 129 163 [18], clause 7.2.3.2.12					
Use Case ref.:	UC_24							
Pre-test conditions:	UE_AUE_AMGCF	of IMS_A is configured at has IP bearers establish is registered in IMS_A userments within the trust domain A in IMS is busy	hed to its IMS networks as per clause 4.2.1 using any user identity					
	_							
Test Sequence:	Step							
	1	User B calls User A						
	2	Verify that user B is info	ormed that UE_A is busy					

	Interoperability Test Description					
Conformance Criteria:	Check					
	1	TP_IMS_MGCF_01 in CFW step 3 (INVITE): ensure that { when { IUT receives an initial IAM from PSTN } then { IUT sends a INVITE to IMS_A containing a Request_URI indicating Tel_URI_E.164_Number or (Sip_URI_E.164_Number with user_portion_phone) containing a Contact_header indicating anyvalue_GRUU_format and containing a Supported_header including an 100rel_value and containing a P-Asserted-Identity_header and containing a P-Charging-Vector_header indicating an icid-value_parameter and containing a SDP indicating codec_supported and curr_precondition } }				
	2	TP_IMS_MGCF_10 in CFW step 11 (REL): ensure that { when { IUT receives a 486_response from IMS_A} then { IUT sends a REL with (cause17 or cause34) to PSTN } }				



4.5.8.2.4 IMS user holds/resumes call

		Interoperability Test D	escription		
Identifier:	TD_IMS_PSTN_0009				
Summary:	Incoming call from PSTN, communication hold by IMS user				
Configuration:	CF_PSTN				
SUT:	IMS_A and MGCF				
References:	Test Purpose Specification Reference				
		MGCF_11	TS 129 163 [18], clause 7.4.10.1		
		MGCF_12	TS 129 163 [18], clause 7.4.10.1		
Use Case ref.:	UC_24				
Pre-test conditions:	 HSS of IMS_A is configured according to table 1 UE_A has IP bearers established to its IMS networks as per clause 4.2.1 UE_A is registered in IMS_A using any user identity MGCF within the trust domain of IMS_A UE_A configured to perform user initiated hold/resume using INVITE 				
	_				
Test Sequence:	1 2	User B calls User A Verify that user A is informed	of incoming call of Llear B		
	3	Verify that user B is informed			
	4	User A answers the call	triat OL_A is firiging		
	5	Verify that user A and B can	communicate		
	6	User A puts connection to B			
	7	Verify that user A and B cann			
	8	User A resumes connection t			
	9	Verify that user A and B can			
	10		Jser A ends call		
	11	Verify that user B is informed that call has ended			
	12	Verify that user A is informed that call has ended			
Conformance	Check				
Criteria:	1	containing indicate then { IUT sends a CPG ind } }	DATE or a target_refresh INVITE a SDP ing sendonly from IMS_A } licating remote_hold to PSTN		
	2	containing indicati	DATE or a target_refresh INVITE		

Step		Direction						Message	Comment
	U s	U E	I M	M	P		U s		
	e	Ā	S	С	T		e		
	r A		Α	F	N	1	r B		
									Follow UC_21 (1 to 27)
28									User A and B can communicate
29									User A sets B on hold
30		H	\rightarrow					UPDATE/Re-INVITE	UE_A sends UPDATE/Re-INVITE (sendonly) to IMS_A
31				\rightarrow				UPDATE/Re-INVITE	IMS_A forwards UPDATE/Re-INVITE (sendonly) to MGCF
32			\leftarrow					200 OK	MGCF replies 200 OK to IMS_A
33		←			·			200 OK	IMS_A forwards 200 OK to UE_A
34					\longrightarrow			CPG	MGCF sends CPG with remote HOLD
35									User A and B cannot communicate
36			\rightarrow					UPDATE/Re-INVITE	UE_A sends UPDATE/Re-INVITE (sendrecv) to IMS_A
37				\rightarrow	ì			UPDATE/Re-INVITE	IMS_A forwards UPDATE/Re-INVITE (sendrecv) to MGCF
38			\leftarrow	_				200 OK	MGCF replies 200 OK to IMS_A
39		\leftarrow	-					200 OK	IMS_A forwards 200 OK to UE_A
40					\longrightarrow			CPG	MGCF sends CPG with remote RETRIEVE
41									User A and B can communicate
42					ļ	(-		User A ends call
43									Continue UC_21 (29A to 37A)

4.5.8.2.5 PSTN user holds/resumes call

	Intonon and 1110 - Tool	December 1 and 1 a				
	Interoperability Test	Description				
Identifier:	TD_IMS_PSTN_0010					
Summary:	Incoming call from PSTN, communication	ation hold by PSTN user				
Configuration:	CF_PSTN					
SUT:	IMS_A and MGCF					
References:	Test Purpose	Specification Reference				
	TP_IMS_MGCF_13	TS 129 163 [18], clause 7.4.10.2				
	TP_IMS_MGCF_14	TS 129 163 [18], clause 7.4.10.2				
Use Case ref.:	UC_24					
Pre-test	HSS of IMS_A is configured according to table 1					
conditions:	UE_A has IP bearers established to its IMS networks as per clause 4.2.1					
	UE_A is registered in IMS_A using any user identity					
	MGCF within the trust domain of IMS_A					
Test Sequence:	Step					
	1 User B calls User A					
	2 Verify that user A is inform	ed of incoming call of User B				
	3 Verify that user B is inform	ed that UE_A is ringing				

		Interoperability Test Description			
	4	User A answers the call			
		000171 0110110110 0011			
	5	Verify that user A and B can communicate			
	6	User B puts connection to A on hold			
	7	Verify that user A and B cannot communicate			
	8	User B resumes connection to A			
	9	Verify that user A and B can communicate			
	10	User A ends call			
	11	Verify that user B is informed that call has ended			
	12	Verify that user A is informed that call has ended			
Conformance	Check				
Criteria:	1	TP_IMS_MGCF_13 in CFW step 30 (UPDATE):			
		ensure that {			
		when { IUT receives a CPG indicating remote_hold from PSTN }			
		then { IUT sends an UPDATE or a target_refresh INVITE			
		containing a SDP			
		indicating sendonly to IMS_A			
		}			
		}			
	2	TP_IMS_MGCF_14 step 36 (CPG):			
	_	lensure that {			
		when { IUT receives a CPG indicating remote_retrieve from PSTN }			
		then { IUT sends an UPDATE or a target_refresh INVITE			
		containing a SDP			
		indicating sendonly to IMS_A			
		litulcating schooling to livio_A			
		It			

Step		Direction							Message	Comment
	U s e r A		U E A	I M S A	M G C F	F 5 7	В	U s e r B		
										Follow UC_21 (1 to 27)
28										User A and B can communicate
29										User B sets A on hold
30					\leftarrow				CPG	MGCF receives CPG " remote HOLD"
31				\leftarrow					UPDATE/Re-INVITE	MGCF sends UPDATE/Re-INVITE (sendonly) to IMS_A
32			—						UPDATE/Re-INVITE	IMS_A forwards UPDATE/Re-INVITE (sendonly) to UE_A
33				\rightarrow					200 OK	UE_A replies 200 OK to IMS_A
34					\rightarrow				200 OK	IMS_A forwards 200 OK to MGCF
35										User A and B cannot communicate
36					\leftarrow				CPG	MGCF receives CPG "remote RETRIEVE"
37				←					UPDATE/Re-INVITE	MGCF sends UPDATE/Re-INVITE (sendrecv) to IMS_A
38			—						UPDATE/Re-INVITE	IMS_A forwards UPDATE/Re-INVITE (sendrecv) to UE_A
39	ŀ			\rightarrow		•			200 OK	UE_A replies 200 OK to IMS_A
40					\rightarrow				200 OK	IMS_A forwards 200 OK to MGCF
41										User A and B can communicate
42							\leftarrow			User A ends call
										Continue UC_21 (30A to 37A)

History

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