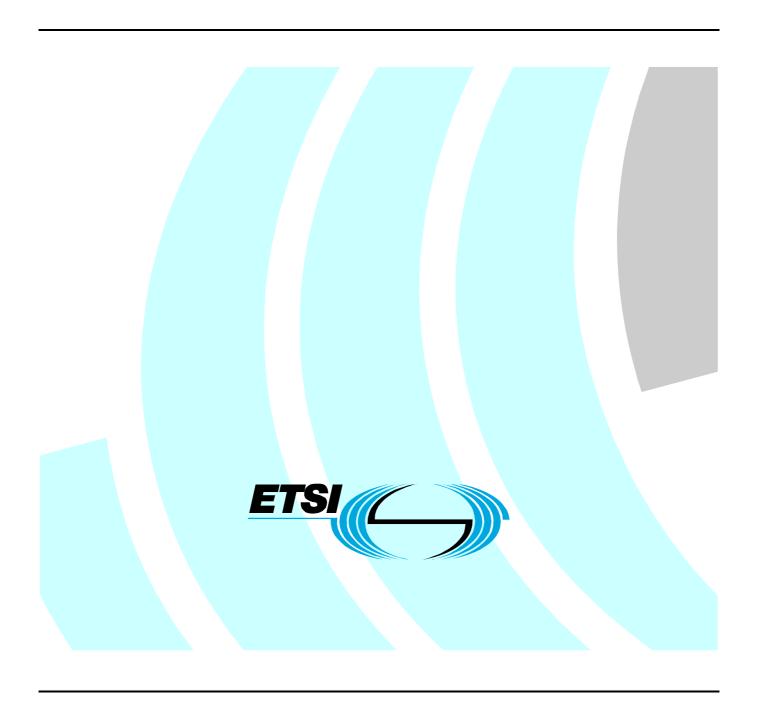
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Foreword

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

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

Part 1: "Test Purposes for IMS NNI Interworking";

Part 2: "Test Descriptions for IMS NNI Interworking";

Part 3: "ATS & PIXIT".

1 Scope

The present document specifies interoperability Test Descriptions (TDs) for IMS NNI interworking for the IP Multimedia Call Control Protocol based on Stage 3 Session Initiation Protocol (SIP) and Session Description Protocol (SDP) standard, TS 124 229 Release 6 [1]. TDs have been specified on the basis of the Test Purposes (TPs) and test suite structure (TSS) presented in [2]. TP fragments presented in the present document as part of TDs are defined using the TPLan notation [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.

The scope of these test descriptions is not to cover all requirements specified in [1]. It has been reduced to cover only requirements which relate to basic IMS call functionality for a minimal interworking IMS CN configuration, i.e. based on a P-CSCF, S-CSCF, I-CSCF, and HSS. Therefore, assessment of, e.g. IMS roaming, topology hiding, etc. at the NNI are not addressed in this test purpose specification. TDs have been only specified for requirements that are observable at the interface between two separate minimal IMS CN implementations, i.e. IMS NNI.

NOTE: Requirements which can only be observed at the interface between UE and IMS CN, i.e. home P-CSCF, 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 a specific reference, subsequent revisions do not apply.
- Non-specific reference may be made only to a complete document or a part thereof and only in the following cases:
 - if it is accepted that it will be possible to use all future changes of the referenced document for the purposes of the referring document;
 - for informative references.

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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 indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

- [1] ETSI TS 124 229 (V6.13.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3 (3GPP TS 24.229 version 6.13.0 Release 6)".
- [2] ETSI TS 186 011-1: "Technical Committee for IMS Network Testing (INT); IMS NNI Interworking Test Specifications; Part 1: Test Purposes for IMS NNI Interworking".
- [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); 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 6)".
- [7] ETSI TS 123 228 (V6.15.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); IP Multimedia Subsystem (IMS); Stage 2 (3GPP TS 23.228 version 6.15.0 Release 6)".
- [8] ETSI TS 133 203 (V6.10.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); 3G security; Access security for IP-based services (3GPP TS 33.203 version 6.10.0 Release 6)".
- [9] ETSI TS 123 060 (V6.15.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); General Packet Radio Service (GPRS); Service description; Stage 2 (3GPP TS 23.060 version 6.15.0 Release 6)".
- [10] ETSI TS 127 060 (V6.0.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Packet domain; Mobile Station (MS) supporting Packet Switched services (3GPP TS 27.060 version 6.0.0 Release 6)".
- [11] IETF RFC 2617: "HTTP Authentication: Basic and Digest Access Authentication".

2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area. For non-specific references, the latest version of the referenced document (including any amendments) applies.

- [i.1] ETSI TR 133 978 (V6.6.0): "Universal Mobile Telecommunications System (UMTS); Security aspects of early IP Multimedia Subsystem (IMS) (3GPP TR 33.978 version 6.6.0 Release 6)".
- [i.2] ETSI TR 123 981 (V6.4.0): "Universal Mobile Telecommunications System (UMTS); Interworking aspects and migration scenarios for IPv4-based IP Multimedia Subsystem (IMS) implementations (3GPP TR 23.981 version 6.4.0 Release 6)".

3 Abbreviations

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

3GPP 3rd Generation Partnership Project
AKA Authentication and Key Agreement
AS (IMS) Application Server
ASO Application Server Origination
AST Termination at Application Server
CF (Test) ConFiguration

CFW Call FloW CN Core Network

CSCF Call Session Control Function

DHCP Dynamic Host Configuration Protocol

DNS Domain Name System
GPRS General Packet Radio Service
HSS Home Subscriber Server
I-CSCF Interrogating CSCF

IMS IP Multimedia Subsystem
IOI Inter Operator Identifier

IP Internet Protocol

IPSEC Internet Protocol SECure transmission

MO Mobile Origination
MT Mobile Termination

NNI Network-to-Network Interface PCO Point Of Control and Observation

P-CSCF Proxy CSCF

PDP Packet Data Protocol

PO POstamble PR PReamble

PRACK Provisional Response Acknowledgement
PSTN Public Switched Telephone Network

SA Security Association S-CSCF Serving CSCF

SDP Session Description Protocol SIP Session Initiation Protocol SUT System Under Test

TB Test Body

TCP Transmission Control Protocol

TD Test Description

TISPAN Telecommunications and Internet converged Services and Protocols for Advanced Networking

TP Test Purpose

TPLan Test Purpose Notation TSS Test Suite Structure

UC Use Case

UDP User Data Protocol 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 124 229 [1].

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 (see TR 123 981 [i.2]).

4.2.2 IP Bearer Establishment

4.2.2.1 3GPP

3GPP bearer establishment procedures imply the creation of a PDP context over GPRS (see TS 123 060 [9] and TS 127 060 [10]).

4.2.3 Authentication and Security

4.2.3.1 3GPP

The current test specification supports standard 3GPP security, namely early IMS (see TR 133 978 [i.1]), full IMS (see TS 133 203 [8]) and optionally allows SIP Digest authentication without key agreement and null authentication. Non-compliance with full IMS security features defined in TS 133 203 [8] 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) of the potential inability to support IPSec on some UE platforms. For those reasons, early IMS is the default security configuration in all test descriptions. Tests may be executed with full IMS security if all required IMS nodes support it.

4.2.4 Registration and Subscription

4.2.4.1 SIP Call Flow

This clause describes the registration call flow under the authentication and security scope described in clause 4.2.3.

4.2.4.1.1 Early IMS Registration and Subscription Call Flow

Early IMS security does not allow SIP requests to be protected using an IPSec security association 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	
-	UE IMS]		
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.	ţĕ
6	+	200 OK	The IMS responds with 200 OK.	Jnprotected
7	+	NOTIFY	The IMS sends initial NOTIFY for registration event	5
			package, containing full registration state	Ju
			information for the registered public user identity in	_
			the XML body.	
8	\rightarrow	200 OK	The UE responds with 200 OK.	

4.2.4.1.2 Full IMS Registration and Subscription Call Flow

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

Step	Direction UE IMS	Message	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.	- 0
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 (see TS 133 203 [8]).	Unprotected
5			Upon receipt of 401 Unauthorized, the UE selects the first integrity and encryption algorithm combination on the list received from the P-CSCF in 401 Unauthorized which is also supported by the UE. If the P-CSCF did not include any confidentiality algorithm in 401 Unauthorized then the UE shall select the NULL encryption algorithm. The UE then proceeds to establish two new pairs of IPSEC security associations (SA1 and SA2).	
6	→	REGISTER	The UE sends another REGISTER with authentication credentials over IPSEC security association SA1.	by SA1
7	+	200 OK	The IMS responds with 200 OK over the same IPSEC security association SA1.	Protected by SA1
8	\rightarrow	SUBSCRIBE	The UE subscribes to its registration event package over the IPSEC security association SA2.	
9	←	200 OK	The IMS responds with 200 OK 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.	

4.2.4.1.3 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	Direc	ction	Message	Comment											
	UE	IMS	1												
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	+		←		401 Unauthorized	The IMS responds with a valid HTTP Digest									
				authentication challenge as defined in											
				TS 123 060 [9].											
5	\rightarrow		\rightarrow		REGISTER	The UE sends another REGISTER with									
				authentication credentials.	8										
6	+		200 OK	The IMS responds with 200 OK.	Jnprotected										
7	\rightarrow		SUBSCRIBE	The UE subscribes to its registration event	ote										
				package.	امّ										
8	←		←		←		←		3 ←		+		200 OK	The IMS responds with 200 OK.	Ď
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	-		200 OK	The UE responds with 200 OK.											

4.2.5 Supported Options

4.2.5.1 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.

4.2.5.2 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.

4.2.5.3 Preconditions

"No precondition" is the default SDP configuration in all test descriptions. Tests may be executed with SDP preconditions if the required nodes support it.

4.2.5.4 Reliable Provisional Responses

Reliable provisional responses (100rel) including the use of the PRACK method are the default signalling configuration in all test descriptions.

4.2.5.5 Forking

Not applicable in the current test specification. However, support for forking is a requirement of the IMS specification.

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 is the interface under observation for NNI interoperability testing.

4.3.1 Core IMS Nodes

Because the current testing scope excludes IMS roaming and border control functionality, P-CSCF, S-CSCF, I-CSCF, and HSS are considered to be within a "black box" for testing purposes. We refer to this System Under Test (SUT) as "the minimal IMS". Interfaces within the IMS are considered internal and not observable for testing purposes. The use cases and test descriptions described below may be run with IMS roaming without modifications. Due to the limited scope, no test descriptions are available that validate the operation of the Mw interface between the P-CSCF and S-CSCF as an NNI interface, i.e. in a roaming configuration.

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. Although considered as internal and not explicitly involved in current NNI test configurations which exclude IMS roaming, it is recommended that the Mw interface between the P-CSCF and S-CSCF be exposed/available for troubleshooting purposes.

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. The Mw interface between the S-CSCF and either I- or S-CSCF in another domain is used as a point of observation against which NNI interoperability tests are validated. The Mw interfaces between I- and S-CSCFs within the same network are considered as internal IMS interfaces. Although considered as internal and not explicitly involved in current NNI test configurations which exclude IMS roaming, it is recommended that the Mw interface between the P-CSCF and S-CSCF be exposed for troubleshooting purposes.

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 HSS

4.3.1.3.1 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.

4.3.1.3.2 Node Configuration

The HSS should be configured within the IMS to interact with CSCFs as required using DIAMETER Cx interfaces. For the purpose of this test specification, "ims-a.net" refers to the domain served by "IMS_A" and "ims-b.net" refers to the domain served by "IMS_B". Users should be provisioned to match the sample profiles listed in table 1. All public identities belong to the same implicitly registered set.

Table 1: HSS sample user profiles for IMS_A

IMS Domain	Private Identity	Public Identity 1 (SIP URI)	Public Identity 2 (Tel URI)	Default Public Identity	Filter criteria
ims-a.net	user_1_priv@ims-a.net	sip:user_1_pub@ims-a.net	na	1	na
ims-a.net	user 2 priv@ims-a.net	sip:user_2_pub@ims-a.net	tel:+3363334827 3	1	na
ims-a.net	user 3 priv@ims-a.net	sip:user_3_pub@ims-a.net	tel:+3363334827 4	2	na
ims-a.net	user_4_priv@ims-a.net	sip:user_4_pub@ims-a.net	na	1	terminating_unregistered/INVI TE/ SESSION_TERMINATED/ as-1.ims-a.net
ims-a.net	user_5_priv@ims-a.net	sip:user_5_pub@ims-a.net	na	1	

Table 2: HSS sample user profiles for IMS_B

IMS Domain	Private Identity	Public Identity 1 (SIP URI)	Public Identity 2 (Tel URI)	Default Public Identity	Filter criteria
ims-b.net	user_1_priv@ims-b.net	sip:user_1_pub@ims-b.net	na	1	
ims-b.net	user 2 priv@ims-b.net	sip:user_2_pub@ims-b.net	tel:+4474445938 4	1	
ims-b.net	user 3 priv@ims-b.net	sip:user_3_pub@ims-b.net	tel:+4474445938 5	2	
ims-b.net	user_4_priv@ims-b.net	sip:user_4_pub@ims-b.net	na	1	terminating_unregistered/INV ITE/ SESSION_TERMINATED/ as-2.ims-b.net
ims-b.net	user_5_priv@ims-b.net	sip:user_5_pub@ims-b.net	na	1	

4.3.2 External IMS 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 UEs support reliable provisional responses (100rel) including the PRACK method basic call and messaging functionality, call hold based on UPDATE as well as re-INVITE method, and message transport via UDP as well as TCP. In the case that a UE does not meet one or more of these features, only a selected subset of the test descriptions in ths 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

The application server (AS) is considered to act as a stimulus node in this test specification. The ISC interface between the S-CSCF and the AS is used as a Point Of Control and Observation (PCO) 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.

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 the present document.

4.3.3.1.2 Node Configuration

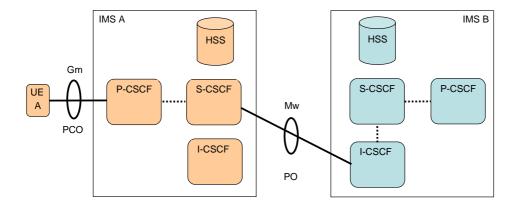
DNS should be configured for appropriate resource record handling as required to support proper resolution of all SIP URIs in Request URIs and Route headers. In addition, DNS must support ENUM functionality in order to resolve Tel URIs into SIP URIs. As an example, DNS_B should have an entry to map E.164 number 44744459384 with user user_2_priv@ims-b.net.

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 SUT(s) connectivity and associated UE(s), AS(s), and DNS(s).

The following guidelines are used to describe the test configurations:

- Named based convention defined in TS 123 228 [7], clause 5.5.1.
- Reuse the following abbreviations:
 - SS1: Different network operators performing origination and termination.
 - MO2: Mobile Origination, home. The "Originating Network" of S-S#1 is therefore the home network.
 - ASO: Application Server Origination. The" Originating Network" of S-S#1 is the home network.
 - MT2: Mobile Termination, located in home service area. The "Terminating Network" of S-S#1 is the home network.
 - AST4: Termination at Application Server based on service logic.
- Exclude PSTN, non-IMS endpoints and IMS roaming since these are out of scope.
- Further differentiate IMS NNI observation points based on:
 - IN: initial request/response for a dialog.
 - SU: subsequent requests/responses in a dialog.
 - ST: standalone requests/response.
- And indicate:
 - Observable interfaces as a solid line.
 - Non-observable interfaces as dashed lines.



Precondition:

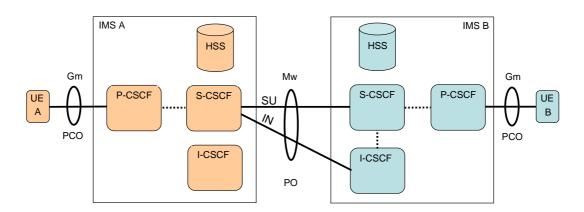
Different network operators performing origination and termination (SS1), UE_A in Home network A (MO2), UE_A registered, neither AS nor THIG nor IMS-ALG involved

Test configuration for:

Unsuccessful initial requests and responses from UE_A Example:

Initial INVITE in IMS VoIP voice call from UE_A to non-existing user

Figure 1: CF_MO2-SS1



Precondition:

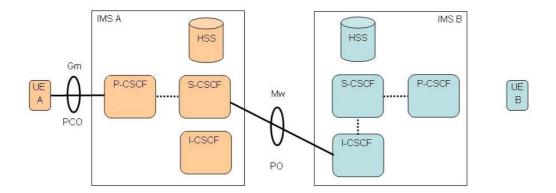
Different network operators performing origination and termination (SS1), UE_A in Home network A (MO2), UE_B in Home network B (MT2), both UEs registered, neither AS nor THIG nor IMS-ALG involved, in SU case dialog initiated between UE_A and UE_B

Test configuration for:

Initial (IN) and Subsequent (SU) requests and responses between UE_A and UE_B Example:

IN: Initial INVITE in IMS VoIP voice call from UE_A to UE_B SU: BYE request, UE_B terminates IMS VoIP call towards UE_B

Figure 2: CF_MO2-SS1-MT2



Precondition:

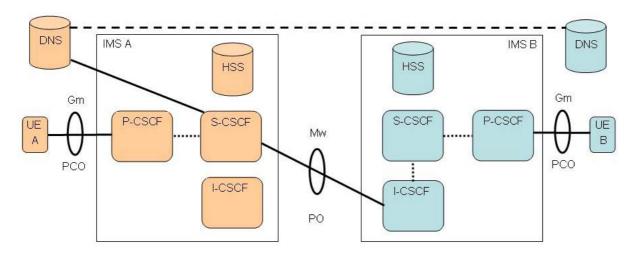
Different network operators performing origination and termination (SS1), UE_A in Home network A (MO2), UE_B in Home network B (MT2), only UE_A registered, neither AS nor THIG nor IMS-ALG involved, in SU case dialog initiated between UE_A and UE_B

Test configuration for:
Unsuccessful initial requests and responses from UE_A

Example

Initial INVITE in IMS VoIP voice call from UE_A

Figure 3: CF_MO2-SS1-MT2b



Precondition:

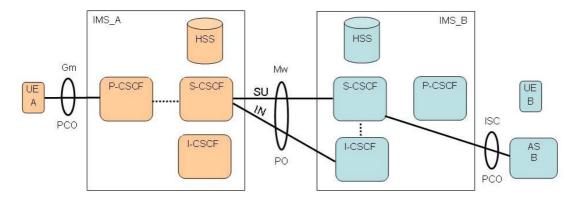
Different network operators performing origination and termination (SS1), UE_A in Home network A (MO2), UE_B in Home network B (MT2), both UEs registered, DNS server involved in network B, neither AS nor THIG nor IMS-ALG involved, in SU case dialog initiated between UE_A and UE_B Test configuration for:

Initial requests and responses between UE A and UE B

Example:

Initial INVITE in IMS VoIP voice call from UE A

Figure 4: CF_MO2-SS1-MT2c



Precondition:

Different network operators performing origination and termination (SS1), UE_A in Home network A (MO#2), UE_B in Home network B (MT#2), AS_B discovered based on service logic in Home network B (AST#4), only UE_A registered, in SU case dialog initiated between UE_A and AS_B, neither THIG nor IMS-ALG involved

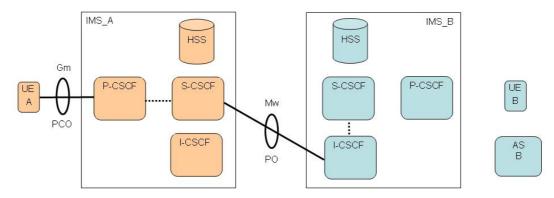
Test configuration for:

Initial (IN) and Subsequent (SU) requests and responses between UE_A and AS_B Example:

IN: Initial INVITE, IMS VoIP voice call from UE_A forwarded to AS_B as a result of filter criteria. ASB acts as routing AS

SU: BYE request, UE_A terminates IMS VoIP voice call towards AS_B

Figure 5: CF_MO2-SS1-MT2-AST4



Precondition:

Different network operators performing origination and termination (SS1), UE_A in Home network A (MO#2), UE_B in Home network B (MT#2), AS_B discovered based on service logic in Home network B (AST#4), only UE_A registered, AS_B not responding, neither THIG nor IMS-ALG involved Test configuration for:

Initial (IN) and Subsequent (SU) requests and responses between UE_A and AS_B Example:

IN: Unsuccessful initial INVITE, IMS VoIP voice call from UE_A forwarded to AS_B as a result of filter criteria but no response.

Figure 6: CF_MO2-SS1-MT2-AST4b

NOTE: The configuration CF_MO2-SS1-MT2-AST4b does not require a physical application server for IMS B. Filter criteria in IMS B should only be set to forward SIP messages to an IP address which does not respond to forwarded SIP messages.

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, DNS, and ISC interfaces. Test sequence and call flow are correlated using grey shading.

All of the use cases presented in this clause that involve UE interaction assume are assumed to follow one of the registration and subscriptions described in clause 4.2.4 for each UE involved in the test. They are not shown here.

Test descriptions defined in clause 5 then reference and specialize one of these 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 User-initiated VoIP call setup and release

4.4.1.1 Normal Call

4.4.1.1.1 Description

UE_A places an IMS VoIP call to UE_B. Once the media path is established, the originating user releases the call. We assume support for reliable provisional responses (100rel) and no SDP preconditions. The call flow path and node configuration for this use case corresponds to CF_MO2-SS1-MT2.

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

1	User A calls User B (CFW step 1)
2	User B is informed of incoming call of User A (CFW step 8)
3	User A is informed that UE_B is ringing (CFW step 12)
4	User B answers call (CFW step 19)
5	User A is presented that call in process (CFW step 23)
6	User B is informed that the call is in progress (CFW step 27)
7	User A ends call (CFW step 28)
8	User B is informed that call has ended (CFW step 32)

4.4.1.1.2 UC_01: SIP Call Flow "Normal Call"

For a call with reliable provisional responses (100rel) and no SDP preconditions, the expected sequence is:

Step	Direction					Message	Comment		
	U	U	I	I	Ţ	J	U	<u> </u>	
	s		M	M	ı İı	Ε	s		
	е	Α				3	е		
	r		Α	В	;		r		
	Α		1				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 UE_A
									supports
3			\leftarrow					100 Trying	IMS_A P-CSCF responds with a 100 Trying
									provisional response
4				\rightarrow				INVITE	IMS_A S-CSCF forwards INVITE to IMS_B I-CSCF
5				\leftarrow				100 Trying	IMS_B I-CSCF responds with a 100 Trying
									provisional response
6					\rightarrow			INVITE	IMS_B P-CSCF forwards INVITE to UE_B
7					\rightarrow			100 Trying	UE_B responds with a 100 Trying provisional
									response
8						\rightarrow			User B is informed of incoming call of User A
9					\leftarrow			180 Ringing	UE_B responds to initial INVITE with 180 Ringing to
									indicate that it has started alerting
10				\leftarrow				180 Ringing	IMS_B S-CSCF forwards 180 Ringing response to
									IMS_A S-CSCF
11			\leftarrow					180 Ringing	IMS_A P-CSCF forwards the 180 Ringing response
									to UE_A
12		(User A is informed that UE_B is ringing
13			\rightarrow					PRACK	UE_A acknowledges the receipt of 180 response by
									sending PRACK
14				\rightarrow				PRACK	IMS_A S-CSCF forwards PRACK to IMS_B
									S-CSCF
15					\rightarrow			PRACK	IMS_B P-CSCF forwards PRACK to UE_B
16					\rightarrow			200 OK	UE_B responds PRACK with 200 OK

Step	Direction			on		Messa	ge Comment	
	U	U	I	I	1 E	J	J	
	s	Е	М	N	1 E	Ξ	3	
	е	Α	S	S		_		
	r		Α	В	3			
	Α	<u> </u>	<u> </u>	<u>Į</u> ,			3	110 7 0 0007 () 000 01/
17				←			200 OK	IMS_B S-CSCF forwards 200 OK response to IMS_A S-CSCF
18		1	+				200 OK	IMS_A P-CSCF forwards the 200 OK response to UE_A
19						\leftarrow		User B answers call
20					(200 OK	UE_B responds INVITE with 200 OK to indicate that
								the call has been answered
21				+			200 OK	IMS_B S-CSCF forwards 200 OK response to
								IMS_A S-CSCF
22		'	←				200 OK	IMS_A P-CSCF forwards the 200 OK response to UE_A
23		(User A is presented that call in process
24		-	→				ACK	UE_A acknowledges the receipt of 200 OK for INVITE
25				\rightarrow			ACK	IMS_A S-CSCF forwards ACK to IMS_B S-CSCF
26					\rightarrow		ACK	IMS_B P-CSCF forwards ACK to UE_B
27						\rightarrow		User B is informed that the call is in progress
28		\rightarrow						User A ends call
29		-	→				BYE	UE_A releases the call with BYE
30				\rightarrow			BYE	IMS_A S-CSCF forwards BYE to IMS_B S-CSCF
31					\rightarrow		BYE	IMS_B P-CSCF forwards BYE to UE_B
32						\rightarrow		User B is informed that call has ended
33					\leftarrow		200 OK	UE_B sends 200 OK for BYE
34				\			200 OK	IMS_B S-CSCF forwards 200 OK response to IMS_A S-CSCF
35		•	+				200 OK	IMS_A P-CSCF forwards the 200 OK response to UE_A

4.4.1.2 Temporarily unavailable

4.4.1.2.1 Description

 $\label{thm:configuration} UE_A \ places \ an \ IMS \ VoIP \ call \ to \ UE_B. \ UE_B \ is \ not \ registered. \ The \ call \ flow \ path \ and \ node \ configuration \ for \ this \ use \ case \ corresponds \ to \ CF_MO2-SS1-MT2.$

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

1	User A calls User B (CFW step 1)
2	User A is informed of User B unreachable (CFW step 8)

4.4.1.2.2 UC_02: SIP Call Flow "Temporarily unavailable"

Step		D	ire	ctio	n		Message	Comment
	U s e r A	U E A	I M S A	I M S B	U E B	U s e r B		
1		\rightarrow						User A calls User B
2		•)				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 P-CSCF responds with a 100 Trying provisional response
4			-	\rightarrow			INVITE	IMS_A S-CSCF forwards INVITE to IMS_B I-CSCF
5			•	+			100 Trying	IMS_B I-CSCF responds with a 100 Trying provisional response
6			1	+			480 Temporarily unavailable	IMS_B I-CSCF generates error message indicating unavailable user
7			\leftarrow				480 Temporarily unavailable	IMS_A P-CSCF forwards error response to UE_A
8		+						User A is informed of User B unreachable

4.4.1.3 Temporarily unavailable (Application Server)

4.4.1.3.1 Description

UE_A places an IMS VoIP call to UE_B. UE_B is not registered. The call flow path and node configuration for this use case corresponds to CF_MO2-SS1-MT2.

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

1	User A calls User B (CFW step 1)
2	User A is informed of User B unreachable (CFW step 8)

4.4.1.3.2 UC_03: SIP Call Flow "Temporarily unavailable" (Application Server)

Step	Direction						Message	Comment
•	U s e r A	U E A	M S A	I M S B	U E B	U s e r B		
1		↑						User A calls User B
2		-	→				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 P-CSCF responds with a 100 Trying provisional response
4			-	>			INVITE	IMS_A S-CSCF forwards INVITE to IMS_B I-CSCF
5			•	÷			100 Trying	IMS_B I-CSCF responds with a 100 Trying provisional response
6			•	+			408 Request Timeout or 5xx Response	IMS_B I-CSCF forwards S-CSCF error message indicating unreachable AS
7		1	—				408 Request Timeout or 5xx Response	IMS_A P-CSCF forwards error response to UE_A
8		-						User A is informed of "not reachable"

4.4.1.4 Cancelled session setup

4.4.1.4.1 Description

UE_A places an IMS VoIP call to UE_B. The call request will be cancelled by UE_A before the call is answered. The call flow path and node configuration for this use case corresponds to CF_MO2-SS1-MT2.

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

1	User A calls User B (CFW step 1)
2	User B is informed of incoming call of User A (CFW step 8)
3	User A is informed that UE_B is ringing (CFW step 12)
4	User A cancel ringing (CFW step 19)
5	User B informed that call is aborted (CFW step 26)

4.4.1.4.2 UC_04: SIP Call Flow "Cancelled"

Step			Dire	ctic	on		Message	Comment
	U	U	I	I	l		J Company	
	s	Е				E 9	3	
	е	Α	S	S				
	r		Α	В		<u> </u>		
1	Α	\rightarrow	1				3	User A calls User B
2		-	\rightarrow				INVITE	UE_A sends INVITE with the first SDP offer
							III VIII L	indicating all desired medias and codecs that UE_A
								supports
3			←				100 Trying	IMS_A P-CSCF responds with a 100 Trying
			-				1.00yg	provisional response
4				\rightarrow			INVITE	IMS_A S-CSCF forwards INVITE to IMS_B I-CSCF
5				←			100 Trying	IMS_B I-CSCF responds with a 100 Trying
							, ,	provisional response
6					\rightarrow		INVITE	IMS_B P-CSCF forwards INVITE to UE_B
7		Ì			(100 Trying	UE_B responds with a 100 Trying provisional
								response
8						\rightarrow		User B is informed of incoming call of User A
9					\leftarrow		180 Ringing	UE_B responds to initial INVITE with 180 Ringing to
								indicate that it has started alerting
10				+			180 Ringing	IMS_B S-CSCF forwards 180 Ringing response to
								IMS_A S-CSCF
11			←				180 Ringing	IMS_A P-CSCF forwards the 180 Ringing response
		,						to UE_A
12		+					DD 4 014	User A is informed that UE_B is ringing
13			\rightarrow				PRACK	UE_A acknowledges the receipt of 180 response by sending PRACK
14				→	-	-	PRACK	IMS_A S-CSCF forwards PRACK to IMS_B
14				7			PRACK	S-CSCF IOTWARDS PRACK TO TWIS_B
15					\rightarrow		PRACK	IMS_B P-CSCF forwards PRACK to UE_B
16					\leftarrow		200 OK	UE_B responds PRACK with 200 OK
17				-			200 OK	IMS_B S-CSCF forwards 200 OK response to
								IMS_A S-CSCF
18			\leftarrow				200 OK	IMS_A P-CSCF forwards the 200 OK response to
								UE_A
19		\rightarrow						User A cancel ringing
20			\rightarrow				CANCEL	UE_A sends CANCEL to abort call
21			\leftarrow				200 OK	IMS_A P-CSCF responds with a 200 OK response
22				\rightarrow			CANCEL	IMS_A S-CSCF sends CANCEL to IMS_B S-CSCF
23				\leftarrow			200 OK	IMS_B S-CSCF responds with a 200 OK response
24					\rightarrow		CANCEL	IMS_B P-CSCF sends CANCEL to UE_B
25					\leftarrow		200 OK	UE_B responds with a 200 OK response
26						\rightarrow		User B informed that call is aborted
27					\leftarrow		487 Request Terminated	UE_B confirms cancellation of the INVITE request
								with a 487 Request Terminated error response

Step		D	ire	ctio	n		Message	Comment
	U	U	I	I	U	U		
	s	Ε	M	M	E	s		
	е	Α	S	S	В	е		
	r		Α	В		r		
	Α					В		
28				-	>		ACK	IMS_B P-CSCF responds with an ACK to UE_B
29				\leftarrow			487 Request Terminated	IMS_B S-CSCF sends a 487 Request Terminated
								error response to IMS_A S-CSCF
30				\rightarrow			ACK	IMS_A S-CSCF responds with an ACK
31			\leftarrow				487 Request Terminated	IMS_B P-CSCF sends a 487 Request Terminated
							•	error response to UE_A
32							ACK	UE_A responds with an ACK

4.4.1.5 Not Found

4.4.1.5.1 Description

UE_A places an IMS VoIP call to UE_B. UE_B is no user of IMS_B. The call flow path and node configuration for this use case corresponds to CF_MO2-SS1-MT2.

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

1	User A calls User B (CFW step 1)
2	User A is informed of User B unreachable (CFW step 8)

4.4.1.5.2 UC_05: SIP Call Flow "Not Found"

Step		D	ire	ctio	n		Message	Comment
-	U s e r A	U E A	M S A	I M S B	U E B	U s e r B		
1		\rightarrow						User A calls User B
2		-)				INVITE	UE_A sends INVITE with the first SDP offer indicating all desired medias and codecs that UE_A supports
3		1	+				100 Trying	IMS_A P-CSCF responds with a 100 Trying provisional response
4			-	\rightarrow			INVITE	IMS_A S-CSCF forwards INVITE to IMS_B I-CSCF
5			•	+			100 Trying	IMS_B I-CSCF responds with a 100 Trying provisional response
6			Ī	+			404 Not Found or 604 Does not exist anywhere	IMS_B I-CSCF generates error message indicating non-existent user
7		1	+				404 Not Found or 604 Does not exist anywhere	IMS_A P-CSCF forwards error response to UE_A
8		\leftarrow						User A is informed of "no such user"

4.4.2 User-initiated call hold and resume

UE_A places an IMS VoIP call to UE_B. Once the media path is established, the originating user puts the call on hold, stopping the media stream. The originating user then resumes the call. The call flow path and node configuration for this use case corresponds to CF_MO2-SS1-MT2. We assume reliable provisional responses (100rel) and no SDP preconditions. Depending on the UE this feature may be implemented either using reINVITE or UPDATE where UPDATE is only an optional feature.

4.4.2.1 User-initiated call hold and resume with reINVITE

4.4.2.1.1 Description

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

A (O)
lser A calls User B (CFW step 1)
Iser B is informed of incoming call of User A (CFW step 8)
ser A is informed that UE_B is ringing (CFW step 12)
ser B answers call (CFW step 19)
ser A is presented that call is in progress (CFW step 23)
ser B is presented that call is in progress (CFW step 27)
ser A puts call on hold (CFW step 28)
ser B is informed that call on hold (CFW step 35)
ser A resumes call (CFW step 42)
Iser B is informed the call is resumed (CFW step 49)
ser A is informed that call is resumed (CFW step 53)
ser A ends call (CFW step 57)
ser B is informed the call has ended (CFW step 61)

4.4.2.1.2 UC_06: SIP Call Flow "call hold and resume" with reINVITE

Step			ire	ctic	n		Message	Comment
•	U	U	I	I	U		Ţ.	
	s		М	M	E	s		
	е	Α	S	S		1 -		
	r		Α	В		r		
4	Α	\rightarrow			1	В		Llass Assella Llass D
2					_		INNATE	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 P-CSCF responds with a 100 Trying
								provisional response
4				\rightarrow			INVITE	IMS_A S-CSCF forwards INVITE to IMS_B I-CSCF
5				←			100 Trying	IMS_B I-CSCF responds with a 100 Trying
								provisional response
6)		INVITE	IMS_B P-CSCF forwards INVITE to UE_B
7					+		100 Trying	UE_B responds with a 100 Trying provisional
								response
8					_		1400 Bt	User B is informed of incoming call of User A
9				•	—		180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting
10				←			180 Ringing	IMS_B S-CSCF forwards 180 Ringing response to IMS_A S-CSCF
11			←				180 Ringing	IMS_A P-CSCF forwards the 180 Ringing response
		_						to UE_A
12		+					DD 4 OLY	User A is informed that UE_B is ringing
13			\rightarrow				PRACK	UE_A acknowledges the receipt of 180 response by sending PRACK
14				\rightarrow			PRACK	IMS_A S-CSCF forwards PRACK to IMS_B S-CSCF
15)		PRACK	IMS_B P-CSCF forwards PRACK to UE_B
16					←		200 OK	UE_B responds to PRACK with 200 OK
17				←			200 OK	IMS_B S-CSCF forwards 200 OK response to IMS_A S-CSCF
18			←				200 OK	IMS_A P-CSCF forwards the 200 OK response to UE_A
19)		User B answers call
20		Ī		•	\leftarrow		200 OK	UE_B responds to INVITE with 200 OK to indicate
								that the call has been answered
21				←			200 OK	IMS_B S-CSCF forwards 200 OK response to IMS_A S-CSCF

	D	Direction				Message	Comment
U	U	I	I				
r	^	Ā	В	֓֟֟֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓			
Α							
		←				200 OK	IMS_A P-CSCF forwards the 200 OK response to UE_A
	←						User A is presented that call is in progress
		→				ACK	UE_A acknowledges the receipt of 200 OK for
							INVITE
		-		_			IMS_A S-CSCF forwards ACK to IMS_B S-CSCF
				→		ACK	IMS_B P-CSCF forwards ACK to UE_B
	${\leftarrow}$				기		User B is presented that call is in progress User A puts call on hold
	_	\rightarrow				INVITE	UE_A sends reINVITE message indicating media
							stream inactive (Call Hold)
		←				100 Trying	IMS_A P-CSCF responds with a 100 Trying
							provisional response
							IMS_A S-CSCF forwards INVITE to IMS_B S-CSCF
			\leftarrow			100 Trying	IMS_B S-CSCF responds with a 100 Trying
				_		INIVITE	provisional response IMS_B P-CSCF forwards INVITE to UE_B
							UE_B responds with a 100 Trying provisional
				`		100 Trying	response
							User B is informed that call on hold
				←		200 OK	UE_B responds to INVITE with 200 OK indicating
							media stream inactive
			\leftarrow			200 OK	IMS_B S-CSCF forwards 200 OK response to
		_				200 014	IMS_A S-CSCF
							IMS_A P-CSCF forwards the 200 OK response to UE_A
						ACK	UE_A acknowledges the receipt of 200 OK for INVITE
						ACK	IMS_A S-CSCF forwards ACK to IMS_B S-CSCF
				\rightarrow		ACK	IMS_B P-CSCF forwards ACK to UE_B
		_				INNATE	User A resumes call
		7				INVITE	UE_A sends reINVITE message indicating media stream active (Call Resume)
		\leftarrow				100 Trying	IMS_A P-CSCF responds with a 100 Trying
							provisional response
						INVITE	IMS_A S-CSCF forwards INVITE to IMS_B S-CSCF
		•	\leftarrow			100 Trying	IMS_B S-CSCF responds with a 100 Trying
						INDUITE	provisional response
	\dashv	\dashv					IMS_B P-CSCF forwards INVITE to UE_B UE_B responds with a 100 Trying provisional
				`		100 frying	response
							User B is informed the call is resumed
				(200 OK	UE_B responds to UPDATE with 200 OK indicating media stream active
		1	(200 OK	IMS_B S-CSCF forwards 200 OK response to
		\perp			_	300 OK	IMS_A S-CSCF IMS_A P-CSCF forwards the 200 OK response to
						200 OK	UE_A
		_					User A is informed that call is resumed
		→				ACK	UE_A acknowledges the receipt of 200 OK for INVITE
		<u> </u>	→			ACK	IMS_A S-CSCF forwards ACK to IMS_B S-CSCF
				\rightarrow		ACK	IMS_B P-CSCF forwards ACK to UE_B
		\downarrow				DVE	User A ends call
			_				UE_A releases the call with BYE
		_	7	→			IMS_A S-CSCF forwards BYE to IMS_B S-CSCF IMS_B P-CSCF forwards BYE to UE_B
							User B is informed the call has ended
				(200 OK	UE_B sends 200 OK for BYE
	s e r A	U E A A A A A A A A A A A A A A A A A A	U S E A A A A A A A A A A A A A A A A A A	U S E A S E S E S E S E S E S E S E S E S	U E A S B E S S S S S S S S S S S S S S S S S	U S E A S B S E E F B S E	U

Step	Direction						Message	Comment
	U	U	I	I	U	U		
	s	Ε	M	М	Ε	s		
	е	Α	S	S	В	е		
	r		Α	В		r		
	Α					В		
63			•	Ţ			200 OK	IMS_B S-CSCF forwards 200 OK response to
								IMS_A S-CSCF
64			(200 OK	IMS_A P-CSCF forwards the 200 OK response to
								UE_A ·

4.4.2.2 User-initiated call hold and resume with UPDATE

4.4.2.2.1 Description

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

1	User A calls User B (CFW step 1)
2	User B is informed of incoming call of User A (CFW step 8)
3	User A is informed that UE_B is ringing (CFW step 12)
4	User B answers call (CFW step 19)
5	User A is informed that call is in progress (CFW step 23)
6	User B is informed that call is in progress (CFW step 27)
7	User A put call on hold (CFW step 28)
8	User B is informed that call on hold (CFW step 32)
9	User A resumes call (CFW step 36)
10	User B is informed the call is resumed (CFW step 40)
11	User A is informed that call is resumed (CFW step 44)
12	User A ends call (CFW step 45)
13	User B is informed the call has ended (CFW step 49)

4.4.2.2.2 UC_07: SIP Call Flow "call hold and resume" with UPDATE

The expected sequence:

Step		D	ire	ctio	n		Message	Comment
	U s e r A	U E A	I M S A	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 UE_A supports
3			+				100 Trying	IMS_A P-CSCFW responds with a 100 Trying provisional response
4)			INVITE	IMS_A S-CSCF forwards INVITE to IMS_B I-CSCF
5			,	+			100 Trying	IMS_B I-CSCF responds with a 100 Trying provisional response
6				-	>		INVITE	IMS_B P-CSCF forwards INVITE to UE_B
7				•	Т		100 Trying	UE_B responds with a 100 Trying provisional response
8					\rightarrow			User B is informed of incoming call of User A
9				•			180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting
10			1	+			180 Ringing	IMS_B S-CSCF forwards 180 Ringing response to IMS_A S-CSCF
11			+				180 Ringing	IMS_A P-CSCF forwards the 180 Ringing response to UE_A
12		(User A is informed that UE_B is ringing

Step		D	irection			tion Message			Comment
	U	U	I	I			U	<u> </u>	
	s		M	N	1		S		
	е	Α	S	S		В	е		
	r A		Α	В	5		r B		
13			\rightarrow					PRACK	UE_A acknowledges the receipt of 180 response by
14				\rightarrow				PRACK	sending PRACK IMS_A S-CSCF forwards PRACK to IMS_B
15					\rightarrow			PRACK	S-CSCF IMS_B P-CSCF forwards PRACK to UE_B
16					<u> </u>			200 OK	UE_B responds to PRACK with 200 OK
17				←	_			200 OK	IMS_B S-CSCF forwards 200 OK response to
				`					IMS_A S-CSCF
18			←					200 OK	IMS_A P-CSCF forwards the 200 OK response to UE_A
19									User B answers call
20					←			200 OK	UE_B responds to INVITE with 200 OK to indicate that the call has been answered
21				+				200 OK	IMS_B S-CSCF forwards 200 OK response to IMS_A S-CSCF
22			←					200 OK	IMS_A P-CSCF forwards the 200 OK response to UE_A
23		←							User A is informed that the call is in progress
24		_	\rightarrow					ACK	UE_A acknowledges the receipt of 200 OK for INVITE
25				\rightarrow				ACK	IMS_A S-CSCF forwards ACK to IMS_B S-CSCF
26					\rightarrow			ACK	IMS_B P-CSCF forwards ACK to UE_B
27						\rightarrow		7.01.	User B is informed that call is in progress
28		\rightarrow							User A put call on hold
29			\rightarrow					UPDATE	UE_A sends UPDATE message indicating media stream inactive (Call Hold)
30				\rightarrow				UPDATE	IMS_A S-CSCF forwards UPDATE to IMS_B S-CSCF
31					\rightarrow			UPDATE	IMS_B P-CSCF forwards UPDATE to UE_B
32						\rightarrow		01 5/112	User B is informed that call on hold
33					(200 OK	UE_B responds to UPDATE with 200 OK indicating
									media stream inactive
34				+				200 OK	IMS_B S-CSCF forwards 200 OK response to IMS_A S-CSCF
35			\leftarrow					200 OK	IMS_A P-CSCF forwards the 200 OK response to
									UE_A
36		\rightarrow							User A resumes call
37			\rightarrow					UPDATE	UE_A sends UPDATE message indicating media
				_					stream active (Call Resume)
38				\rightarrow				UPDATE	IMS_A S-CSCF forwards UPDATE to IMS_B S-CSCF
39					\rightarrow			UPDATE	IMS_B P-CSCF forwards UPDATE to UE_B
40						\rightarrow			User B is informed the call is resumed
41					←			200 OK	UE_B responds to UPDATE with 200 OK indicating media stream active
42				+				200 OK	IMS_B S-CSCF forwards 200 OK response to IMS_A S-CSCF
43			(200 OK	IMS_A P-CSCF forwards the 200 OK response to UE_A
44		←							User A is informed that call is resumed
45		<u>`</u>							User A ends call
46			\rightarrow					BYE	UE_A releases the call with BYE
47				\rightarrow				BYE	IMS_A S-CSCF forwards BYE to IMS_B S-CSCF
48					\rightarrow			BYE	IMS_B P-CSCF forwards BYE to UE_B
49						\rightarrow			User B is informed the call has ended
50					\leftarrow			200 OK	UE_B sends 200 OK for BYE
51				+				200 OK	IMS_B S-CSCF forwards 200 OK response to IMS_A S-CSCF
52			(200 OK	IMS_A P-CSCF forwards the 200 OK response to UE_A

4.4.3 S-CSCF initiated session release

4.4.3.1 Release from originating network

4.4.3.1.1 Description

UE_A places an IMS VoIP call to UE_B. Once the media path is established, the session is released by the originating network through a forced user de-registration at the HSS in IMS_A. The call flow path and node configuration for this use case corresponds to CF_MO2-SS1-MT2. We assume provisional responses (100rel) and no SDP preconditions.

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

1	User A calls User B (CFW step 1)
2	User B is informed of incoming call of User A (CFW step 8)
3	User A is informed that UE_B is ringing (CFW step 12)
4	User B answers call (CFW step 19)
5	User A is informed that the call is in progress (CFW step 23)
6	User B is informed that call is in progress (CFW step 27)
7	User B is informed the call has ended (CFW step 30)
8	User A is informed the call has ended

4.4.3.1.2 UC_08: SIP Call flow for Session release from originating network

Step		D	ire	ctic	n		Message	Comment
	U	U	Ι	Π	U			
	s	E A	M	M	E	s		
	е	Α	S	S	В	_		
	r A		Α	В		r B		
1		\rightarrow		4		무		User A calls User B
2			\rightarrow				INVITE	UE_A sends INVITE with the first SDP offer
_							INVIIL	indicating all desired medias and codecs that UE_A
								supports
3			\leftarrow				100 Trying	IMS_A P-CSCF responds with a 100 Trying
			-					provisional response
4			1)			INVITE	IMS_A S-CSCF forwards INVITE to IMS_B I-CSCF
5				-			100 Trying	IMS_B I-CSCF responds with a 100 Trying
								provisional response
6					→		INVITE	IMS_B P-CSCF forwards INVITE to UE_B
7				•	-		100 Trying	UE_B responds with a 100 Trying provisional
								response
8)		User B is informed of incoming call of User A
9				•	-		180 Ringing	UE_B responds to initial INVITE with 180 Ringing to
40				,	_		400 Diamin n	indicate that it has started alerting
10			,	←			180 Ringing	IMS_B S-CSCF forwards 180 Ringing response to
11			←		-	+	180 Ringing	IMS_A S-CSCF IMS_A P-CSCF forwards the 180 Ringing response
''			`				160 Kinging	to UE_A
12		(User A is informed that UE_B is ringing
13		_	\rightarrow				PRACK	UE_A acknowledges the receipt of 180 response by
								sending PRACK
14				→			PRACK	IMS_A S-CSCF forwards PRACK to IMS_B
								S-CSCF
15					>		PRACK	IMS_B P-CSCF forwards PRACK to UE_B
16					<u> </u>		200 OK	UE_B responds PRACK with 200 OK
17				→			200 OK	IMS_B S-CSCF forwards 200 OK response to
								IMS_A S-CSCF
18			←				200 OK	IMS_A P-CSCF forwards the 200 OK response to
10					+	,		UE_A
19 20					<u> </u>		200 OK	User B answers call
20				`	-		200 OK	UE_B responds INVITE with 200 OK to indicate that the call has been answered
								une can mas been answered

Step	Direction						Message	Comment
		U	I	I	U	U		
		E A	M S	M S	E B	S		
	e r	А	A			e r		
	A		^			В		
21				\leftarrow			200 OK	IMS_B S-CSCF forwards 200 OK response to
								IMS_A S-CSCF
22			\leftarrow				200 OK	IMS_A P-CSCF forwards the 200 OK response to
								UE_A
23		\leftarrow						User A is informed that the call is in progress
24			\rightarrow				ACK	UE_A acknowledges the receipt of 200 OK for
								INVITE
25				\rightarrow			ACK	IMS_A S-CSCF forwards ACK to IMS_B S-CSCF
26					→		ACK	IMS_B P-CSCF forwards ACK to UE_B
27					\rightarrow	•		User B is informed that call is in progress
28				\rightarrow			BYE	IMS_A S-CSCF releases the call towards the called
								user with BYE
29				-	>		BYE	IMS_B P-CSCF forwards BYE to UE_B
30					\rightarrow	•		User B is informed the call has ended
31				•	\leftarrow		200 OK	UE_B sends 200 OK for BYE
32				←			200 OK	IMS_B S-CSCF forwards 200 OK response to
								IMS_A S-CSCF
33			\leftarrow				BYE	IMS_A S-CSCF releases the call towards the calling
								user with BYE
34		-						User A is informed the call has ended
35			\rightarrow				200 OK	UE_A sends 200 OK for BYE

4.4.3.2 Release from terminating network

4.4.3.2.1 Description

UE_A places an IMS VoIP call to UE_B. Once the media path is established, the session is released by the terminating network through a forced user de-registration at the HSS in IMS_B. The call flow path and node configuration for this use case corresponds to CF_MO2-SS1-MT2. We assume provisional responses (100rel) and no SDP preconditions.

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

1	User A calls User B (CFW step 1)
2	User B is informed of incoming call of User A (CFW step 8)
3	User A is informed that UE_B is ringing (CFW step 12)
4	User B answers call (CFW step 19)
5	User A is informed that the call is in progress (CFW step 23)
6	User B is informed that call is in progress (CFW step 27)
7	User A is informed the call has ended (CFW step 30)
8	User B is informed the call has ended (CFW step 34)

4.4.3.2.2 UC_09: SIP Call flow for Session release from terminating network

Step		D	Direction					Message	Comment
	U	U	I	I			U	_	
	s	E	M	M	1		s		
	e	Α	S A	S			е		
	r A		A	P	•		r B		
1	l	\rightarrow		\perp					User A calls User B
2			→					INVITE	UE_A sends INVITE with the first SDP offer
									indicating all desired medias and codecs that UE_A
									supports
3		•	\leftarrow					100 Trying	IMS_A P-CSCF responds with a 100 Trying
				_				NO OTE	provisional response
5				→				INVITE	IMS_A S-CSCF forwards INVITE to IMS_B I-CSCF
5								100 Trying	IMS_B I-CSCF responds with a 100 Trying provisional response
6					\rightarrow			INVITE	IMS_B P-CSCF forwards INVITE to UE_B
7					É			100 Trying	UE_B responds with a 100 Trying provisional
					•			100 1179	response
8						\rightarrow			User B is informed of incoming call of User A
9			T		\leftarrow			180 Ringing	UE_B responds to initial INVITE with 180 Ringing to
									indicate that it has started alerting
10				←				180 Ringing	IMS_B S-CSCF forwards 180 Ringing response to
44			_					400 D: :	IMS_A S-CSCF
11		•	←					180 Ringing	IMS_A P-CSCF forwards the 180 Ringing response to UE_A
12		-							User A is informed that UE_B is ringing
13			\rightarrow					PRACK	UE_A acknowledges the receipt of 180 response by
10								Troton	sending PRACK
14				\rightarrow				PRACK	IMS_A S-CSCF forwards PRACK to IMS_B
									S-CSCF
15					\rightarrow			PRACK	IMS_B P-CSCF forwards PRACK to UE_B
16					\leftarrow			200 OK	UE_B responds PRACK with 200 OK
17				\				200 OK	IMS_B S-CSCF forwards 200 OK response to
18		-	\leftarrow					200 OK	IMS_A S-CSCF IMS_A P-CSCF forwards the 200 OK response to
10		ľ						200 OK	UE A
19						←			User B answers call
20					\leftarrow			200 OK	UE_B responds INVITE with 200 OK to indicate that
									the call has been answered
21				←				200 OK	IMS_B S-CSCF forwards 200 OK response to
			_						IMS_A S-CSCF
22			←					200 OK	IMS_A P-CSCF forwards the 200 OK response to
23		(\dashv						UE_A User A is informed that the call is in progress
24			→					ACK	UE_A acknowledges the receipt of 200 OK for
			1					7.01.	INVITE
25			1	\rightarrow				ACK	IMS_A S-CSCF forwards ACK to IMS_B S-CSCF
26					\rightarrow			ACK	IMS_B P-CSCF forwards ACK to UE_B
27						\rightarrow			User B is informed that call is in progress
28		Ī	Ţ	+				BYE	IMS_B S-CSCF releases the call towards the calling
		_	\dashv	-				D)/E	user with BYE
29			←					BYE	IMS_A P-CSCF forwards BYE to UE_B
30 31		← .	→					200 OK	User A is informed the call has ended UE_A sends 200 OK for BYE
32				\rightarrow				200 OK 200 OK	IMS_A S-CSCF forwards 200 OK response to
02								200 010	IMS_B S-CSCF
33			\dashv		\rightarrow			BYE	IMS_B S-CSCF releases the call towards the called
						L			user with BYE
34						\rightarrow			User B is informed the call has ended
35					\leftarrow			200 OK	UE_B sends 200 OK for BYE

4.4.4 P-CSCF initiated session release

4.4.4.1 Resources missing before session establishment

4.4.4.2 Description

An internal message reports to the P-CSCF the loss of resource (e.g. radio resources). If a dialog initiation is started, but not yet established, then the P-CSCF will CANCEL the requests.

If a UE_A Originated dialog is established then the call will be released by the P-CSCF (in IMS_A). If a UE_B Originated dialog is established then the call will be released by the P-CSCF (in IMS_A). The call flow path and node configuration for this use case corresponds to CF_MO2-SS1-MT2.

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):

1	User A calls User B (CFW step 1)
2	User B is informed of incoming call of User A (CFW step 8)
3	User A is informed that UE_B is ringing (CFW step 12)
4	Internal a message that resources for UE_A are not available (CFW step 19)
5	User B is informed the call has ended (CFW step 25)

4.4.4.2.1 UC_10: SIP Call flow for Session establishment cancelled

Step	Direction						Message	Comment
	U	U	I	I	Į	J		
	s	Ε	М	M	1 E	Ε :	s	
	е	Α	S	S	E	3		
	r		Α	В	3		•	
	Α					I	3	
1		\rightarrow						User A calls User B
2							INVITE	UE_A sends INVITE with the first SDP offer
								indicating all desired medias and codecs that UE_A
								supports
3			\rightarrow				100 Trying	IMS_A P-CSCF responds with a 100 Trying
								provisional response
4				\rightarrow			INVITE	IMS_A S-CSCF forwards INVITE to IMS_B I-CSCF
5				←			100 Trying	IMS_B I-CSCF responds with a 100 Trying
								provisional response
6					\rightarrow		INVITE	IMS_B P-CSCF forwards INVITE to UE_B
7					\leftarrow		100 Trying	UE_B responds with a 100 Trying provisional
								response
8						\rightarrow		User B is informed of incoming call of User A
9					\leftarrow		180 Ringing	UE_B responds to initial INVITE with 180 Ringing to
								indicate that it has started alerting
10				←			180 Ringing	IMS_B S-CSCF forwards 180 Ringing response to
								IMS_A S-CSCF
11			\leftarrow				180 Ringing	IMS_A P-CSCF forwards the 180 Ringing response
								to UE_A
12		\leftarrow						User A is informed that UE_B is ringing
13			\rightarrow				PRACK	UE_A acknowledges the receipt of 180 response by
								sending PRACK
14				\rightarrow			PRACK	IMS_A S-CSCF forwards PRACK to IMS_B
								S-CSCF
15					\rightarrow		PRACK	IMS_B P-CSCF forwards PRACK to UE_B
16					\leftarrow		200 OK	UE_B responds PRACK with 200 OK
17				+			200 OK	IMS_B S-CSCF forwards 200 OK response to
	igspace							IMS_A S-CSCF
18		-	\leftarrow				200 OK	IMS_A P-CSCF forwards the 200 OK response to
								UE_A
19							LOSS	Internal a message that resources for UE_A are not
								available
20				\rightarrow			CANCEL	IMS_A sends CANCEL to IMS_B

Step		D	ire	cti	on			Message	Comment
	U	U	I	I	Į.	U	U		
	s	Ε	M	N	1	E	s		
	е	Α	S	S	i	В	е		
	r		Α	В	3		r		
	Α						В		
22				\downarrow				200 OK	IMS_B S-CSCF responds with a 200 OK
23					\rightarrow			CANCEL	IMS_B sends CANCEL to UE_B
24					\leftarrow			200 OK	UE_B responds with 200 OK
25						\uparrow			User B is informed the call has ended
26					\leftarrow			437 Request Terminated	UE_B S-CSCF sends 437 Request Terminated to
								·	IMS_B
27					\rightarrow			ACK	IMS_B responds with ACK
28				\leftarrow				437 Request Terminated	IMS_B sends 437 Request Terminated to IMS_A
29				\rightarrow				ACK	IMS_A responds with ACK

4.4.4.3 Resources missing on originator network within session

4.4.4.3.1 Description

If a UE_A Originated dialog is established then the call will be released by the P-CSCF (in IMS_A). The call flow path and node configuration for this use case corresponds to CF_MO2-SS1-MT2.

1	User A calls User B (CFW step 1)
2	User B is informed of incoming call of User A (CFW step 8)
3	User A is informed that UE_B is ringing (CFW step 12)
4	User B answers call (CFW step 19)
5	User A is informed that the call is in progress (CFW step 23)
6	User B is informed that call is in progress (CFW step 27)
7	PDF or SPDF sends a message that resources are missing for UE_A (CFW step 28)
8	User B is informed the call has ended (CFW step 31)

4.4.4.3.2 UC_11: SIP Call flow for Session release from originating network

Step)ire	ctic	n		Message	Comment
	U	U	I	T	U	U	3	
	s	Ē	M	M		s		
	е	Α	s	S	В	е		
	r		A			r		
	Α					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 UE_A
								supports
3			\leftarrow				100 Trying	IMS_A P-CSCF responds with a 100 Trying
								provisional response
4				\rightarrow			INVITE	IMS_A S-CSCF forwards INVITE to IMS_B I-CSCF
5				←			100 Trying	IMS_B I-CSCF responds with a 100 Trying
								provisional response
6				-	→		INVITE	IMS_B P-CSCF forwards INVITE to UE_B
7				•	1.		100 Trying	UE_B responds with a 100 Trying provisional
								response
8					\rightarrow	•		User B is informed of incoming call of User A
9				•	-		180 Ringing	UE_B responds to initial INVITE with 180 Ringing to
								indicate that it has started alerting
10				+			180 Ringing	IMS_B S-CSCF forwards 180 Ringing response to
								IMS_A S-CSCF
11			\leftarrow				180 Ringing	IMS_A P-CSCF forwards the 180 Ringing response
								to UE_A
12		\leftarrow						User A is informed that UE_B is ringing
13			\rightarrow				PRACK	UE_A acknowledges the receipt of 180 response by
								sending PRACK

Step	Direction							Message	Comment
	U	U	I	I		U	U		
	s	Ε	М	N	1		s		
	е	Α	S	S		В	е		
	r		Α	В	3		r		
	Α		<u> </u>				В		
14				\rightarrow				PRACK	IMS_A S-CSCF forwards PRACK to IMS_B
									S-CSCF
15					\uparrow			PRACK	IMS_B P-CSCF forwards PRACK to UE_B
16					\downarrow			200 OK	UE_B responds PRACK with 200 OK
17				\leftarrow				200 OK	IMS_B S-CSCF forwards 200 OK response to
									IMS_A S-CSCF
18			←					200 OK	IMS_A P-CSCF forwards the 200 OK response to
									UE_A
19						\leftarrow			User B answers call
20					\leftarrow			200 OK	UE_B responds INVITE with 200 OK to indicate that
									the call has been answered
21				\leftarrow				200 OK	IMS_B S-CSCF forwards 200 OK response to
									IMS_A S-CSCF
22			\leftarrow					200 OK	IMS_A P-CSCF forwards the 200 OK response to
									UE_A
23		-							User A is informed that the call is in progress
24			\rightarrow					ACK	UE_A acknowledges the receipt of 200 OK for
									INVITE
25				\rightarrow				ACK	IMS_A S-CSCF forwards ACK to IMS_B S-CSCF
26					\rightarrow			ACK	IMS_B P-CSCF forwards ACK to UE_B
27									User B is informed that call is in progress
28								LOSS	PDF or SPDF sends a message that resources are
									missing for UE_A
29								BYE	IMS_A P-CSCF sends BYE to IMS_B S-CSCF
30					\uparrow			BYE	IMS_B P-CSCF forwards BYE to UE_B
31									User B is informed the call has ended
32					\downarrow			200 OK	UE_B sends 200 OK for BYE
33				\leftarrow				200 OK	IMS_B forwards 200 OK response to IMS_A

4.4.4.4 Resources missing on terminating network within session

4.4.4.1 Description

If a UE_A Originated dialog is established then the call will be released by the P-CSCF (in IMS_B). If a UE_ The call flow path and node configuration for this use case corresponds to CF_MO2-SS1-MT2.

1	User A calls User B (CFW step 1)
2	User B is informed of incoming call of User A (CFW step 8)
3	User A is informed that UE_B is ringing (CFW step 12)
4	User B answers call (CFW step 19)
5	User A is informed that the call is in progress (CFW step 23)
6	User B is informed that call is in progress (CFW step 27)
7	PDF or SPDF sends a message that resources are missing for UE_B (CFW step 28)
8	User A is informed the call has ended (CFW step 31)

4.4.4.4.2 UC_12: SIP Call flow for Session release from terminating network

Step		Direction						Message	Comment
_	U	U	I	I	Į	J	U		
	s	Е	М	M	I E	Ξ	s		
	е			S	E	3	е		
	r		Α	В			r		
	Α						В		
1		\rightarrow							User A calls User B
2		1.	\rightarrow				IN	IVITE	UE_A sends INVITE with the first SDP offer
									indicating all desired medias and codecs that UE_A
									supports
3			\leftarrow				10	00 Trying	IMS_A P-CSCF responds with a 100 Trying
									provisional response
4				\rightarrow			IN	IVITE	IMS_A S-CSCF forwards INVITE to IMS_B I-CSCF
5				\leftarrow				00 Trying	IMS_B I-CSCF responds with a 100 Trying
								, 5	provisional response
6					\rightarrow		IN	IVITE	IMS_B P-CSCF forwards INVITE to UE_B
7					\leftarrow			00 Trying	UE_B responds with a 100 Trying provisional
-								, g	response
8						\rightarrow			User B is informed of incoming call of User A
9			1		←		18	80 Ringing	UE_B responds to initial INVITE with 180 Ringing to
					-		'		indicate that it has started alerting
10				←			18	30 Ringing	IMS_B S-CSCF forwards 180 Ringing response to
				`				55 7 111191119	IMS_A S-CSCF
11		١.	(18	30 Ringing	IMS_A P-CSCF forwards the 180 Ringing response
			`				'	50 ranging	to UE_A
12		+							User A is informed that UE_B is ringing
13			\rightarrow				PI	RACK	UE_A acknowledges the receipt of 180 response by
10							' '	TOTOR	sending PRACK
14				\rightarrow			PI	RACK	IMS_A S-CSCF forwards PRACK to IMS_B
							' '		S-CSCF
15					\rightarrow		PI	RACK	IMS_B P-CSCF forwards PRACK to UE_B
16					′			00 OK	UE_B responds PRACK with 200 OK
17				(`			00 OK	IMS_B S-CSCF forwards 200 OK response to
17				`			20	50 OK	IMS_A S-CSCF
18		١.	-				20	00 OK	IMS_A P-CSCF forwards the 200 OK response to
10			`				20	50 OK	UE_A
19						(User B answers call
20		-		_	-	_	20	00 OK	UE_B responds INVITE with 200 OK to indicate that
20					`		20	50 OK	the call has been answered
21				(_		20	00 OK	IMS_B S-CSCF forwards 200 OK response to
21				`			20	50 OK	IMS_A S-CSCF
22		Н.	←				20	00 OK	IMS_A P-CSCF forwards the 200 OK response to
			`				20	JO OK	UE_A
23		←							User A is informed that the call is in progress
24			\rightarrow				Λ.	CK	UE_A acknowledges the receipt of 200 OK for
24							A	ON.	INVITE
25	1	\forall	-	\rightarrow			Λ.	CK	IMS_A S-CSCF forwards ACK to IMS_B S-CSCF
26	1	\vdash	-		\rightarrow			CK CK	IMS_B P-CSCF forwards ACK to UE_B
27					<u> </u>	\rightarrow	A	OIX	User B is informed that call is in progress
						7	1.0	200	PDF or SPDF(in IMS_B) sends a message that
28							LC	OSS	
29		\dashv		←			D)	YE	resources are missing for UE_B IMS_B P-CSCF sends BYE to IMS_A S-CSCF
	-	$\vdash \vdash$	←	_				YE YE	
30		←					B	T C	IMS_A P-CSCF forwards BYE to UE_A User A is informed the call has ended
31			\leq				20	20 OK	
32	-	H	\rightarrow	\dashv				00 OK	UE_A sends 200 OK for BYE
33				\rightarrow			20	00 OK	IMS_A forwards 200 OK response to IMS_B

4.4.5 IMS message exchange between UEs in different networks

4.4.5.1 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):

1	User A sends an instant message (CFW step 1)
2	User B is informed about the instant message (CFW step 5)
3	Optional: User A is presented a delivery report (CFW step 9)

4.4.5.2 UC_13: SIP Call flow for IMS Message Exchange

Step	Direction			n		Message	Comment	
	U	J	ı	I	U	U		
	s	Ε	M	M	Ε	s		
	е	Α	S	S	В	е		
	r		Α	В		r		
	Α					В		
1		\rightarrow						User A sends an instant message
2			\rightarrow				MESSAGE	UE_A sends MESSAGE to IMS_A
3			-)			MESSAGE	IMS_A sends MESSAGE to IMS_B
4				-)		MESSAGE	IMS_B sends MESSAGE to UE_B
5					1	•		User B is informed about the instant message
6				+	-		200 OK	UE_B sends 200 OK to IMS_B
7			•	1			200 OK	IMS_B sends 200 OK to IMS_A
8			\leftarrow				200 OK	IMS_A sends 200 OK to UE_A
9		(Optional: User A is presented a delivery report

4.5 Test descriptions

This clause introduces interoperability Test Descriptions (TDs) which realize one or more IMS NNI test purposes (see TS 186 011-1[2]). TDs have been designed to cover as few test purposes as possible. However, due to the limited test execution control in interoperability testing, a number TDs cover more than one test purpose.

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. Test PReamble (PR) and POstamble (PO) steps in a test sequence only reference call flow steps in a use case. Those call flow steps which are associated with the Test Body (TB) 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.

4.5.1 General Capabilities

4.5.1.1 IMS CN components shall support SIP messages greater than 1 500 bytes

		Test description	
Identifier:	TD_IMS_0	0001	
Summary:	IMS CN co	omponents shall support SIP mess	sages greater than 1 500 bytes
Configuration:	CF_MO2-	SS1-MT2	
References	Test purp	ose	Specification reference
	TP_IMS_4	4002_01	TS 124 229 [1] (V6.13.0), clause 4.2A, ¶ 1
Use Case ref.:	UC_13		
Pre-test conditions:	UEUEUEUEUE	atic configuration as per clause 4.3 _A, UE_B support 100rel, no SDP _A, UE_B have no filter criteria de _A, UE_B IP bearers established _A configured to use TCP for mes _A registered using user_1_priv@ _B registered using user_1_priv@ _A, UE_B registered public identit	P preconditions, and TCP Ifined in HSS as per clause 4.2.1 Issage transport Itims-a.net as per clause 4.2.3 Itims-b.net as per clause 4.2.3
Test sequence:	Step		
	1 PR 2 TB	"user_1_pub@ims-b.net" (CFW s	stant message with 2 000 byte file to step 1) nessage with 2 000 byte file (CFW step
Conformance	Check		
criteria:	1	then { IMS_B receives the MES	to UE_B Body bigger than 1 500 bytes "using TCP" SAGE _Body bigger than 1 500 bytes

The expected test body call flow sequence is:

Step	Direction)		Message	Comment		
	U	U	I	I		C	U		
	s	Ε	M	N	1	Ε	s		
	е	Α	S	S	•	В	е		
	r		Α	В	3		r		
	Α						В		
1		\rightarrow							User A sends an instant message
2			→					MESSAGE	UE_A sends MESSAGE to IMS_A
3				→				MESSAGE	IMS_A sends a MESSAGE and IMS_B receives
									the MESSAGE via TCP (2 000 bytes)
4					\rightarrow			MESSAGE	IMS_B sends MESSAGE to UE_B
5						\rightarrow			User B is informed about the instant message
6					\leftarrow			200 OK	UE_B sends 200 OK to IMS_B
7				\leftarrow				200 OK	IMS_B sends 200 OK to IMS_A
8			\leftarrow					200 OK	IMS_A sends 200 OK to UE_A
9		(Optional: User A is presented a delivery report

4.5.2 Initial dialog or standalone request procedures

4.5.2.1 Standalone request procedures

4.5.2.1.1 Standalone MESSAGE request procedure

		Test description		
Identifier:	TD_IMS_0			
Summary:		ne MESSAGE request procedures	3	
Configuration:	CF_MO2-			
References	Test purp		Specification reference	
	TP_IMS_	5061_02	TS 124 229 [1] (V6.13.0), clause 5.2.6.4, ¶ 89	
	TP_IMS_	5097_06	TS 124 229 [1] (V6.13.0), clause 5.4.3.2,	
	TP_IMS_	5097_07	TS 124 229 [1] (V6.13.0), clause 5.4.3.2,	
	TP_IMS_	_	TS 124 229 [1] (V6.13.0), clause 5.4.3.3, ¶ 49	
	TP_IMS_	5118_01	TS 124 229 [1] (V6.13.0), clause 5.4.3.3, ¶ 54	
Use Case ref.:	UC_13			
Pre-test	• Sta	atic configuration as per clause 4.	3	
conditions:	• UE	_A, UE_B support 100rel, no SD	P preconditions	
	• UE	_A, UE_B have no filter criteria d	lefined in HSS	
	• UE	_A, UE_B IP bearers established	as per clause 4.2.1	
	• UE	_A registered using user_1_priv@	@ims-a.net as per clause 4.2.3	
	• UE	B registered using user_1_prive	@ims-b.net as per clause 4.2.3	
		_A, UE_B registered public ident		
			· ·	
Test sequence:	Step			
	1 PR	(CFW step 1)	stant message to "user_1_pub@ims-b.net"	
	2 TB	Verify that UE_B gets the message (CFW step 5)		
Conformance	Check			
criteria:	1	TP_IMS_5061_02 in CFW step	7 (200 OK):	
		ensure that {		
		when { UE_B sends a 2xx_resp	ponse to UE_A }	
		then { IMS_A receives the 2xx_		
		not containing P-Preferred-Identity_header and		
		containing P-Asserte		
			ess "sent in P-Called_Party-ID header of the	
		standalone request"		
		and		
		UE_A receives the 2xx_res	sponse	
		, }		
	2	TP_IMS_5097_06 in CFW step 3	3 (MESSACE):	
	 	ensure that {	o (IVILOGAGL).	
		when { UE_A sends a MESSA	GE to LIE B }	
		then { IMS_B receives the ME		
			harging-Vector_header	
			id_value_parameter	
		and	paramoto.	
		UE_B receives the MESS.	AGE }	
]}	- ,	
	1	17		

	Test description		
3	TP_IMS_5097_07 in CFW step 3 (MESSAGE):		
	ensure that {		
	when { UE_A sends MESSAGE to UE_B }		
	then { IMS_B receives the MESSAGE		
	containing a P-Charging-Vector_header		
	(containing a orig-ioi_parameter		
	indicating ioi of IMS_A and		
	not containing a access-network-charging-info_parameter)		
	and		
	not containing a P-Access-Network-Info_header		
	and		
	UE_B receives the MESSAGE }}		
4	TP_IMS_5117_02 in CFW step 7 (200 OK):		
	ensure that {		
	when { UE_B sends 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		
	and		
	not containing a P-Access-Network-Info_header and		
	UE_A receives the 2xx_response }		
	t		
5	TP_IMS_5118_01 in CFW step 7 (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 ioi of IMS_A and		
	containing a term-ioi_parameter		
	indicating ioi of IMS_B		
	and		
	UE_A receives the 200_response }		
	- ' '		

Step		D	ire	ctic	n		Message	Comment
	U	U	I	I	U	U	_	
	s	Ε	M	M	E	s		
	е	Α	S	S	В	е		
	r		Α	В		r		
	Α					В		
1		\rightarrow						User A sends an instant message
2			→				MESSAGE	UE_A sends MESSAGE to IMS_A
3			-)			MESSAGE	IMS_A sends MESSAGE to IMS_B
4				-	→		MESSAGE	IMS_B sends MESSAGE to UE_B
5)	•		User B is informed about the instant message
6				•	\leftarrow		200 OK	UE_B sends 200 OK to IMS_B
7			•	-			200 OK	IMS_B sends 200 OK to IMS_A
8			(200 OK	IMS_A sends 200 OK to UE_A
9		\leftarrow						Optional: User A is presented a delivery report

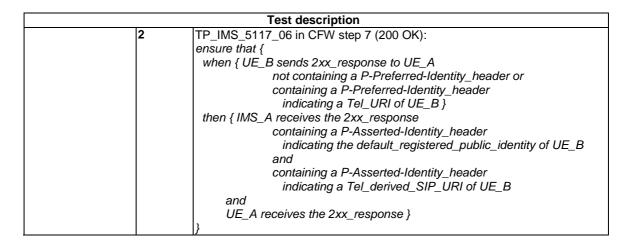
4.5.2.1.2 Standalone MESSAGE request procedure with implicit Tel URI

		Test description		
Identifier:	TD_IMS_0			
Summary:		e MESSAGE request procedures	with implicit Tel URI	
Configuration:	CF_MO2-	SS1-MT2		
References	Test purp		Specification reference	
	TP_IMS_	5097_08	TS 124 229 [1] (V6.13.0), clause 5.4.3.2,	
	TP_IMS_	5117_04	TS 124 229 [1] (V6.13.0), clause 5.4.3.3, ¶ 49	
Use Case ref.:	UC_13			
Pre-test	• Sta	atic configuration as per clause 4.3	3	
conditions:	• UE	_A, UE_B support 100rel, no SDF	P preconditions	
	• UE	_A, UE_B have no filter criteria de	efined in HSS	
	• UE	_A, UE_B IP bearers established	as per clause 4.2.1	
	• UE	_A registered using user_2_priv@	ims-a.net as per clause 4.2.3	
		_B registered using user_2_priv@		
	• UE	_A, UE_B implicitly registered pul	blic identities include SIP and Tel URIs	
		_A, UE_B default public identity is		
Test sequence:	Step			
	1 PR	UE_A is requested to send an instant message to "user_2_pub@ims-b.net"		
	2 TB	(CFW step 1) Verify that UE_B gets the mess	nage (CEW step 5)	
	ZIB	verify that OE_B gets the mess	sage (Crw step 5)	
Cantarmana	Chaola			
Conformance criteria:	Check	TD IMC 5007 00 in CEW stars 2	(MECCACE):	
criteria:	TP_IMS_5097_08 in CFW step 3 (MESSAGE):			
		ensure that {	TALLE D	
		when { UE_A sends MESSAGE	- to UE_B -Preferred-Identity_header or	
			-Freierred-Identity_header or eferred-Identity_header	
			Tel_URI for UE_A}	
		then { IMS_B receives the MES		
			serted-Identity_header	
			fault_registered_public_identity of UE_A	
		and	radit_registered_pasite_identity or el_rt	
			serted-Identity_header	
		indicating a Tel_		
		and		
		UE_B receives the MESSA	IGE }	
		}	·	
	2	TP_IMS_5117_04 in CFW step 7	7 (200 OK):	
		ensure that {		
		when { UE_B sends 2xx_respon		
			-Preferred-Identity_header or	
			eferred-Identity_header	
			Tel_URI of UE_B}	
		then { IMS_A receives the 2xx_		
			serted-Identity_header	
			fault_registered_public_identity of UE_B	
		and		
			serted-Identity_header	
		indicating a Tel_	UKI of UE_B	
		and		
		UE_A receives the 2xx_res	sponse }	
<u> </u>		<i>}</i>		

Step		D	ire	cti	on			Message	Comment
	U	U	I	I		U	U		
	s	Ε	M	IV	١	E	s		
	е	Α	S	S	;	В	е		
	r		Α	В	3		r		
	Α						В		
1		\rightarrow							User A sends an instant message
2			→					MESSAGE	UE_A sends MESSAGE to IMS_A
3				→				MESSAGE	IMS_A sends MESSAGE to IMS_B
4					\rightarrow			MESSAGE	IMS_B sends MESSAGE to UE_B
5						\rightarrow			User B is informed about the instant message
6					(200 OK	UE_B sends 200 OK to IMS_B
7				←				200 OK	IMS_B sends 200 OK to IMS_A
8			(200 OK	IMS_A sends 200 OK to UE_A
9		(Optional: User A is presented a delivery report

4.5.2.1.3 Standalone MESSAGE request procedure with implicit SIP URI

	Test desc	cription				
Identifier:	TD_IMS_0004	. I				
Summary:		e MESSAGE request procedures with implicit SIP URI				
Configuration:	CF_MO2-SS1-MT2	-				
References	Test purpose	Specification reference				
	TP_IMS_5097_09	TS 124 229 [1] (V6.13.0), clause 5.4.3.2,				
	TP_IMS_5117_06	TS 124 229 [1] (V6.13.0), clause 5.4.3.3, ¶ 49				
Use Case ref.:	UC_13	•				
Pre-test conditions:	 Static configuration as per clause 4.3 UE_A, UE_B support 100rel, no SDP preconditions UE_A, UE_B have no filter criteria defined in HSS UE_A, UE_B IP bearers established as per clause 4.2.1 UE_A registered using user_3_priv@ims-a.net as per clause 4.2.3 UE_B registered using user_3_priv@ims-b.net as per clause 4.2.3 UE_A, UE_B implicitly registered public identities include SIP and Tel URIs UE_A, UE_B default public identity is a Tel_URI 					
Test sequence:	(CFW step 1)	end an instant message to "user_3_pub@ims-b.net" the message (CFW step 5)				
Conformance criteria:	ensure that { when { UE_A sends M not containir containir indicate then { IMS_B receives containir indicate and containir	aining a P-Preferred-Identity_header or ong a P-Preferred-Identity_header or ong a P-Preferred-Identity_header or ong a P-Preferred-Identity_header or ong a P-Asserted-Identity_header or ong the default_registered_public_identity of UE_A or ong a P-Asserted-Identity_header or ong a P-Asserted-Identity_header or ong a Tel_derived_SIP_UR of UE_A I				



Step		D	ire	ctic	n		Message	Comment
	U	U	I	I	U	U		
	s	Ε	М	M	E	s		
	е	Α	S	S	В	е		
	r		Α	В		r		
	Α					В		
1		\rightarrow						User A sends an instant message
2			↑				MESSAGE	UE_A sends MESSAGE to IMS_A
3			-	→			MESSAGE	IMS_A sends MESSAGE to IMS_B
4				-)		MESSAGE	IMS_B sends MESSAGE to UE_B
5					-	>		User B is informed about the instant message
6				•	$\leftarrow \mid$		200 OK	UE_B sends 200 OK to IMS_B
7			•	←			200 OK	IMS_B sends 200 OK to IMS_A
8			-				200 OK	IMS_A sends 200 OK to UE_A
9		+						Optional: User A is presented a delivery report

4.5.2.1.4 Standalone MESSAGE request with DNS/ENUM lookup procedures

	Test descrip	tion						
Identifier:	TD_IMS_0005							
Summary:	Standalone MESSAGE request with DNS/ENUM lookup procedures							
Configuration:	CF_MO2-SS1-MT2c							
References	Test purpose Specification reference							
	TP_IMS_5097_10	TS 124 229 [1], clause 5.4.3.2, ¶ 1						
Use Case:	UC_13							
Pre-test conditions:	UE_B registered using user_5UE_A, UE_B registered public	o SDP preconditions eria defined in HSS lished as per clause 4.2.1 _priv@ims-a.net as per clause 4.2.3 _priv@ims-b.net as per clause 4.2.3 identities are SIP URIs only NS/ENUM entry mapping UE_B's E.164 number						
Test sequence:	Step 1 PR							
Conformance	Check							
criteria:	indicating then { IMS_A sends a DN containing th when { IMS_A receives D containing a indicating then { IMS_A sends the N containing a	SAGE to UE_B Request_URI a Tel_URI} IS_Query to DNS_A e Tel_URI_E.164_Number } INS_Response NAPTR_Resource_Record the SIP_URI of UE_B } MESSAGE to IMS_B Request_URI a SIP_URI						

Step		Direction			1		Message	Comment	
		Α	М	S	I M S B		U s e r B		
1	-	>							User A sends an instant message
2			→					MESSAGE	UE_A sends MESSAGE to IMS_A
3			-	>				DNS QUERY	IMS_A sends DNS QUERY to DNS, verify that the query contains an E.164 telephone URI
4			€	-				DNS RESPONSE	DNS_A sends DNS RESPONSE containing a NAPTR resource record to IMS_A
5			11,	*				MESSAGE	IMS_A sends MESSAGE to IMS_B, verify that the Request_URI of the MESSAGE indicates a SIP_URI
6				\rightarrow				MESSAGE	IMS_B sends MESSAGE to UE_B
7						\rightarrow			User B is informed about the instant message
8					+			200 OK	UE_B sends 200 OK to IMS_B
9			+	- [200 OK	IMS_B sends 200 OK to IMS_A
10		•	-	Î				200 OK	IMS_A sends 200 OK to UE_A
11	+	۲,							Optional: User A is presented a delivery report

4.5.2.2 Initial INVITE dialog procedures

4.5.2.2.1 Initial INVITE request procedure

		Test description				
Identifier:	TD_IMS_0006					
Summary:	Initial INVITE request procedures					
Configuration:	CF_MO2-	SS1-MT2				
References	Test purp	ose	Specification reference			
	TP_IMS_5	5046_01	TS 124 229 [1], clause 5.2.6.3, ¶ 4			
	TP_IMS_5	5097_01	TS 124 229 [1], clause 5.4.3.2, ¶ 1			
	TP_IMS_5	5097_02	TS 124 229 [1], clause 5.4.3.2, ¶ 1			
	TP_IMS_5	5107_02	TS 124 229 [1], clause 5.4.3.2, ¶ 49			
Use Case:	UC_01					
Pre-test conditions:	 Static configuration as per clause 4.3 UE_A, UE_B support 100rel, no SDP preconditions UE_A, UE_B have no filter criteria defined in HSS UE_A, UE_B IP bearers established as per clause 4.2.1 UE_A registered using user_1_priv@ims-a.net as per clause 4.2.3 UE_B registered using user_1_priv@ims-b.net as per clause 4.2.3 UE_A, UE_B registered public identities are SIP URIs only 					
Test sequence:	Step	Initiate on IMC ValD call on U.S.	A addressed to liveau 4 mult @ima			
	1 TB	b.net" (CFW step 1)	_A, addressed to "user_1_pub@ims-			
	2 PO	Verify that UE_B rings (CFW step	0.8)			
	3 PO	Verify that ringback is present at				
	4 PO	Answer the call at UE B (CFW st				
	5 PO	Verify that voice can be exchange	ed in both directions (CFW step 27)			
	6 PO	Release call at UE_A (CFW step				
	7 PO	Verify that call is released at UE_				

		Test description
Conformance	Check	
criteria:	1	TP_IMS_5046_01 in CFW step 4 (INVITE):
		ensure that {
		when { UE_A sends INVITE to UE_B }
		then { IMS_B receives the INVITE
		containing an additional Via header
		containing (P-CSCF_via_port_number and
		(P-CSCF-FQDN_address or
		P-CSCF-IP_address)) of IMS_A and
		containing an additional Record-Route_header
		containing (P-CSCF_port_number "where it awaits
		subsequent requests from the called party" and
		(P-CSCF-FQDN_address or P-CSCF-IP_address))
		of IMS A and
		not containing P-Preferred-Identity_header and
		containing P-Asserted-Identity_header
		containing in Asserted Identity_header
		containing An address of OL_A and containing P-Charging-Vector_header
		containing an icid_value_parameter
		and
		UE_B receives INVITE
		}
	0	}
	2	TP_IMS_5097_01 in CFW step 4 (INVITE):
		ensure that {
		when { UE_A sends an initial INVITE to UE_B }
		then { IMS_B receives the initial INVITE
		containing a P-Charging-Vector_header
		containing an icid_value_parameter
		and
		UE_B receives the INVITE }
		}
	3	TP_IMS_5097_02 in CFW step 4 (INVITE):
		ensure that {
		when { UE_A sends initial INVITE to UE_B }
		then { IMS_B receives the initial INVITE
		containing a topmost Record-Route_header
		indicating the originating S-CSCF_SIP_URI and
		containing a P-Charging-Vector_header
		(containing a orig-ioi_parameter
		indicating IMS_A and
		not containing a access-network-charging-info_parameter)
		and
		not containing a P-Access-Network-Info_header
		and
		UE_B receives the INVITE }
		3E_B 10001700 the HVVITE
	1	ĮJ

Step		С	ire	ctic	n		Message	Comment
	U s	UE	I M			U s	_	
	е	Α	S	S	В	е		
	A		Α	P		В		
1		\rightarrow						User A calls User B
2			→				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 P-CSCF responds with a 100 Trying provisional response
4				→			INVITE	IMS_A S-CSCF forwards INVITE to IMS_B I-CSCF
5				+			100 Trying	IMS_B I-CSCF responds with a 100 Trying provisional response
6				-	→		INVITE	IMS_B P-CSCF forwards INVITE to UE_B
7				•	, L		100 Trying	UE_B responds with a 100 Trying provisional response
8					\rightarrow	•		User B is informed of incoming call of User A

4.5.2.2.2 1xx provisional response to initial INVITE request procedures

-	st description					
entifier: TD_IMS_0007						
mmary: 1xx provisional response	1xx provisional response to initial INVITE request procedure					
onfiguration: CF_MO2-SS1-MT2						
ferences Test purpose	Specification reference					
TP_IMS_5055_01	TS 124 229 [1], clause 5.2.6.4, ¶ 15					
TP_IMS_5115_01	TS 124 229 [1], clause 5.4.3.3, ¶ 44					
TP_IMS_5131_01	TS 124 229 [1], clause 5.3.2.1, ¶ 44					
e Case: UC_01						
UE_A, UE_B have UE_A, UE_B IP b UE_A registered u UE_B registered u UE_A, UE_B registered u	rt 100rel, no SDP preconditions no filter criteria defined in HSS arers established as per clause 4.2.1 ing user_1_priv@ims-a.net as per clause 4.2.3 ing user_1_priv@ims-b.net as per clause 4.2.3 ered public identities are SIP URIs only					
(CFW step 1) 2 PR Verify that UE 3 TB Verify that rir 4 PO Answer the ca 5 PO Verify that voic 6 PO Release call a	VoIP call on UE_A, addressed to "user_1_pub@ims-b.net" B rings (CFW step 8) back is present at UE_A (CFW step 12) at UE_B (CFW step 19) can be exchanged in both directions (CFW step 27) UE_A (CFW step 28) breleased at UE_B (CFW step 32)					
7 PO Verify that call	released at UE_B (CFW s					

		Test description
Conformance	Check	
criteria:	1	TP_IMS_5055_01 in CFW step 10 (180 Ringing):
		ensure that {
		when { UE_B sends a 1xx_response to UE_A }
		then { IMS_A receives 1xx_response
		containing Record-Route_header
		containing the P-CSCF_port_number of IMS_B 'where it
		expects
		subsequent requests' and
		not containing comp_parameter and
		not containing P-Preferred-Identity_header and
		containing P-Asserted-Identity_header
		indicating the address "sent in P-Called_Party-ID header
		of the initial request"
		and
		UE_A receives 1xx_response
		}
		}
	2	TP_IMS_5115_01 in CFW step 10 (180 Ringing):
		ensure that {
		when { UE_B sends 1xx_response to UE_A }
		then { IMS_A receives the 1xx_response
		containing a P-Charging-Vector_header
		containing a orig-ioi_parameter
		indicating IMS_A and
		containing a term-ioi_parameter
		indicating IMS_B
		and
		UE_A receives the 1xx_response }
		}
	3	TP_IMS_5131_01 in CFW step 10 (180 Ringing):
		ensure that {
		when { UE_B sends 1xx_response to UE_A }
		then { IMS_A receives the 1xx_response
		not containing a P-Charging-Function-Addresses_header
		and
		UE_A receives the 1xx_response }
		}

Step		D	ire	cti	on			Message	Comment
	U	U	I	I	U	J	U		
	s	Ε	M	M		Ε	s		
	е	Α	S	S	E	В	е		
	r		Α	В			r		
	Α						В		
8						\uparrow			User B is informed of incoming call of User A
9					\rightarrow			180 Ringing	UE_B responds to initial INVITE with 180
									Ringing to indicate that it has started alerting
10				←				180 Ringing	IMS_B S-CSCF forwards 180 Ringing response
									to IMS_A S-CSCF
11			(180 Ringing	IMS_A P-CSCF forwards the 180 Ringing
									response to UE_A
12		(User A is informed that UE_B is ringing

4.5.2.2.3 2xx final response and ACK for initial INVITE request procedures

		Test description						
Identifier:	TD_IMS_							
Summary:	2xx final r	esponse and ACK for initial INVI	ΓE request procedures					
Configuration:	CF_MO2-	-SS1-MT2						
References	Test purp	oose	Specification reference					
	TP_IMS_	5055_02	TS 124 229 [1], clause 5.2.6.4, ¶ 15					
	TP_IMS_	5115_02	TS 124 229 [1], clause 5.4.3.3, ¶ 44					
	TP_IMS_	5131_02	TS 124 229 [1], clause 5.3.2.1, ¶ 44					
	TP_IMS_	5107_03	TS 124 229 [1], clause 5.4.3.2, ¶ 49					
Use Case:	UC_01							
Pre-test	• Sta	atic configuration as per clause 4	.3					
conditions:	• UE	_A, UE_B support 100rel, no SD	P preconditions					
	• UE	_A, UE_B have no filter criteria o	defined in HSS					
	• UE	_A, UE_B IP bearers established	d as per clause 4.2.1					
	• UE	E_A registered using user_1_priv	@ims-a.net as per clause 4.2.3					
		E_B registered using user_1_priv						
	•		<u> </u>					
Test sequence:	Step							
	1 PR	Initiate an IMS VoIP call on UE_ (CFW step 1)	A, addressed to "user_1_pub@ims-b.net"					
	2 PR	Verify that UE_B rings (CFW ste	ep 8)					
	3 PR	Verify that ringback is present a						
	4 TB	Answer the call at UE_B (CFV						
	5 PO	<u> </u>						
	6 PO	Release call at UE_A (CFW step 28)						
	7 PO	Verify that call is released at UE_B (CFW step 32)						
Conformance	Check							
Conformance criteria:	Check 1	TP_IMS_5055_02 in CFW step	21 (200 Ok):					
		ensure that {						
		ensure that { when { UE_B sends a 2xx_res	ponse to UE_A }					
		ensure that { when { UE_B sends a 2xx_res then { IMS_A receives 2xx_res	ponse to UE_A } sponse					
		ensure that { when { UE_B sends a 2xx_res then { IMS_A receives 2xx_res containing Record-Re	ponse to UE_A } sponse oute_header					
		ensure that { when { UE_B sends a 2xx_res then { IMS_A receives 2xx_res containing Record-Re containing the P-CS	ponse to UE_A } sponse oute_header SCF_port_number of IMS_B 'where it					
		ensure that { when { UE_B sends a 2xx_res then { IMS_A receives 2xx_res containing Record-Recordaining the P-CS expects subsequent requests' a	ponse to UE_A } sponse oute_header SCF_port_number of IMS_B 'where it nd					
		ensure that { when { UE_B sends a 2xx_res then { IMS_A receives 2xx_res containing Record-Re containing the P-CS expects subsequent requests' a not containing comp	ponse to UE_A } sponse oute_header SCF_port_number of IMS_B 'where it and o_parameter and					
		ensure that { when { UE_B sends a 2xx_res then { IMS_A receives 2xx_res containing Record-Re containing the P-CS expects subsequent requests' a not containing comp not containing P-Pres	ponse to UE_A } sponse oute_header SCF_port_number of IMS_B 'where it and o_parameter and ferred-Identity_header and					
		ensure that { when { UE_B sends a 2xx_res then { IMS_A receives 2xx_res	ponse to UE_A } sponse oute_header SCF_port_number of IMS_B 'where it and o_parameter and ferred-Identity_header and d-Identity_header					
		ensure that { when { UE_B sends a 2xx_resthen { IMS_A receives 2xx_rescontaining Record-Recontaining the P-CS expects subsequent requests' a not containing compant containing P-Precontaining P-Asserte indicating the addre	ponse to UE_A } sponse oute_header SCF_port_number of IMS_B 'where it and o_parameter and ferred-Identity_header and					
		ensure that { when { UE_B sends a 2xx_res then { IMS_A receives 2xx_res	ponse to UE_A } sponse oute_header SCF_port_number of IMS_B 'where it and o_parameter and ferred-Identity_header and d-Identity_header					
		ensure that { when { UE_B sends a 2xx_res then { IMS_A receives 2xx_res containing Record-Recontaining the P-CS expects subsequent requests' a not containing comp not containing P-Precontaining P-Asserte indicating the addreinitial request" and	ponse to UE_A } sponse oute_header SCF_port_number of IMS_B 'where it and o_parameter and ferred-Identity_header and d-Identity_header ss "sent in P-Called_Party-ID header of the					
		ensure that { when { UE_B sends a 2xx_res then { IMS_A receives 2xx_res	ponse to UE_A } sponse oute_header SCF_port_number of IMS_B 'where it and o_parameter and ferred-Identity_header and d-Identity_header ss "sent in P-Called_Party-ID header of the					
		ensure that { when { UE_B sends a 2xx_res then { IMS_A receives 2xx_res containing Record-Recontaining the P-CS expects subsequent requests' a not containing comp not containing P-Precontaining P-Asserte indicating the addreinitial request" and	ponse to UE_A } sponse oute_header SCF_port_number of IMS_B 'where it and o_parameter and ferred-Identity_header and d-Identity_header ss "sent in P-Called_Party-ID header of the					
		ensure that { when { UE_B sends a 2xx_res then { IMS_A receives 2xx_res	ponse to UE_A } sponse oute_header SCF_port_number of IMS_B 'where it and o_parameter and ferred-Identity_header and d-Identity_header ss "sent in P-Called_Party-ID header of the					
	1	ensure that { when { UE_B sends a 2xx_res then { IMS_A receives 2xx_res containing Record-Recontaining the P-CS expects subsequent requests' a not containing comp not containing P-Precontaining P-Asserte indicating the addreinitial request" and	ponse to UE_A } sponse oute_header SCF_port_number of IMS_B 'where it and o_parameter and ferred-Identity_header and d-Identity_header ss "sent in P-Called_Party-ID header of the					
	1	ensure that { when { UE_B sends a 2xx_restenen { IMS_A receives 2xx_rescontaining Record-Recontaining the P-CS expects subsequent requests' a not containing P-Precontaining P-Asserte indicating the addresinitial request" and	ponse to UE_A } sponse oute_header SCF_port_number of IMS_B 'where it and o_parameter and ferred-Identity_header and d-Identity_header ss "sent in P-Called_Party-ID header of the anse 21 (200 Ok): onse to UE_A }					
	1	ensure that { when { UE_B sends a 2xx_restenen { IMS_A receives 2xx_rescontaining Record-Recontaining the P-CS expects subsequent requests' a not containing P-Precontaining P-Asserte indicating the addresinitial request" and	ponse to UE_A } sponse oute_header SCF_port_number of IMS_B 'where it and o_parameter and ferred-Identity_header and d-Identity_header ss "sent in P-Called_Party-ID header of the anse 21 (200 Ok): onse to UE_A } _response					
	1	ensure that { when { UE_B sends a 2xx_resten { IMS_A receives 2xx_rescontaining Record-Recontaining the P-CS expects subsequent requests' a not containing P-Precontaining P-Asserte indicating the addresinitial request" and	ponse to UE_A } sponse oute_header SCF_port_number of IMS_B 'where it and o_parameter and ferred-Identity_header and d-Identity_header ss "sent in P-Called_Party-ID header of the anse 21 (200 Ok): onse to UE_A } _response harging-Vector_header					
	1	ensure that { when { UE_B sends a 2xx_resten { IMS_A receives 2xx_rescontaining Record-Recontaining the P-CS expects subsequent requests' a not containing P-Precontaining P-Asserte indicating the addresinitial request" and	ponse to UE_A } sponse oute_header SCF_port_number of IMS_B 'where it and o_parameter and ferred-Identity_header and d-Identity_header ss "sent in P-Called_Party-ID header of the anse 21 (200 Ok): onse to UE_A } _response harging-Vector_header rig-ioi_parameter					
	1	ensure that { when { UE_B sends a 2xx_res then { IMS_A receives 2xx_res	ponse to UE_A } sponse oute_header SCF_port_number of IMS_B 'where it and o_parameter and ferred-Identity_header and d-Identity_header ss "sent in P-Called_Party-ID header of the anse 21 (200 Ok): onse to UE_A } _response harging-Vector_header rig-ioi_parameter S_A and					
	1	ensure that { when { UE_B sends a 2xx_resten { IMS_A receives 2xx_rescontaining Record-Recontaining the P-CS expects subsequent requests' a not containing P-Precontaining P-Asserte indicating the addresinitial request" and	ponse to UE_A } sponse oute_header SCF_port_number of IMS_B 'where it and o_parameter and ferred-Identity_header and d-Identity_header ss "sent in P-Called_Party-ID header of the anse 21 (200 Ok): onse to UE_A } _response harging-Vector_header rig-ioi_parameter S_A and am-ioi_parameter					
	1	ensure that { when { UE_B sends a 2xx_resten { IMS_A receives 2xx_rescontaining Record-Recontaining the P-CS expects subsequent requests' a not containing P-Precontaining P-Asserte indicating the addresinitial request" and	ponse to UE_A } sponse oute_header SCF_port_number of IMS_B 'where it and o_parameter and ferred-Identity_header and d-Identity_header ss "sent in P-Called_Party-ID header of the anse 21 (200 Ok): onse to UE_A } _response harging-Vector_header rig-ioi_parameter S_A and am-ioi_parameter					
	1	ensure that { when { UE_B sends a 2xx_resten { IMS_A receives 2xx_rescontaining Record-Recontaining the P-CS expects subsequent requests' a not containing P-Precontaining P-Asserte indicating the addresinitial request" and	ponse to UE_A } sponse oute_header SCF_port_number of IMS_B 'where it and o_parameter and ferred-Identity_header and d-Identity_header ss "sent in P-Called_Party-ID header of the anse 21 (200 Ok): onse to UE_A } _response harging-Vector_header rig-ioi_parameter S_A and am-ioi_parameter S_B					
	1	ensure that { when { UE_B sends a 2xx_resten { IMS_A receives 2xx_rescontaining Record-Recontaining the P-CS expects subsequent requests' a not containing P-Precontaining P-Asserte indicating the addresinitial request" and	ponse to UE_A } sponse oute_header SCF_port_number of IMS_B 'where it and o_parameter and ferred-Identity_header and d-Identity_header ss "sent in P-Called_Party-ID header of the anse 21 (200 Ok): onse to UE_A } _response harging-Vector_header rig-ioi_parameter S_A and am-ioi_parameter S_B					

```
Test description
          TP_IMS_5131_02 in CFW step 21 (200 Ok):
          ensure that {
           when { UE_B sends 2xx_response to UE_A }
           then { IMS_A receives the 2xx_response
                    not containing a P-Charging-Function-Addresses_header
               UE_A receives the 2xx_response }
          TP_IMS_5107_03 in CFW step 25 (ACK):
4
          ensure that {
           when { UE_A sends ACK to UE_B }
           then { IMS_B receives the ACK
                      ( containing a P-Charging-Vector_header
                         not containing a access-network-charging-info_parameter
                       not containing a P-Charging-Vector_header )
                      and
                       not containing a P-Access-Network-Info_header
               and
               UE_B receives the ACK }
```

Step	Direction			Message	Comment				
	U	U	ΤŤ	Ťī	Ī	U	U	· y -	
	s	Ē	М	M	ı	U E	s		
	е	Α	S	S	: lı		е		
	r		Α				r		
	Α						В		
12		←							User A is informed that UE_B is ringing
13			\rightarrow					PRACK	UE_A acknowledges the receipt of 180 response by
									sending PRACK
14				\rightarrow				PRACK	IMS_A S-CSCF forwards PRACK to IMS_B
									S-CSCF
15					\rightarrow			PRACK	IMS_B P-CSCF forwards PRACK to UE_B
16					\leftarrow			200 OK	UE_B responds PRACK with 200 OK
17				\leftarrow				200 OK	IMS_B S-CSCF forwards 200 OK response to
									IMS_A S-CSCF
18			\leftarrow					200 OK	IMS_A P-CSCF forwards the 200 OK response to
									UE_A
19						\downarrow			User B answers call
20					(200 OK	UE_B responds INVITE with 200 OK to indicate
									that the call has been answered
21				←				200 OK	IMS_B S-CSCF forwards 200 OK response to
									IMS_A S-CSCF
22			←					200 OK	IMS_A P-CSCF forwards the 200 OK response to
									UE_A
23		\leftarrow							User A is presented that call in process
24			\rightarrow					ACK	UE_A acknowledges the receipt of 200 OK for
									INVITE
25				\rightarrow				ACK	IMS_A S-CSCF forwards ACK to IMS_B S-CSCF
26					\rightarrow			ACK	IMS_B P-CSCF forwards ACK to UE_B
27						→			User B is informed that the call is in progress

4.5.2.2.4 Initial INVITE request procedure with implicit Tel URI

		Test description				
Identifier:	TD_IMS_	0009				
Summary:	Initial INVITE request procedure with implicit Tel URI					
Configuration:	CF_MO2-SS1-MT2					
References	Test purpose Specification reference					
	TP_IMS_	5097_03	TS 124 229 [1], clause 5.4.3.2, ¶ 1			
Use Case:	UC_01					
Pre-test conditions:	 UE UE UE UE UE UE 	atic configuration as per clause 4.3. A, UE_B support 100rel, no SDF A, UE_B have no filter criteria de A, UE_B IP bearers established A registered using user_2_prive B registered using user_2_prive A, UE_B implicitly registered pul A, UE_B default public identity is	P preconditions efined in HSS I as per clause 4.2.1 ims-a.net as per clause 4.2.3 ims-b.net as per clause 4.2.3 blic identities include SIP and Tel URIs			
Test sequence:	Step 1 TB 2 PO 3 PO 4 PO 5 PO 6 PO 7 PO	b.net" (CFW step 1) Verify that UE_B rings (CFW ste Verify that ringback is present at Answer the call at UE_B (CFW s	UE_A (CFW step 12) step 19) ged in both directions (CFW step 27) o 28)			
Conformance criteria:	Check 1	containing a P-Pre not indicating a then { IMS_B receives the initia containing a P-Ass indicating the de and	TE to UE_B P-Preferred-Identity_header or eferred-Identity_header Tel_URI} II INVITE serted-Identity_header efault_registered_public_identity of UE_A serted-Identity_header LURI of UE_A			

Step		D	ire	ctic	n		Message	Comment
	U s e r A	U E A	M S A	I M S B	U E B	U s e r B		
1		\rightarrow						User A calls User B
2			→				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 P-CSCF responds with a 100 Trying provisional response
4				→			INVITE	IMS_A S-CSCF forwards INVITE to IMS_B I-CSCF
5				+			100 Trying	IMS_B I-CSCF responds with a 100 Trying provisional response
6				-	>		INVITE	IMS_B P-CSCF forwards INVITE to UE_B
7				•	, L		100 Trying	UE_B responds with a 100 Trying provisional response
8					\rightarrow	•		User B is informed of incoming call of User A

4.5.2.2.5 1xx provisional response to initial INVITE request procedures with implicit Tel URI

		Test descri	otion				
Identifier:	TD_IMS_	0010					
Summary:	1xx provis	sional response to initial IN	/ITE request procedures with implicit Tel URI				
Configuration:	CF_MO2-SS1-MT2						
References	Test purpose Specification reference						
	TP_IMS_5115_03 TS 124 229 [1], clause 5.4.3.3, ¶ 44						
Use Case:	UC_01						
Pre-test	• St	atic configuration as per cla	use 4.3				
conditions:	• UE	A, UE_B support 100rel,	no SDP preconditions				
		A, UE_B have no filter cri					
		, E_A, UE_B IP bearers estal					
			2_priv@ims-a.net as per clause 4.2.3				
			2_priv@ims-b.net as per clause 4.2.3				
			red public identities include SIP and Tel URIs				
		_A, UE_B default public id					
		,					
Test sequence:	Step						
	1 PR	Initiate an IMS VoIP call o	n UE_A, addressed to "user_2_pub@ims-b.net"				
	1	(CFW step 1)					
	2 PR	Verify that UE_B rings (CF	FW step 8)				
	3 TB		resent at UE_A (CFW step 12)				
	4 PO	Answer the call at UE_B (
	5 PO		schanged in both directions (CFW step 27)				
	6 PO	Release call at UE_A (CF					
	7 PO	Verify that call is released					
	<u> </u>	Tomy that our is released	<u> </u>				
Conformance	Check						
criteria:	1	TP_IMS_5115_03 in CFW	/ step 10 (180 Ringing):				
	1	ensure that {	100 To (100 Timight)				
		when { UE_B sends 1xx	response to UE A				
			ing a P-Preferred-Identity_header or				
		containing a	a P-Preferred-Identity_header				
		indicating	a SIP_URI}				
		then { IMS_A receives th	ne 1xx_response				
		containing a	a P-Asserted-Identity_header				
		indicating	the default_registered_public_identity of UE_B				
		and					
			a P-Asserted-Identity_header				
			a Tel_URI of UE_B				
		and					
		UE_A receives the	txx_response }				
		<u>}</u>					

Step		D	ire	cti	ior)		Message	Comment
	U	U	I		l	U	U	-	
	s	Ε	M	Ν	Λ	Ε	s		
	е	Α	S	5	3	В	е		
	r		Α	E	3		r		
	Α						В		
8						1			User B is informed of incoming call of User A
9					\leftarrow			180 Ringing	UE_B responds to initial INVITE with 180
									Ringing to indicate that it has started alerting
10				(180 Ringing	IMS_B S-CSCF forwards 180 Ringing response
									to IMS_A S-CSCF
11			(180 Ringing	IMS_A P-CSCF forwards the 180 Ringing
									response to UE_A
12		+							User A is informed that UE_B is ringing

4.5.2.2.6 2xx final response to initial INVITE request procedures with implicit Tel URI

		Test description				
Identifier:	TD_IMS_0011					
Summary:	2xx final response to initial INVITE request procedures with implicit Tel URI					
Configuration:	CF_MO2-SS1-MT2					
References	Test purpose Specification reference					
	TP_IMS_	5115_04	TS 124 229 [1], clause 5.4.3.3, ¶ 44			
Use Case:	UC_01					
Pre-test conditions:	 Static configuration as per clause 4.3 UE_A, UE_B support 100rel, no SDP preconditions UE_A, UE_B have no filter criteria defined in HSS UE_A, UE_B IP bearers established as per clause 4.2.1 UE_A registered using user_2_priv@ims-a.net as per clause 4.2.3 UE_B registered using user_2_priv@ims-b.net as per clause 4.2.3 UE_A, UE_B implicitly registered public identities include SIP and Tel URIs UE_A, UE_B default public identity is a SIP_URI 					
Test sequence:	2 PR 3 PR 4 TB 5 PO 6 PO 7 PO	(CFW step 1) Verify that UE_B rings (CFW ste Verify that ringback is present at Answer the call at UE_B (CFW	UE_A (CFW step 1é) step 19) ged in both directions (CFW step 27) 28)			
criteria:	Check 1	containing a P-Pro not indicating a then { IMS_A receives the 2xx_ containing a P-As indicating the de and	Inse to UE_A P-Preferred-Identity_header or eferred-Identity_header Tel_URI} _response serted-Identity_header efault_registered_public_identity of UE_B serted-Identity_header _URI of UE_B			

Step		D	ire	ct	ior	1		Message	Comment
	U	U	I		1	U	U		
	s	Ε	M	N	И	Ε	s		
	е	Α	S	5	3	В	е		
	r		Α	E	3		r		
	Α						В		
19						+			User B answers call
20					←			200 OK	UE_B responds INVITE with 200 OK to indicate
									that the call has been answered
21				(200 OK	IMS_B S-CSCF forwards 200 OK response to
									IMS_A S-CSCF
22			←					200 OK	IMS_A P-CSCF forwards the 200 OK response to
									UE_A
23		+							User A is presented that call in process

4.5.2.2.7 Initial INVITE request procedure with implicit SIP URI

		Test description				
Identifier:	TD_IMS_0	012				
Summary:	Initial INV	Initial INVITE request procedure with implicit SIP URI				
Configuration:	CF_MO2-SS1-MT2					
References	Test purpose Specification reference					
	TP_IMS_5		TS 124 229 [1], clause 5.4.3.2, ¶ 1			
Use Case:	UC_01					
	_					
Pre-test conditions:	UEUEUEUEUEUE	atic configuration as per clause 4.3 _A, UE_B support 100rel, no SDF _A, UE_B have no filter criteria de _A, UE_B IP bearers established _A registered using user_3_priv@ _B registered using user_3_priv@ _A, UE_B implicitly registered pul _A, UE_B default public identity is	P preconditions efined in HSS as per clause 4.2.1 image: image in the second s			
Test sequence:	Step					
	1 TB 2 PO	Initiate an IMS VoIP call on UE_A, addressed to UE_B's TEL URI (CFW step 1) Verify that UE_B rings (CFW step 8)				
	3 PO	Verify that ringback is present at				
	4 PO	Answer the call at UE_B (CFW step 19)				
	5 PO	Verify that voice can be exchanged in both directions (CFW step 27) Release call at UE_A (CFW step 28)				
	6 PO					
	7 PO	Verify that call is released at UE_	_B (CFW step 32)			
Conformance	Check					
criteria:	1	containing a P-Pre indicating a Tel_ then { IMS_B receives the initia containing a P-Ass indicating the de and containing a P-Ass	TE to UE_B -Preferred-Identity_header or eferred-Identity_header URI } I INVITE serted-Identity_header efault_registered_public_identity of UE_A serted-Identity_header derived_SIP_URI of UE_A			

	U s e r A	U E A	M S A	M S B	U E B	U s e r B		
1		\rightarrow						User A calls User B
2			→				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 P-CSCF responds with a 100 Trying provisional response
4				→			INVITE	IMS_A S-CSCF forwards INVITE to IMS_B I-CSCF
5				+			100 Trying	IMS_B I-CSCF responds with a 100 Trying provisional response
6				-	>		INVITE	IMS_B P-CSCF forwards INVITE to UE_B
7				+	-		100 Trying	UE_B responds with a 100 Trying provisional response
8					\rightarrow			User B is informed of incoming call of User A

4.5.2.2.8 1xx provisional response to initial INVITE request procedures with implicit SIP URI

		Test description	
Identifier:	TD_IMS_		
Summary:			equest procedures with implicit SIP URI
Configuration:	CF_MO2-	SS1-MT2	
References	Test purp	oose	Specification reference
	TP_IMS_	5115_05	TS 124 229 [1], clause 5.4.3.3, ¶ 44
Use Case:	UC_01		
Pre-test conditions:	UEUEUEUEUEUE	atic configuration as per clause 4. _A, UE_B support 100rel, no SD _A, UE_B have no filter criteria d _A, UE_B IP bearers established _A registered using user_3_priv(_B registered using user_3_priv(_A, UE_B implicitly registered pu _A, UE_B default public identity	P preconditions defined in HSS d as per clause 4.2.1 @ims-a.net as per clause 4.2.3 @ims-b.net as per clause 4.2.3 ublic identities include SIP and Tel URIs
Test sequence:	2 PR 3 TB 4 PO 5 PO 6 PO 7 PO	(CFW step 1) Verify that UE_B rings (CFW step 1) Verify that ringback is present 1 Answer the call at UE_B (CFW step 2)	step 19) ged in both directions (CFW step 27) p 28)
Conformance criteria:	Check 1	containing a P-Pr indicating a Tel_ then { IMS_A receives the 1xx_ containing a P-As indicating the de and containing a P-As	onse to UE_A P-Preferred-Identity_header or referred-Identity_header _URI } _response sserted-Identity_header refault_registered_public_identity of UE_B _derived_SIP_URI

	U s e r A	U E A	I M S A	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 UE_A supports
3			←				100 Trying	IMS_A P-CSCF responds with a 100 Trying provisional response
4				\rightarrow			INVITE	IMS_A S-CSCF forwards INVITE to IMS_B I-CSCF
5				←			100 Trying	IMS_B I-CSCF responds with a 100 Trying provisional response
6				-)		INVITE	IMS_B P-CSCF forwards INVITE to UE_B
7				•			100 Trying	UE_B responds with a 100 Trying provisional response
8					1.	>		User B is informed of incoming call of User A
9				•			180 Ringing	UE_B responds to initial INVITE with 180 Ringing to indicate that it has started alerting
10				←			180 Ringing	IMS_B S-CSCF forwards 180 Ringing response to IMS_A S-CSCF
11			(180 Ringing	IMS_A P-CSCF forwards the 180 Ringing response to UE_A
12		+						User A is informed that UE_B is ringing

4.5.2.2.9 2xx final response to initial INVITE request procedures with implicit SIP URI

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		Test description	
Identifier:	TD_IMS_0	0014	
Summary:	2xx final re	esponse to initial INVITE request	procedures with implicit SIP URI
Configuration:	CF_MO2-	SS1-MT2	
References	Test purp	ose	Specification reference
	TP_IMS_5		TS 124 229 [1], clause 5.4.3.3, ¶ 44
Use Case:	UC_01		• •
	_		
Pre-test conditions:	UEUEUEUEUEUE	atic configuration as per clause 4.3 _A, UE_B support 100rel, no SDF _A, UE_B have no filter criteria de _A, UE_B IP bearers established _A registered using user_3_priv@ _B registered using user_3_priv@ _A, UE_B implicitly registered pul _A, UE_B default public identity is	P preconditions efined in HSS as per clause 4.2.1 Dims-a.net as per clause 4.2.3 Dims-b.net as per clause 4.2.3 blic identities include SIP and Tel URIs
Test sequence:	2 PR 3 PR 4 TB 5 PO 6 PO 7 PO	step 1) Verify that UE_B rings (CFW stell Verify that ringback is present at Answer the call at UE_B (CFW)	UE_A (CFW step 12) step 19) ed in both directions (CFW step 27) 28)
Conformance	Check		
criteria:	1	containing a P-Pre indicating a Tel_ then { IMS_A receives the 2xx_ containing a P-Ass indicating the de and containing a P-Ass	nse to UE_A -Preferred-Identity_header or eferred-Identity_header URI } response serted-Identity_header efault_registered_public_identity of UE_B serted-Identity_header derived_SIP_URI of UE_B

	U s e r A	U E A	M S A	I M S B	U E B	U s e r B		
12		+						User A is informed that UE_B is ringing
13)				PRACK	UE_A acknowledges the receipt of 180 response by sending PRACK
14			-	→			PRACK	IMS_A S-CSCF forwards PRACK to IMS_B S-CSCF
15				-	>		PRACK	IMS_B P-CSCF forwards PRACK to UE_B
16				€	-		200 OK	UE_B responds PRACK with 200 OK
17			•	+			200 OK	IMS_B S-CSCF forwards 200 OK response to IMS_A S-CSCF
18		1	+				200 OK	IMS_A P-CSCF forwards the 200 OK response to UE_A
19					←			User B answers call

4.5.2.2.10 Initial INVITE request with DNS/ENUM lookup procedures

		Test description			
Identifier:	TD_IMS				
Summary:		VITE request with DNS/ENUM lookup procedures			
Configuration:		2-SS1-MT2c			
References	Test pur				
	TP_IMS_	_5097_05 TS 124 229 [1], clause 5.4.3.2, ¶ 1			
Use Case:	UC_01				
Pre-test conditions:	• U • U • U • U • U	Static configuration as per clause 4.3 JE_A, UE_B support 100rel, no SDP preconditions JE_A, UE_B have no filter criteria defined in HSS JE_A, UE_B IP bearers established as per clause 4.2.1 JE_A registered using user_1_priv@ims-a.net as per clause 4.2.3 JE_B registered using user_5_priv@ims-b.net as per clause 4.2.3 JE_A, UE_B registered public identities are SIP URIs only DNS_B is configured with a DNS/ENUM entry mapping UE_B's E.164 number D "user_5_pub@ims-b.net"			
Test sequence:	Step				
	1 TB	Initiate an IMS VoIP call on UE_A, addressed to the E.164 number configured in DNS_B (CFW step 1) (CFW step 1)			
	2 TB	Verify that UE_B rings (CFW step 8)			
	3 PO	Verify that ringback is present at UE_A (CFW step 12)			
	4 PO	Answer the call at UE_B (CFW step 19)			
	5 PO	Verify that voice can be exchanged in both directions (CFW step 27)			
	6 PO	Release call at UE_A (CFW step 28)			
	7 PO	Verify that call is released at UE_B (CFW step 32)			
	<u> </u>				
Conformance	Check				
criteria:	1	TP_IMS_5097_05 in CFW step 4 (INVITE):			
		ensure that {			
		when { UE_A sends initial INVITE to UE_B			
		containing a Request_URI			
		indicating a Tel_URI} then { IMS_A sends a DNS_Query to DNS_A			
		containing the Tel_URL_E.164_Number }			
		when { IMS_A receives DNS_Response			
		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 a SIP_URI			
		and			
l	ı				
		UE_B receives the INVITE }			

Step		Direction			Message	Comment			
	U s e r A		M	D N S A	S	В	s		
1		\rightarrow							User A calls User B
2			→					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 P-CSCF responds with a 100 Trying provisional response
4				→				DNS QUERY	IMS_A sends DNS QUERY to DNS_A containing a E.164 telephone URI
5				+				DNS RESPONSE	DNS_A send a DNS RESPONSE to IMS_A containing a NAPTR resource record
6				\rightarrow				INVITE	IMS_A S-CSCF forwards INVITE to IMS_B I-CSCF
7				+				100 Trying	IMS_B I-CSCF responds with a 100 Trying provisional response
10						\rightarrow		INVITE	IMS_B P-CSCF forwards INVITE to UE_B
11						+		100 Trying	UE_B responds with a 100 Trying provisional response
12							\rightarrow		User B is informed of incoming call of User A

4.5.2.3 Special case of initial INVITE dialog procedures

4.5.2.3.1 P-CSCF initiated session release, session establishment cancelled

		Test descrip	otion				
Identifier:	TD_IMS_0	0016					
Summary:			ssion establishment cancelled, resources no				
	longer available						
Configuration:	CF_MO2-SS1-MT2						
References	Test purp		Specification reference				
	TP_IMS_5		TS 124 229 [1] clause 5.2.8.1.1, ¶ 1				
Use Case:	UC_10 (C	FW for Cancelled)					
Pre-test		atic configuration as per cla					
conditions:	• UE	_A, UE_B support 100rel, r	no SDP preconditions				
	• UE	_A, UE_B have no filter crit	eria defined in HSS				
	• UE	_A, UE_B IP bearers estab	lished as per clause 4.2.1				
	• UE	_A registered using user_1	_priv@ims-a.net as per clause 4.2.3				
	• UE	B registered using user_1	_priv@ims-b.net as per clause 4.2.3				
	• UE	_A, UE_B registered public	identities are SIP URIs only				
	• P-0	CSCF can receive notification	ons of UE_A network access failures				
Test sequence:	Step						
	1 PR	Initiate on IMS ValD call or	n UE_A, addressed to "user_1_pub@ims-b.net"				
	1 1 1		TOL_71, dedicased to daci_1_pub@iiiia b.iict				
		(CFW step 1)	_ · ·				
	2 PR	(CFW step 1) Verify that UE_B rings (CF	W step 8)				
	2 PR 3 PR	(CFW step 1) Verify that UE_B rings (CF) Verify that ringback is pres	W step 8) ent at UE_A (CFW step 12)				
	2 PR 3 PR 4 TB	(CFW step 1) Verify that UE_B rings (CF) Verify that ringback is pres Remove cable, antenna of	W step 8) ent at UE_A (CFW step 12) or battery from UE_A (CFW step 19)				
	2 PR 3 PR	(CFW step 1) Verify that UE_B rings (CF) Verify that ringback is pres	W step 8) ent at UE_A (CFW step 12) or battery from UE_A (CFW step 19)				
	2 PR 3 PR 4 TB 5 TB	(CFW step 1) Verify that UE_B rings (CF) Verify that ringback is pres Remove cable, antenna of	W step 8) ent at UE_A (CFW step 12) or battery from UE_A (CFW step 19)				
Conformance	2 PR 3 PR 4 TB	(CFW step 1) Verify that UE_B rings (CF Verify that ringback is pres Remove cable, antenna of Verify that call is ended a	W step 8) ent at UE_A (CFW step 12) or battery from UE_A (CFW step 19) at UE_B (CFW step 25)				
Conformance criteria:	2 PR 3 PR 4 TB 5 TB	(CFW step 1) Verify that UE_B rings (CF Verify that ringback is pres Remove cable, antenna of Verify that call is ended a TP_IMS_5072_01 in CFW	W step 8) ent at UE_A (CFW step 12) or battery from UE_A (CFW step 19) at UE_B (CFW step 25)				
	2 PR 3 PR 4 TB 5 TB	(CFW step 1) Verify that UE_B rings (CFV verify that ringback is presented and the step of	W step 8) ent at UE_A (CFW step 12) or battery from UE_A (CFW step 19) at UE_B (CFW step 25) step 20 (CANCEL):				
	2 PR 3 PR 4 TB 5 TB	(CFW step 1) Verify that UE_B rings (CFV verify that ringback is present that ringback is present that call is ended at the color of th	W step 8) ent at UE_A (CFW step 12) or battery from UE_A (CFW step 19) at UE_B (CFW step 25) step 20 (CANCEL): an indication that UE_A is no longer available" }				
	2 PR 3 PR 4 TB 5 TB	(CFW step 1) Verify that UE_B rings (CFV verify that ringback is president of the proof of the p	W step 8) ent at UE_A (CFW step 12) or battery from UE_A (CFW step 19) at UE_B (CFW step 25) step 20 (CANCEL): an indication that UE_A is no longer available" } NCEL to IMS_B and				
	2 PR 3 PR 4 TB 5 TB	(CFW step 1) Verify that UE_B rings (CFV verify that ringback is pressed and the state of the st	W step 8) ent at UE_A (CFW step 12) or battery from UE_A (CFW step 19) at UE_B (CFW step 25) step 20 (CANCEL): an indication that UE_A is no longer available" } NCEL to IMS_B and				
	2 PR 3 PR 4 TB 5 TB	(CFW step 1) Verify that UE_B rings (CFV verify that ringback is president of the proof of the p	W step 8) ent at UE_A (CFW step 12) or battery from UE_A (CFW step 19) at UE_B (CFW step 25) step 20 (CANCEL): an indication that UE_A is no longer available" } NCEL to IMS_B and				

The expected test body call flow is:

Step		Direction			n		Message	Comment
-	U s e r A	U E A	M S A	I M S B	U E B	U s e r B		
19							LOSS	Internal a message that resources for UE_A are not available
20)			CANCEL	IMS_A sends CANCEL to IMS_B
22				\leftarrow			200 OK	IMS_B S-CSCF responds with a 200 OK
23				-	>		CANCEL	IMS_B sends CANCEL to UE_B
24				-	-		200 OK	UE_B responds with 200 OK
25					\rightarrow			User B is informed the call has ended

4.5.2.3.2 P-CSCF initiated session release, session released from originating network

		Test description				
Identifier:	TD_IMS_					
Summary:	P-CSCF-i	initiated session release, session i	eleased from originating network			
Configuration:		-SS1-MT2				
References	Test purp	oose	Specification reference			
	TP_IMS_		TS 124 229 [1], clause 5.2.8.1.2, ¶ 1			
Use Case:		FW for originating network)				
		,				
Pre-test	• Sta	atic configuration as per clause 4.	3			
conditions:		E_A, UE_B support 100rel, no SDI				
		E_A, UE_B have no filter criteria d				
		E_A, UE_B IP bearers established				
		E_A registered using user_1_priv@				
		=_/\registered using user_1_priv@ =_B registered using user_1_priv@				
		E_A, UE_B registered public identi				
		CSCF can receive notifications of				
	F-	CSCF can receive notifications of	OE_A Hetwork access failules			
Test sequence:	Step					
rest sequence.	1 PR	Initiate an IMS VelD call on LIE	A, addressed "user_1_pub@ims-b.net"			
	I F K	(CFW step 1)	A, addressed dser_r_pub@iiris-b.net			
	2 PR	Verify that UE_B rings (CFW ste	n 8)			
	3 PR	Verify that ringback is present at				
	4 PR	Answer the call at UE_B (CFW s				
	5 PR		ed in both directions (CFW step 27)			
	6 TB	Remove cable, antenna or batt				
	םו טן	inclinate cable, aliternia di batt				
	7 TB	Verify that call is released at U				
Conformance	7 TB					
Conformance	7 TB Check	Verify that call is released at U	E_B (CFW step 31)			
Conformance criteria:	7 TB	Verify that call is released at U TP_IMS_5073_01 in CFW step 2	E_B (CFW step 31)			
	7 TB Check	Verify that call is released at U TP_IMS_5073_01 in CFW step 2 ensure that {	E_B (CFW step 31) 29 (BYE):			
	7 TB Check	TP_IMS_5073_01 in CFW step 2 ensure that { when { UE_A is no_longer_ava}	E_B (CFW step 31) 29 (BYE): ilable }			
	7 TB Check	TP_IMS_5073_01 in CFW step 2 ensure that { when { UE_A is no_longer_ava then { IMS_B receives BYE from	E_B (CFW step 31) 29 (BYE): ilable } m IMS_A			
	7 TB Check	TP_IMS_5073_01 in CFW step 2 ensure that { when { UE_A is no_longer_ava then { IMS_B receives BYE from containing Request_L	E_B (CFW step 31) 29 (BYE): ilable } m IMS_A IRI			
	7 TB Check	TP_IMS_5073_01 in CFW step 2 ensure that { when { UE_A is no_longer_ava then { IMS_B receives BYE from containing Request_L indicating the Contains.}	E_B (CFW step 31) 29 (BYE): ilable } m IMS_A IRI ct_header_value of UE_B and			
	7 TB Check	TP_IMS_5073_01 in CFW step 2 ensure that { when { UE_A is no_longer_ava then { IMS_B receives BYE from containing Request_U indicating the Containing To_header	E_B (CFW step 31) 29 (BYE): ilable } m IMS_A IRI ct_header_value of UE_B and			
	7 TB Check	TP_IMS_5073_01 in CFW step 2 ensure that { when { UE_A is no_longer_ava then { IMS_B receives BYE from containing Request_U indicating the Containing To_header indicating the initial in the containing the containing the initial in the containing the initial in the containing the containin	E_B (CFW step 31) 29 (BYE): ilable } in IMS_A IRI ct_header_value of UE_B and 200_OK_To_header_value from UE_B			
	7 TB Check	TP_IMS_5073_01 in CFW step 2 ensure that { when { UE_A is no_longer_ava then { IMS_B receives BYE from containing Request_L indicating the Containing To_header indicating the initial containing From_head	E_B (CFW step 31) 29 (BYE): ilable } in IMS_A IRI ct_header_value of UE_B and 200_OK_To_header_value from UE_B der			
	7 TB Check	TP_IMS_5073_01 in CFW step 2 ensure that { when { UE_A is no_longer_ava then { IMS_B receives BYE from containing Request_L indicating the Containing To_header indicating the initial containing From_head	E_B (CFW step 31) 29 (BYE): ilable } in IMS_A IRI ct_header_value of UE_B and 200_OK_To_header_value from UE_B			
	7 TB Check	TP_IMS_5073_01 in CFW step 2 ensure that { when { UE_A is no_longer_ava then { IMS_B receives BYE from containing Request_U indicating the Containing To_header indicating the initial containing From_head indicating the initial and containing Call-ID_header containing Call-ID_	E_B (CFW step 31) 29 (BYE): ilable } in IMS_A IRI ct_header_value of UE_B and 200_OK_To_header_value from UE_B der INVITE_From_header_value from UE_A ader			
	7 TB Check	TP_IMS_5073_01 in CFW step 2 ensure that { when { UE_A is no_longer_ava then { IMS_B receives BYE from containing Request_U indicating the Containing To_header indicating the initial containing From_head indicating the initial and containing Call-ID_header containing Call-ID_	E_B (CFW step 31) 29 (BYE): ilable } in IMS_A IRI ct_header_value of UE_B and 200_OK_To_header_value from UE_B der INVITE_From_header_value from UE_A			
	7 TB Check	TP_IMS_5073_01 in CFW step 2 ensure that { when { UE_A is no_longer_ava then { IMS_B receives BYE from containing Request_U indicating the Containing To_header indicating the initial containing From_head indicating the initial and containing Call-ID_header containing Call-ID_	E_B (CFW step 31) 29 (BYE): ilable } in IMS_A IRI ct_header_value of UE_B and 200_OK_To_header_value from UE_B der INVITE_From_header_value from UE_A ader			
	7 TB Check	TP_IMS_5073_01 in CFW step 2 ensure that { when { UE_A is no_longer_ava then { IMS_B receives BYE from containing Request_D indicating the Containing To_header indicating the initial containing From_head indicating the initial and containing Call-ID_he indicating the initial and containing CSeq_head	E_B (CFW step 31) 29 (BYE): ilable } m IMS_A IRI ct_header_value of UE_B and 200_OK_To_header_value from UE_B der INVITE_From_header_value from UE_A ader INVITE_Call_Id_header_value from UE_A der			
	7 TB Check	TP_IMS_5073_01 in CFW step 2 ensure that { when { UE_A is no_longer_ava then { IMS_B receives BYE from containing Request_D indicating the Containing To_header indicating the initial containing From_head indicating the initial and containing Call-ID_he indicating the initial and containing CSeq_head indicating an incremental i	E_B (CFW step 31) 29 (BYE): ilable } m IMS_A IRI ct_header_value of UE_B and 200_OK_To_header_value from UE_B der INVITE_From_header_value from UE_A ader INVITE_Call_Id_header_value from UE_A der ented Sequence_Number and			
	7 TB Check	TP_IMS_5073_01 in CFW step 2 ensure that { when { UE_A is no_longer_ava then { IMS_B receives BYE from containing Request_U indicating the Containing To_header indicating the initial containing From_head indicating the initial and containing Call-ID_he indicating the initial and containing CSeq_head indicating an increment containing Route_head containing Route_head indicating Route_head indicating Route_head indicating Route_head indicating In CFW step 2 when the containing Route_head indicating an increment containing Route_head indicating Ro	E_B (CFW step 31) 29 (BYE): ilable } m IMS_A IRI ct_header_value of UE_B and 200_OK_To_header_value from UE_B der INVITE_From_header_value from UE_A adder INVITE_Call_Id_header_value from UE_A der eented Sequence_Number and der			
	7 TB Check	TP_IMS_5073_01 in CFW step 2 ensure that { when { UE_A is no_longer_ava then { IMS_B receives BYE from containing Request_U indicating the Containing To_header indicating the initial containing From_head indicating the initial and containing Call-ID_he indicating the initial and containing CSeq_head indicating an increms containing Route_head indicating 'dialog spirite in the containing Containing Containing Containing Route_head indicating 'dialog spirite in the containing '	E_B (CFW step 31) 29 (BYE): ilable } m IMS_A IRI ct_header_value of UE_B and 200_OK_To_header_value from UE_B der INVITE_From_header_value from UE_A adder INVITE_Call_Id_header_value from UE_A der bented Sequence_Number and ider ecific routing information for UE_B' and			
	7 TB Check	TP_IMS_5073_01 in CFW step 2 ensure that { when { UE_A is no_longer_ava then { IMS_B receives BYE from containing Request_L indicating the Containing To_header indicating the initial containing From_header indicating the initial and containing Call-ID_he indicating the initial and containing CSeq_header indicating and increment containing Route_header indicating 'dialog sperifurther headers base	E_B (CFW step 31) 29 (BYE): ilable } m IMS_A IRI ct_header_value of UE_B and 200_OK_To_header_value from UE_B der INVITE_From_header_value from UE_A adder INVITE_Call_Id_header_value from UE_A der eented Sequence_Number and der			
	7 TB Check	TP_IMS_5073_01 in CFW step 2 ensure that { when { UE_A is no_longer_ava then { IMS_B receives BYE from containing Request_U indicating the Containing To_header indicating the initial containing From_header indicating the initial and containing Call-ID_he indicating the initial and containing CSeq_header indicating and increment containing Route_header indicating 'dialog spowd 'further headers base and'	E_B (CFW step 31) 29 (BYE): ilable } m IMS_A IRI ct_header_value of UE_B and 200_OK_To_header_value from UE_B der INVITE_From_header_value from UE_A adder INVITE_Call_Id_header_value from UE_A der bented Sequence_Number and ider ecific routing information for UE_B' and			
	7 TB Check	TP_IMS_5073_01 in CFW step 2 ensure that { when { UE_A is no_longer_ava then { IMS_B receives BYE from containing Request_L indicating the Containing To_header indicating the initial containing From_header indicating the initial and containing Call-ID_he indicating the initial and containing CSeq_header indicating and increment containing Route_header indicating 'dialog sperifurther headers base	E_B (CFW step 31) 29 (BYE): ilable } m IMS_A IRI ct_header_value of UE_B and 200_OK_To_header_value from UE_B der INVITE_From_header_value from UE_A adder INVITE_Call_Id_header_value from UE_A der bented Sequence_Number and ider ecific routing information for UE_B' and			
	7 TB Check	TP_IMS_5073_01 in CFW step 2 ensure that { when { UE_A is no_longer_ava then { IMS_B receives BYE from containing Request_U indicating the Containing To_header indicating the initial containing From_header indicating the initial and containing Call-ID_he indicating the initial and containing CSeq_header indicating and increment containing Route_header indicating 'dialog spowd 'further headers base and'	E_B (CFW step 31) 29 (BYE): ilable } m IMS_A IRI ct_header_value of UE_B and 200_OK_To_header_value from UE_B der INVITE_From_header_value from UE_A adder INVITE_Call_Id_header_value from UE_A der bented Sequence_Number and ider ecific routing information for UE_B' and			

The expected test body call flow is:

Step	Direction			n		Message	Comment	
-	U s e r A	U E A	I M S A	I M S B	U E B	U s e r B		
28					•		LOSS	PDF or SPDF sends a message that resources are missing for UE_A
29			-	>			BYE	IMS_A P-CSCF sends BYE to IMS_B S-CSCF
30					>		BYE	IMS_B P-CSCF forwards BYE to UE_B
31)	>		User B is informed the call has ended

4.5.2.3.3 P-CSCF initiated session release, session released from terminating network

		Test description				
Identifier:	TD_IMS_0018					
Summary:		ession release, session released from terminating network				
Configuration:	CF_MO2-SS1-MT2					
References	Test purpose	Specification reference				
	TP_IMS_5074_01	TS 124 229 [1], clause 5.2.8.1.2, ¶ 10				
Use Case:	UC_12 (CFW for te	rminating network)				
Pre-test conditions:	 UE_A, UE_E UE_A, UE_E UE_A regist UE_B regist UE_A, UE_E 	uration as per clause 4.3 3 support 100rel, no SDP preconditions 3 have no filter criteria defined in HSS 3 IP bearers established as per clause 4.2.1 ered using user_1_priv@ims-a.net as per clause 4.2.3 ered using user_1_priv@ims-b.net as per clause 4.2.3 3 registered public identities are SIP URIs only a receive notifications of UE_B network access failures				
Test sequence:	(CFW st					
		at UE_B rings (CFW step 8)				
		at ringback is present at UE_A (CFW step 12) he call at UE_B (CFW step 19)				
		at voice can be exchanged in both directions (CFW step 27)				
		cable, antenna or battery from UE_B (CFW step 28)				
		reaction of battery from GE_B (GFW step 20)				
	7 ID Verily ti	lat call is released at OL_A (OI W step 31)				
Conformance	Check					
criteria:	TP_IMS_ ensure ti when { then { I.	UE_B is no_longer_available } MS_A receives BYE from IMS_B containing Request_URI indicating the Contact_header_value of UE_A and containing To_header indicating the initial INVITE_To_header_value from UE_A containing From_header indicating the initial 200_OK_From_header_value from UE_B and containing Call-ID_header indicating the initial INVITE_Call_Id_header_value from UE_A and containing CSeq_header indicating an incremented Sequence_Number and containing Route_header indicating 'dialog specific routing information for UE_A' and "further headers based on local policy or call release reason"				

Step	Direction			n		Message	Comment	
-	U s e r A	U E A	M S A	M S B	U E B	U s e r B		
28		1					LOSS	PDF or SPDF(in IMS_B) sends a message that resources are missing for UE_B
29				←			BYE	IMS_B P-CSCF sends BYE to IMS_A S-CSCF
30			←				BYE	IMS_A P-CSCF forwards BYE to UE_A
31		\leftarrow						User A is informed the call has ended

4.5.2.3.4 Initial request to non-existent user procedures

		Test description			
Identifier:	TD_IMS_0	0019			
Summary:	Initial INVI	ITE request to non-existent user procedures			
Configuration:	CF_MO2-				
References	Test purp	ose	Specification reference		
	TP_IMS_5	5132_01	TS 124 229 [1], clause 5.3.2.1, ¶ 32		
Use Case:	UC_05				
Pre-test conditions:	UEUEUEUEUE	tic configuration as per clause 4.3 _A support 100rel, no SDP precoi _A have no filter criteria defined ir _A IP bearers established as per _A registered using user_1_priv@ _A registered public identities are	nditions n HSS clause 4.2.1 Dims-a.net as per clause 4.2.3		
Test sequence:	1 PR 2 TB	Initiate an IMS VoIP call on UE_A sip:non_existent_user@ims-b.ne Verify that an error is received step 6)	,		
Conformance	Check				
criteria:	1	TP_IMS_5132_01 in CFW step 6 ensure that { when { UE_A sends INVITE	URI ting_user in IMS_B} TE response or a 604_response)		

Step		D	ire	ctio	n		Message	Comment
	U s e r A	U E A	I M S A	M S B	U E B	U s e r B		
1		\rightarrow						User A calls User B
2			→				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 P-CSCF responds with a 100 Trying provisional response
4			,	→			INVITE	IMS_A S-CSCF forwards INVITE to IMS_B I-CSCF
5				←			100 Trying	IMS_B I-CSCF responds with a 100 Trying provisional response
6			,	←			404 Not Found or 604 Does not exist anywhere	IMS_B I-CSCF generates error message indicating non-existent user
7		,	+				404 Not Found or 604 Does not exist anywhere	IMS_A P-CSCF forwards error response to UE_A
8		\leftarrow						User A is informed of "no such user"

4.5.2.3.5 Initial request to non-registered user with no filter criterion

		Test description		
Identifier:	TD_IMS_0	0020		
Summary:	Initial request to non-registered user with no filter criterion			
Configuration:	CF_MO2-	SS1-MT2b		
References	Test purp	ose	Specification reference	
	TP_IMS_5	5133_01	TS 124 229 [1], clause 5.3.2.1, ¶ 33	
Use Case:	UC_03			
Pre-test conditions:	 Static configuration as per clause 4.3 UE_A, UE_B support 100rel, no SDP preconditions UE_A, UE_B have no filter criteria defined in HSS UE_A, UE_B IP bearers established as per clause 4.2.1 UE_A registered using user_1_priv@ims-a.net as per clause 4.2.3 UE_B not registered as user_1_priv@ims-b.net UE_A registered public identities are SIP URIs only 		P preconditions Pfined in HSS as per clause 4.2.1 Pims-a.net as per clause 4.2.3 Pims-b.net	
Test sequence:	Step 1 TB	(CFW step 1)	_A, addressed to "user_1_pub@ims-b.net"	
	2 TB Verify that error is received and call is aborted at UE_A (CFW step 8)			
Conformance	Check			
criteria:	1	TP_IMS_5133_01 in CFW step 6 ensure that { when { UE_A sends INVITE to U then { IMS_B receives the INVIT sends a 480_resp and UE_A receives the 480_res }	JE_B } TE and onse to IMS_A	

Step		D	ire	ctio	n		Message	Comment
	U s e r A		I M S A	I M S B	U E B	U s e r B		
1		\rightarrow						User A calls User B
2		•)				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 P-CSCF responds with a 100 Trying provisional response
4			-	→			INVITE	IMS_A S-CSCF forwards INVITE to IMS_B I-CSCF
5			•	+			100 Trying	IMS_B I-CSCF responds with a 100 Trying provisional response
6			•	⊢			480 Temporarily unavailable	IMS_B I-CSCF generates error message indicating unavailable user
7		•	←				480 Temporarily unavailable	IMS_A P-CSCF forwards error response to UE_A
8		+						User A is informed of User B unreachable

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

		Test description	
Identifier:	TD_IMS_0	0021	
Summary:	Initial requ	uest to non-registered user with terminating unregistered filter criterion	
Configuration:	CF_MO2-	SS1-MT2-AST4b	
References	Test purp	ose	Specification reference
	TP_IMS_	5109_01	TS 124 229 [1], clause 5.4.3.3, ¶ 35
Use Case:	UC_04		1 1 1
Pre-test conditions:	 UE IM: SE AS UE UE UE 	atic configuration as per clause 4 E_A, UE_B support 100rel, no SE E_A has no filter criteria defined in S_B has terminating unregistered ESSION_TERMINATED option and E_B is unreachable from IMS_B E_A, UE_B IP bearers established E_A registered using user_1_priv E_B not registered as user_4_priv E_A registered public identities and	P preconditions In HSS Id criterion set for UE_B on INVITE indicating Indicating of forward the INVITE to AS_B Id as per clause 4.2.1 Indicating of the indi
Test sequence:	Step 1 PR 2 TB	(CFW step 1)	_A, addressed to "user_4_pub@ims-b.net" nd call is aborted at UE_A (CFW step 6
	<u> </u>		
Conformance	Check		
criteria:	1	TP_IMS_5109_01 in CFW step ensure that { when { UE_A sends INVITE to then { IMS_B receives the INV sends (a 408_responsand UE_A receives the respon}	UE_B } ITE and e or a 5xx_response) to IMS_A

Step		D	ire	ctio	n		Message	Comment
	U s e r A	U E A	I M S A	I M S B	U E B	U s e r B		
1		\rightarrow						User A calls User B
2			→				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 P-CSCF responds with a 100 Trying provisional response
4				→			INVITE	IMS_A S-CSCF forwards INVITE to IMS_B I-CSCF
5			1	+			100 Trying	IMS_B I-CSCF responds with a 100 Trying provisional response
6			•	+			408 Request Timeout or 5xx Response	IMS_B I-CSCF forwards S-CSCF error message indicating unreachable AS
7			←				408 Request Timeout or 5xx Response	IMS_A P-CSCF forwards error response to UE_A
8		\leftarrow						User A is informed of "not reachable"

4.5.2.3.7 S-CSCF initiated session release from originating network

		Test description		
Identifier:	TD_IMS_			
Summary:	S-CSCF-	nitiated release of established session from originating network		
Configuration:		-SS1-MT2	J V	
References	Test pur		Specification reference	
	TP_IMS_	5139 01	TS 124 229 [1], clause 5.4.5.1.2, ¶ 1	
Use Case:		CFW for originating network)		
Pre-test	• St	atic configuration as per clause 4.3		
conditions:		E_A, UE_B support 100rel, no SDP	preconditions	
		E_A, UE_B have no filter criteria del		
		E_A, UE_B IP bearers established a		
		=_A registered using user_1_priv@		
		E_B registered using user_1_priv@		
	• UE	E_A, UE_B registered public identiti	es are SIP ORIS Only	
Test sequence:	Step			
rest sequence.	1 PR	Initiate on IMS ValD call on LIE A	, addressed to "user_1_pub@ims-b.net"	
	IPK	(CFW step 1)	, addressed to "user_1_pub@ims-b.net	
	2 PR	Verify that UE_B rings (CFW step	0/	
	3 PR			
	4 PR	Verify that ringback is present at UE_A (CFW step 12) Answer the call at UE_B (CFW step 19)		
	5 PR	Verify that voice can be exchanged in both directions (CFW step 27) Set UE_A registration status to de-registered in IMS_A HSS		
	6 TB		de-registered in IMS_A HSS	
	7 TB	(CFW step 28)	(CEW stan 20)	
		Verify that call is ended at UE_E		
	8 PO	Verify that call is ended at UE_A (CFVV step 34)	
	9 PO	Verify that UE_A is deregistered		
Cantarmanas	Chask			
Conformance	Check	TD IMC 5400 04 in CEW step 20	2 (DVC).	
criteria:	1	TP_IMS_5139_01 in CFW step 28	B (BYE):	
		ensure that {		
		ensure that { when { IMS_A receives 'an indica	ation that UE_A is to be de-registered' }	
		ensure that { when { IMS_A receives 'an indicathen { IMS_A sends a BYE to IM	ation that UE_A is to be de-registered' } S_B	
		ensure that { when { IMS_A receives 'an indicate then { IMS_A sends a BYE to IM containing Request_UF	ation that UE_A is to be de-registered' } 'S_B RI	
		ensure that { when { IMS_A receives 'an indicate then { IMS_A sends a BYE to IM containing Request_UF indicating the initial 2	ation that UE_A is to be de-registered' } S_B	
		ensure that { when { IMS_A receives 'an indicathen { IMS_A sends a BYE to IM containing Request_UF indicating the initial 2 and	ation that UE_A is to be de-registered' } 'S_B RI	
		ensure that { when { IMS_A receives 'an indicathen { IMS_A sends a BYE to IM containing Request_UF indicating the initial 2 and containing To_header	ation that UE_A is to be de-registered' } S_B RI 00_OK_Contact_value sent by IMS_B	
		ensure that { when { IMS_A receives 'an indicathen { IMS_A sends a BYE to IM containing Request_UF indicating the initial 2 and containing To_header indicating the initial 2	ation that UE_A is to be de-registered' } S_B RI 00_OK_Contact_value sent by IMS_B 00_OK_To_value sent by IMS_B and	
		ensure that { when { IMS_A receives 'an indicathen { IMS_A sends a BYE to IMCONTAINT CONTAINT CONTAIN	ation that UE_A is to be de-registered' } IS_B RI 00_OK_Contact_value sent by IMS_B 00_OK_To_value sent by IMS_B and er	
		ensure that { when { IMS_A receives 'an indicathen { IMS_A sends a BYE to IM containing Request_UF indicating the initial 2 and containing To_header indicating the initial 2 containing From_heade indicating the initial IN	ation that UE_A is to be de-registered' } S_B RI 00_OK_Contact_value sent by IMS_B 00_OK_To_value sent by IMS_B and er NVITE_From_value sent by IMS_A and	
		ensure that { when { IMS_A receives 'an indicathen { IMS_A sends a BYE to IM containing Request_UF indicating the initial 2 and containing To_header indicating the initial 2 containing From_header indicating the initial IN containing Call-ID_header	ation that UE_A is to be de-registered' } IS_B RI 00_OK_Contact_value sent by IMS_B 00_OK_To_value sent by IMS_B and er INVITE_From_value sent by IMS_A and der	
		ensure that { when { IMS_A receives 'an indicathen { IMS_A sends a BYE to IM containing Request_UF indicating the initial 2 and containing To_header indicating the initial 2 containing From_header indicating the initial IN containing Call-ID_headindicating the initial IN containing the initial IN conta	ation that UE_A is to be de-registered' } IS_B RI 00_OK_Contact_value sent by IMS_B 00_OK_To_value sent by IMS_B and er INVITE_From_value sent by IMS_A and der INVITE_Call_Id_value sent by IMS_A and	
		ensure that { when { IMS_A receives 'an indicathen { IMS_A sends a BYE to IM containing Request_UF indicating the initial 2 and containing To_header indicating the initial 2 containing From_header indicating the initial IN containing Call-ID_header indicating the initial IN containing CSeq_head.	ation that UE_A is to be de-registered' } IS_B RI 00_OK_Contact_value sent by IMS_B 00_OK_To_value sent by IMS_B and er INVITE_From_value sent by IMS_A and der INVITE_Call_Id_value sent by IMS_A and er	
		ensure that { when { IMS_A receives 'an indicathen { IMS_A sends a BYE to IM containing Request_UF indicating the initial 2 and containing To_header indicating the initial 2 containing From_header indicating the initial IN containing Call-ID_header indicating the initial IN containing CSeq_header indicating the initial IN containing CSeq_header indicating the initial IN containing the initial IN contain	ation that UE_A is to be de-registered' } IS_B RI 00_OK_Contact_value sent by IMS_B 00_OK_To_value sent by IMS_B and er INVITE_From_value sent by IMS_A and der INVITE_Call_Id_value sent by IMS_A and er INVITE_Cseq_value sent by IMS_A	
		ensure that { when { IMS_A receives 'an indicathen { IMS_A sends a BYE to IM containing Request_UF indicating the initial 2 and containing To_header indicating the initial 2 containing From_header indicating the initial IN containing Call-ID_header indicating the initial IN containing CSeq_head.	ation that UE_A is to be de-registered' } IS_B RI 00_OK_Contact_value sent by IMS_B 00_OK_To_value sent by IMS_B and er IVITE_From_value sent by IMS_A and der IVITE_Call_Id_value sent by IMS_A and er IVITE_Cseq_value sent by IMS_A	
		ensure that { when { IMS_A receives 'an indicathen { IMS_A sends a BYE to IM containing Request_UF indicating the initial 2 and containing To_header indicating the initial 2 containing From_header indicating the initial IF containing Call-ID_header indicating the initial IF containing CSeq_header indicating the initial IF containing CSeq_header indicating the initial IF containing Route_header containing Route_header containing Route_header indicating Route_header containing Rout	ation that UE_A is to be de-registered' } IS_B RI 00_OK_Contact_value sent by IMS_B 00_OK_To_value sent by IMS_B and er IVITE_From_value sent by IMS_A and der IVITE_Call_Id_value sent by IMS_A and er IVITE_Cseq_value sent by IMS_A	
		ensure that { when { IMS_A receives 'an indicathen { IMS_A sends a BYE to IM containing Request_UF indicating the initial 2 and containing To_header indicating the initial 2 containing From_header indicating the initial IF containing Call-ID_header indicating the initial IF containing CSeq_header indicating the initial IF containing CSeq_header indicating the initial IF incremented by 1 and containing Route_header indicating "dialog specification" dialog specification in the initial IF containing Route_header indicating "dialog specification" dialog specification in the initial IF containing Route_header indicating "dialog specification" dialog specification in the initial IF containing Route_header indicating "dialog specification" dialog specification in the initial IF containing Route_header indicating "dialog specification" dialog specification in the initial IF containing Route_header indicating "dialog specification" dialog specification in the initial IF containing Route_header indicating Route_header indi	ation that UE_A is to be de-registered' } IS_B RI 00_OK_Contact_value sent by IMS_B 00_OK_To_value sent by IMS_B and er INVITE_From_value sent by IMS_A and der INVITE_Call_Id_value sent by IMS_A and er INVITE_Cseq_value sent by IMS_A	
		ensure that { when { IMS_A receives 'an indicathen { IMS_A sends a BYE to IM containing Request_UF indicating the initial 2 and containing To_header indicating the initial 2 containing From_header indicating the initial IF containing Call-ID_header indicating the initial IF containing CSeq_header indicating the initial IF containing CSeq_header indicating the initial IF incremented by 1 and containing Route_header indicating "dialog specification" dialog specification in the initial IF containing Route_header indicating "dialog specification" dialog specification in the initial IF containing Route_header indicating "dialog specification" dialog specification in the initial IF containing Route_header indicating "dialog specification" dialog specification in the initial IF containing Route_header indicating "dialog specification" dialog specification in the initial IF containing Route_header indicating "dialog specification" dialog specification in the initial IF containing Route_header indicating Route_header indi	ation that UE_A is to be de-registered' } IS_B RI 00_OK_Contact_value sent by IMS_B 00_OK_To_value sent by IMS_B and er IVITE_From_value sent by IMS_A and der IVITE_Call_Id_value sent by IMS_A and er IVITE_Cseq_value sent by IMS_A Ider Ider Icific routing information for UE_B" and	
		ensure that { when { IMS_A receives 'an indicate then { IMS_A sends a BYE to IM containing Request_UF indicating the initial 2 and containing To_header indicating the initial 2 containing From_header indicating the initial IN containing Call-ID_header indicating the initial IN containing CSeq_header indicating the initial IN containing the initial IN containing the initial IN incremented by 1 and containing Route_header indicating "dialog specifurther headers based"	ation that UE_A is to be de-registered' } IS_B RI 00_OK_Contact_value sent by IMS_B 00_OK_To_value sent by IMS_B and er IVITE_From_value sent by IMS_A and der IVITE_Call_Id_value sent by IMS_A and er IVITE_Cseq_value sent by IMS_A Ider Ider Icific routing information for UE_B" and	
		ensure that { when { IMS_A receives 'an indicathen { IMS_A sends a BYE to IM containing Request_UF indicating the initial 2 and containing To_header indicating the initial 2 containing From_heade indicating the initial IN containing Call-ID_header indicating the initial IN containing CSeq_header indicating the initial IN containing CSeq_header indicating the initial IN incremented by 1 and containing Route_header indicating "dialog spee" further headers based and	ation that UE_A is to be de-registered' } IS_B RI 00_OK_Contact_value sent by IMS_B 00_OK_To_value sent by IMS_B and er IVITE_From_value sent by IMS_A and der IVITE_Call_Id_value sent by IMS_A and er IVITE_Cseq_value sent by IMS_A Ider Ider Icific routing information for UE_B" and	

The expected TB call flow is:

Step		D	ire	ctic	on			Message	Comment
	U	U	I	I	Ų		U	-	
	s	Ε	М	M			s		
	е	Α	S	S	E	3	е		
	r		Α	В			r		
	Α						В		
27						\rightarrow			User B is informed that call is in progress
28			-	→				BYE	IMS_A S-CSCF releases the call towards the
									called user with BYE
29					→			BYE	IMS_B P-CSCF forwards BYE to UE_B
30						\rightarrow			User B is informed the call has ended
31					\leftarrow			200 OK	UE_B sends 200 OK for BYE
32			•	\perp				200 OK	IMS_B S-CSCF forwards 200 OK response to
									IMS_A S-CSCF
33		•	\leftarrow					BYE	IMS_A S-CSCF releases the call towards the calling
									user with BYE
34		\leftarrow							User A is informed the call has ended
35			\rightarrow					200 OK	UE_A sends 200 OK for BYE

4.5.2.3.8 S-CSCF initiated session release from terminating network

		Test description		
Identifier:	TD_IMS_	0023		
Summary:	S-CSCF-i	nitiated release of established ses	sion from terminating network	
Configuration:	CF_MO2-	SS1-MT2	-	
References	Test purp	ose	Specification reference	
	TP_IMS_		TS 124 229 [1], clause 5.4.5.1.2, ¶ 1	
Use Case:	UC_09 (C	FW for terminating network)		
Pre-test	• Sta	atic configuration as per clause 4.3	3	
conditions:		_A, UE_B support 100rel, no SDF		
	• UE	_A, UE_B have no filter criteria de	efined in HSS	
	• UE	_A, UE_B IP bearers established	as per clause 4.2.1	
	• UE	_A registered using user_1_priv@	ims-a.net as per clause 4.2.3	
	• UE	_B registered using user_1_priv@	ims-b.net as per clause 4.2.3	
	• UE	_A, UE_B registered public identi	ties are SIP URIs only	
Test sequence:	Step			
	1 PR		A, addressed to "user_1_pub@ims-b.net"	
		(CFW step 1)		
	2 PR	Verify that UE_B rings (CFW step 8)		
	3 PR	Verify that ringback is present at UE_A (CFW step 12)		
	4 PR	Answer the call at UE_B (CFW step 19) Verify that voice can be exchanged in both directions (CFW step 27)		
	5 PR			
	6 TB	Set UE_B registration status to de-registered in IMS_B HSS (CFW step 28)		
	7 TB	(CFW step 28)	A (CEW stan 20)	
	8 PO	Verify that call is ended at UE_ Verify that call is ended at UE_B		
	9 PO	Verify that UE_B is deregistered	(Crvv step 34)	
	910	Verify that OL_B is deregistered		
Conformance	Check			
criteria:	1	TP_IMS_5139_02 in CFW step 2	28 (BYF):	
		ensure that {	(= : =).	
			cation that UE_B is no_longer_available' }	
		then { IMS_B sends a BYE to IM		
		containing Request_U		
		_	INVITE_Contact_value sent by IMS_A	
		and		
		containing To_header		
		containing From_head	INVITE_From_value sent by IMS_A and	
			200_OK_To_value sent by IMS_B and	
		containing Call-ID_hea		
			INVITE_Call_Id_value sent by IMS_A and	
		containing CSeg_head		
			_value of the last request sent by IMS_B	
		incremented by 1 ar	nd .	
		containing Route_hea		
			ecific routing information for UE_A" and	
		_	d on local policy or call release reason"	
		and		
		UE_A receives BYE		
		, ,		
	1	17		

The expected TB call flow is:

Step		D	ire	ctio	n		Message	Comment
	U	U	I	I	U	U	_	
	s	Ε	M	M		s		
	е	Α	S	S	В	е		
	r		Α	В		r		
	Α					В		
27					\rightarrow	•		User B is informed that call is in progress
28				←			BYE	IMS_B S-CSCF releases the call towards the
								calling user with BYE
29			→				BYE	IMS_A P-CSCF forwards BYE to UE_B
30		\downarrow						User A is informed the call has ended
31			↑				200 OK	UE_A sends 200 OK for BYE
32				\rightarrow			200 OK	IMS_A S-CSCF forwards 200 OK response to
								IMS_B S-CSCF
33				-	>		BYE	IMS_B S-CSCF releases the call towards the called
								user with BYE
34					7			User B is informed the call has ended
35				•	1.		200 OK	UE_B sends 200 OK for BYE

4.5.3 Subsequent requests within dialog procedures

4.5.3.1 Subsequent UPDATE target refresh request procedures

		Test description				
Identifier:	TD_IMS_0	0024				
Summary:	Subseque	nt UPDATE target refresh requests and 200 OK response procedures				
Configuration:	CF_MO2-	SS1-MT2				
References	Test purp		Specification reference			
	TP_IMS_5	5048_02	TS 124 229 [1], clause 5.2.6.3, ¶ 26			
	TP_IMS_5	5058_02	TS 124 229 [1], clause 5.2.6.4, ¶ 67			
	TP_IMS_5		TS 124 229 [1], clause 5.4.3.2, ¶ 42			
Use Case:	UC_06 (C	FW for UPDATE)				
Pre-test	• Sta	atic configuration as per clause 4.3	3			
conditions:	• UE	_A, UE_B support 100rel, no SDF	P preconditions			
	• UE	_A, UE_B have no filter criteria de	efined in HSS			
	• UE	_A, UE_B IP bearers established	as per clause 4.2.1			
	• UE	_A registered using user_1_priv@	ims-a.net as per clause 4.2.3			
	• UE	UE_B registered using user_1_priv@ims-b.net as per clause 4.2.3				
	UE_A, UE_B registered public identities are SIP URIs only					
	• UE	 UE_A, UE_B support UPDATE method for call hold/resume 				
Test sequence:	Step					
	1 PR		A, addressed to "user_1_pub@ims-b.net"			
		(CFW step 1)				
	2 PR	Verify that UE_B rings (CFW step				
	3 PR	Verify that ringback is present at				
	4 PR	Answer the call at UE_B (CFW st				
	5 PR		ed in both directions (CFW step 27)			
	6 TB	Place call on hold at UE_A (CF				
	7 TB		be exchanged in both directions			
		(CFW step 32)	20)			
	8 TB	Resume call at UE_A (CFW ste	p 36)			
	9 TB	Verify that voice can be exchanged in both directions (CFW step 44)				
	10 PO	Release call at UE_A (CFW step				
	11 PO	Verify that call is released at UE_	_B (CFW step 49)			
			, , , , , , , , , , , , , , , , , , , ,			

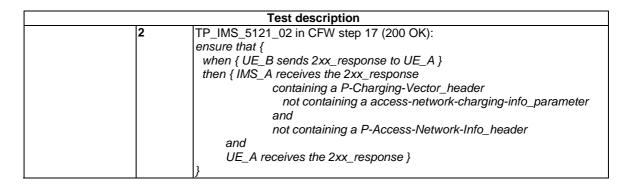
		Test description
Conformance	Check	
criteria:	1	TP_IMS_5048_02 in CFW step 30 and 38 (UPDATE):
		ensure that {
		when { UE_A sends UPDATE to UE_B }
		then { IMS_B receives the UPDATE
		containing an additional Via_header
		containing (P-CSCF_port_number 'where it awaits the
		responses to arrive' and
		(P-CSCF-FQDN_address or
		P-CSCF-IP_address)) of IMS_A and
		containing an additional topmost Record-Route_header
		containing (P-CSCF_port_number "where it awaits subsequent
		requests from the called party" and
		(P-CSCF-FQDN_address or
		P-CSCF-IP_address)) of IMS_A
		and
		UE_B receives UPDATE
		}
		}
		TP_IMS_5058_02 in CFW step 34 and 42 (200 Ok):
		ensure that {
		when { UE_B sends a 2xx_response to UE_A }
		then { IMS_A receives 2xx_response
		containing Record-Route_header
		containing the same P-CSCF_port_number of IMS_B "as in the
		response to the previous initial request" and
		not containing a comp_parameter
		and
		UE_A receives 2xx_response
		}
		}
		TP_IMS_5106_02 in CFW step 30 and 38 (UPDATE):
		ensure that {
		when { UE_A sends subsequent UPDATE to UE_B }
		then { IMS_B receives the subsequent UPDATE
		containing a topmost Record-Route_header
		containing the S-CSCF_SIP_URI of IMS_A and
		containing a P-Charging-Vector_header
		not containing a access-network-charging-info_parameter
		and
		not containing a P-Access-Network-Info_header
		and
		UE_B receives the UPDATE }
]}

Step		D	ire	ctio	on		Message	Comment
	U	U	I	Π	U	L		
	s	Ε		M				
	е	Α	S	S	В	е		
	r		Α	В		r		
	Α					В		
28		\rightarrow						User A put call on hold
29			→				UPDATE	UE_A sends UPDATE message indicating media
								stream inactive (Call Hold)
30			ŀ	→			UPDATE	IMS_A S-CSCF forwards UPDATE to IMS_B
								S-CSCF
31					→		UPDATE	IMS_B P-CSCF forwards UPDATE to UE_B
32					-	>		User B is informed that call on hold
33					←		200 OK	UE_B responds to UPDATE with 200 OK
								indicating media stream inactive
34			Ī	←			200 OK	IMS_B S-CSCF forwards 200 OK response to
								IMS_A S-CSCF
35			←				200 OK	IMS_A P-CSCF forwards the 200 OK response to
								UE_A

Step			Dire	cti	on			Message	Comment
	U	U	I	I		U	U	<u> </u>	
	s	Ε	М	N	ı	E	s		
	е	Α	S	S	; I	В	е		
	r		Α	_			r		
	Α						В		
36		\rightarrow							User A resumes call
37			→					UPDATE	UE_A sends UPDATE message indicating media
									stream active (Call Resume)
38				→				UPDATE	IMS_A S-CSCF forwards UPDATE to IMS_B
									S-CSCF
39					\rightarrow			UPDATE	IMS_B P-CSCF forwards UPDATE to UE_B
40						\rightarrow			User B is informed the call is resumed
41					(200 OK	UE_B responds to UPDATE with 200 OK
									indicating media stream active
42				←				200 OK	IMS_B S-CSCF forwards 200 OK response to
									IMS_A S-CSCF
43			←					200 OK	IMS_A P-CSCF forwards the 200 OK response to
									UE_A
44		←							User A is informed that call is resumed

4.5.3.2 Subsequent PRACK request procedures

		Test description			
Identifier:	TD_IMS_				
Summary:	Subseque	nt PRACK requests and 200 OK response procedures			
Configuration:	CF_MO2-	SS1-MT2	•		
References	Test purp	oose	Specification reference		
	TP_IMS_	5107_01	TS 124 229 [1], clause 5.4.3.2, ¶ 49		
	TP_IMS_		TS 124 229 [1], clause 5.4.3.3, ¶ 60		
Use Case:	UC_01				
Pre-test	• St	atic configuration as per clause 4.3	3		
conditions:		E_A, UE_B support 100rel, no SDF			
		A, UE_B have no filter criteria de			
		_A, UE_B IP bearers established			
		,, G Bearers setablished A registered using user_1_priv@			
		B_B registered using user_1_priv@			
		B registered deling deer_r_prive			
	1 01	_A, OL_B registered public identi	ties are on Ords only		
Test sequence:	Step				
Tool ooquonoo.	1 PR	Initiate an IMS VoIP call on LIE	A, addressed to "user_1_pub@ims-b.net"		
	111	(CFW step 1)	n, addressed to dsci_1_pub@iiiis b.iict		
	2 PR	Verify that UE_B rings (CFW ste	n 8)		
	3 PR	Verify that ringback is present at			
	4 TB	Answer the call at UE_B (CFW			
	5 PO		ed in both directions (CFW step 27)		
	6 PO	Release call at UE_A (CFW step			
	7 PO	Verify that call is released at UE_			
	710	verny that can is released at CE_	_D (OI W 310P 02)		
Conformance	Check				
criteria:	1	TP_IMS_5107_01 in CFW step 1	I4 (PRACK):		
0.110.101	-	ensure that {	i i (i i violo).		
		when { UE_A sends PRACK to	UF B}		
		then { IMS_B receives the PRA			
			arging-Vector_header		
			access-network-charging-info_parameter		
		or	3 3 -		
		not containing a P-	Charging-Vector_header)		
		and	,		
		not containing a P-	Access-Network-Info_header		
		and			
		UE_B receives the PRACK	()		
		}			



Step		Direction			on		Message	Comment
	U	U	I	I	U	U		
	s	Ε	M	M		_		
	е	Α	S	_		е		
	r		Α	В		r		
	Α					В		
13			\rightarrow				PRACK	UE_A acknowledges the receipt of 180 response
								by sending PRACK
14				\rightarrow			PRACK	IMS_A S-CSCF forwards PRACK to IMS_B
								S-CSCF
15					\rightarrow		PRACK	IMS_B P-CSCF forwards PRACK to UE_B
16					←		200 OK	UE_B responds PRACK with 200 OK
17				(200 OK	IMS_B S-CSCF forwards 200 OK response to
								IMS_A S-CSCF
18			←				200 OK	IMS_A P-CSCF forwards the 200 OK response to
								UE_A

4.5.3.3 Subsequent BYE request procedures

		Test description				
Identifier:	TD_IMS_0					
Summary:		ent BYE requests and 200 OK resp	onse procedures			
Configuration:	CF_MO2-					
References	Test purp		Specification reference			
	TP_IMS_		TS 124 229 [1], clause 5.4.3.2, ¶ 49			
	TP_IMS_5	5121_02	TS 124 229 [1], clause 5.4.3.3, ¶ 60			
Use Case:	UC_01					
Pro toot	01	-tititi				
Pre-test conditions:		atic configuration as per clause 4.3				
conditions.		E_A, UE_B support 100rel, no SDF				
		:_A, UE_B have no filter criteria de:_A, UE_B IP bearers established				
		:_A, 0E_B iF bearers established :_A registered using user_1_priv@				
		:_A registered using user_1_priv@ :_B registered using user_1_priv@				
		:_B registered using user_r_prive :_A, UE_B registered public identi				
	T OL	A, OL_B registered public identifi	lies are Sir Ords Orlly			
Test sequence:	Step					
	1 PR	Initiate an IMS VoIP call on UE_A	A, addressed to "user_1_pub@ims-b.net"			
		(CFW step 1)				
	2 PR	Verify that UE_B rings (CFW step				
	3 PR	Verify that ringback is present at	UE_A (CFW step 12)			
	4 PR	Answer the call at UE_B (CFW step 19)				
	5 PR	Verify that voice can be exchanged in both directions (CFW step 27)				
	6 TB	Release call at UE_A (CFW ste	0 28)			
		Warify that call is released at III	E D (CEW stop 22)			
	7 TB	Verify that call is released at U	E_B (CFW step 32)			
Conformance		Verify that call is released at U	E_B (CFW step 32)			
Conformance criteria:	7 TB Check					
	Check	TP_IMS_5107_02 in CFW step 3				
	Check	TP_IMS_5107_02 in CFW step 3	0 (BYE):			
	Check	TP_IMS_5107_02 in CFW step 3 ensure that { when { UE_A sends BYE to UE then { IMS_B receives the BYE	0 (BYE): E_B}			
	Check	TP_IMS_5107_02 in CFW step 3 ensure that { when { UE_A sends BYE to UE then { IMS_B receives the BYE (containing a P-Che	0 (BYE): E_B } arging-Vector_header			
	Check	TP_IMS_5107_02 in CFW step 3 ensure that { when { UE_A sends BYE to UE then { IMS_B receives the BYE (containing a P-Chi not containing a	0 (BYE): E_B}			
	Check	TP_IMS_5107_02 in CFW step 3 ensure that { when { UE_A sends BYE to UE then { IMS_B receives the BYE (containing a P-Che not containing a or	0 (BYE): E_B } arging-Vector_header access-network-charging-info_parameter			
	Check	TP_IMS_5107_02 in CFW step 3 ensure that { when { UE_A sends BYE to UE then { IMS_B receives the BYE	0 (BYE): E_B } arging-Vector_header			
	Check	TP_IMS_5107_02 in CFW step 3 ensure that { when { UE_A sends BYE to UE then { IMS_B receives the BYE	0 (BYE): E_B } arging-Vector_header access-network-charging-info_parameter Charging-Vector_header)			
	Check	TP_IMS_5107_02 in CFW step 3 ensure that { when { UE_A sends BYE to UE then { IMS_B receives the BYE	0 (BYE): E_B } arging-Vector_header access-network-charging-info_parameter			
	Check	TP_IMS_5107_02 in CFW step 3 ensure that { when { UE_A sends BYE to UE then { IMS_B receives the BYE	0 (BYE): E_B } arging-Vector_header access-network-charging-info_parameter Charging-Vector_header)			
	Check	TP_IMS_5107_02 in CFW step 3 ensure that { when { UE_A sends BYE to UE then { IMS_B receives the BYE	0 (BYE): E_B } arging-Vector_header access-network-charging-info_parameter Charging-Vector_header)			
	Check	TP_IMS_5107_02 in CFW step 3 ensure that { when { UE_A sends BYE to UE then { IMS_B receives the BYE	0 (BYE): E_B } arging-Vector_header access-network-charging-info_parameter Charging-Vector_header) Access-Network-Info_header			
	Check 1	TP_IMS_5107_02 in CFW step 3 ensure that { when { UE_A sends BYE to UE then { IMS_B receives the BYE	0 (BYE): E_B } arging-Vector_header access-network-charging-info_parameter Charging-Vector_header) Access-Network-Info_header 4 (200 OK):			
	Check 1	TP_IMS_5107_02 in CFW step 3 ensure that { when { UE_A sends BYE to UE then { IMS_B receives the BYE	0 (BYE): E_B } arging-Vector_header access-network-charging-info_parameter Charging-Vector_header) Access-Network-Info_header 4 (200 OK): ase to UE_A }			
	Check 1	TP_IMS_5107_02 in CFW step 3 ensure that { when { UE_A sends BYE to UE then { IMS_B receives the BYE	0 (BYE): E_B } arging-Vector_header access-network-charging-info_parameter Charging-Vector_header) Access-Network-Info_header 4 (200 OK): ase to UE_A } response			
	Check 1	TP_IMS_5107_02 in CFW step 3 ensure that { when { UE_A sends BYE to UE then { IMS_B receives the BYE	0 (BYE): E_B } arging-Vector_header access-network-charging-info_parameter Charging-Vector_header) Access-Network-Info_header 4 (200 OK): ase to UE_A } response arging-Vector_header			
	Check 1	TP_IMS_5107_02 in CFW step 3 ensure that { when { UE_A sends BYE to UE then { IMS_B receives the BYE	0 (BYE): E_B } arging-Vector_header access-network-charging-info_parameter Charging-Vector_header) Access-Network-Info_header 4 (200 OK): ase to UE_A } response			
	Check 1	TP_IMS_5107_02 in CFW step 3 ensure that { when { UE_A sends BYE to UE then { IMS_B receives the BYE	0 (BYE): E_B } arging-Vector_header access-network-charging-info_parameter Charging-Vector_header) Access-Network-Info_header 4 (200 OK): ase to UE_A } response arging-Vector_header access-network-charging-info_parameter			
	Check 1	TP_IMS_5107_02 in CFW step 3 ensure that { when { UE_A sends BYE to UE then { IMS_B receives the BYE	0 (BYE): E_B } arging-Vector_header access-network-charging-info_parameter Charging-Vector_header) Access-Network-Info_header 4 (200 OK): ase to UE_A } response arging-Vector_header			
	Check 1	TP_IMS_5107_02 in CFW step 3 ensure that { when { UE_A sends BYE to UE then { IMS_B receives the BYE	0 (BYE): E_B} arging-Vector_header access-network-charging-info_parameter Charging-Vector_header) Access-Network-Info_header 4 (200 OK): ase to UE_A} response arging-Vector_header access-network-charging-info_parameter Access-Network-Info_header			

Step		D	ire	cti	on			Message	Comment
_	U	U	I	I		U	U	-	
	s	Ε	M	N	1	Е	s		
	е	Α	S	5	3	В	е		
	r		Α	E	3		r		
	Α						В		
29			→					BYE	UE_A releases the call with BYE
30				\rightarrow				BYE	IMS_A S-CSCF forwards BYE to IMS_B
									S-CSCF
31					\rightarrow			BYE	IMS_B P-CSCF forwards BYE to UE_B
32						\rightarrow			User B is informed that call has ended
33					→			200 OK	UE_B sends 200 OK for BYE
34				(200 OK	IMS_B S-CSCF forwards 200 OK response to
									IMS_A S-CSCF
35			←					200 OK	IMS_A P-CSCF forwards the 200 OK response to
									UE_A

4.5.3.4 Subsequent INVITE target refresh request procedures

		Test description	
Identifier:	TD_IMS_0	0027	
Summary:	Subseque	ent INVITE target refresh requests	and 200 OK response procedures
Configuration:	CF_MO2-	SS1-MT2	
References	Test purp		Specification reference
	TP_IMS_5	5048_01	TS 124 229 [1], clause 5.2.6.3, ¶ 26
	TP_IMS_5	5058_02	TS 124 229 [1], clause 5.2.6.4, ¶ 67
	TP_IMS_5	5106_01	TS 124 229 [1], clause 5.4.3.2, ¶ 42
Use Case:	UC_06 (C	FW for reINVITE)	
Pre-test	• Sta	atic configuration as per clause 4.3	3
conditions:	• UE	_A, UE_B support 100rel, no SDF	P preconditions
	• UE	_A, UE_B have no filter criteria de	efined in HSS
	• UE	_A, UE_B IP bearers established	as per clause 4.2.1
	• UE	_A registered using user_1_priv@	ims-a.net as per clause 4.2.3
	• UE	B registered using user_1_priv@	ims-b.net as per clause 4.2.3
	• UE	_A, UE_B registered public identi	ties are SIP URIs only
	• UE	_A, UE_B support reINVITE meth	nod for call hold/resume
Test sequence:	Step		
	1 PR	Initiate an IMS VoIP call on UE_/ (CFW step 1)	A, addressed to "user_1_pub@ims-b.net"
	2 PR	Verify that UE_B rings (CFW ste	n 8)
	3 PR	Verify that ringback is present at	
	4 PR	Answer the call at UE_B (CFW s	
	5 PR		ed in both directions (CFW step 27)
	6 TB	Place call on hold at UE_A (CF	
	7 TB		be exchanged in both directions
		(CFW step 35)	•
	8 TB	Resume call at UE_A (CFW ste	ep 42)
	9 TB	Verify that voice can be excha-	nged in both directions (CFW step 53)
	10 PO	Release call at UE_A (CFW step	57)
	11 PO	Verify that call is released at UE	

		Test description
Conformance	Check	·
criteria:	1	TP_IMS_5048_01 in CFW step 31 and 45 (INVITE):
		ensure that {
		when { UE_A sends subsequent INVITEs to UE_B }
		then { IMS_B receives the subsequent INVITEs
		containing an additional Via_header
		containing (P-CSCF_port_number 'where it awaits the
		responses to arrive' and
		(P-CSCF-FQDN_address or
		P-CSCF-IP_address)) of IMS_A and
		containing an additional Record-Route_header
		containing (P-CSCF_port_number "where it awaits subsequent
		requests from the called party" and
		(P-CSCF-FQDN_address or
		P-CSCF-IP_address)) of IMS_A
		and
		UE_B receives INVITEs
		<u></u>
	0	} TD INO 5050 00: OFM + 07 + 154 (000 OL)
	2	TP_IMS_5058_02 in CFW step 37 and 51 (200 Ok):
		ensure that {
		when { UE_B sends 2xx_responses for subsequent INVITEs to UE_A }
		then { IMS_A receives 2xx_responses containing Record-Route_header
		containing the same P-CSCF_port_number of IMS_B "as in the
		response to the previous initial request" and
		not containing a comp_parameter
		and
		UE_A receives 2xx_responses
		}
		 }
	3	TP_IMS_5106_01 in CFW step 31 and 45 (INVITE):
		ensure that {
		when { UE_A sends subsequent INVITEs to UE_B }
		then { IMS_B receives the subsequent INVITEs
		containing a topmost Record-Route_header
		containing the S-CSCF_SIP_URI of IMS_A and
		containing a P-Charging-Vector_header
		not containing a access-network-charging-info_parameter
		and
		not containing a P-Access-Network-Info_header
		and
		UE_B receives the INVITEs }
		}

Step		D	ire	ctio	n		Message	Comment
	U	U	I	I	U	U	_	
	s	Ε	М	M		s		
	е	Α	S	S	В	е		
	r		Α	В		r		
	Α					В		
28		\rightarrow						User A puts call on hold
29		-	→				INVITE	UE_A sends reINVITE message indicating media
								stream inactive (Call Hold)
30		•	\leftarrow				100 Trying	IMS_A P-CSCF responds with a 100 Trying
								provisional response
31			-	→			INVITE	IMS_A S-CSCF forwards INVITE to IMS_B
								S-CSCF
32				\leftarrow			100 Trying	IMS_B S-CSCF responds with a 100 Trying
								provisional response
33				-	>		INVITE	IMS_B P-CSCF forwards INVITE to UE_B
34				(-		100 Trying	UE_B responds with a 100 Trying provisional
								response
35								User B is informed that call on hold

Step		D	ire	ecti	ion		Message	Comment
-	U	U	I				J	
	s	Ε			Λ		s	
	е	Α	S			В	e	
	r		Α	E	3		r	
	Α						3	
36					←		200 OK	UE_B responds to INVITE with 200 OK
								indicating media stream inactive
37				←			200 OK	IMS_B S-CSCF forwards 200 OK response to
								IMS_A S-CSCF
38			→				200 OK	IMS_A P-CSCF forwards the 200 OK response to
								UE_A
39			\rightarrow				ACK	UE_A acknowledges the receipt of 200 OK for
								INVITE
40				\rightarrow			ACK	IMS_A S-CSCF forwards ACK to IMS_B
								S-CSCF
41					\uparrow		ACK	IMS_B P-CSCF forwards ACK to UE_B
42								User A resumes call
43			\rightarrow				INVITE	UE_A sends reINVITE message indicating media
								stream active (Call Resume)
44			\leftarrow				100 Trying	IMS_A P-CSCF responds with a 100 Trying
								provisional response
45				\rightarrow			INVITE	IMS_A S-CSCF forwards INVITE to IMS_B
								S-CSCF
46				\leftarrow			100 Trying	IMS_B S-CSCF responds with a 100 Trying
								provisional response
47					\rightarrow		INVITE	IMS_B P-CSCF forwards INVITE to UE_B
48					←		100 Trying	UE_B responds with a 100 Trying provisional
								response
49								User B is informed the call is resumed
50					←		200 OK	UE_B responds to UPDATE with 200 OK
								indicating media stream active
51				\leftarrow			200 OK	IMS_B S-CSCF forwards 200 OK response to
								IMS_A S-CSCF
52			←				200 OK	IMS_A P-CSCF forwards the 200 OK response to
								UE_A
53								User A is informed that call is resumed

4.5.3.5 Subsequent CANCEL request procedures

		Test description	
Identifier:	TD_IMS_0		
Summary:		ent CANCEL request procedures	
Configuration:		SS1-MT2	
References	Test purp		Specification reference
	TP_IMS_5		TS 124 229 [1], clause 5.4.3.2, ¶ 49
	TP_IMS_5	5121_02	TS 124 229 [1], clause 5.4.3.3, ¶ 60
Use Case:	UC_04		
Pre-test conditions:	UEUEUEUEUE	atic configuration as per clause 4.3 —A support 100rel, no SDP preco —A have no filter criteria defined in —A IP bearers established as per —A registered using user_1_priv@ —B registered using user_1_priv@ —A registered public identities are	nditions n HSS clause 4.2.1 Dims-a.net as per clause 4.2.3 Dims-b.net as per clause 4.2.3
			,
Test sequence:	Step		
·	1 PR 2 PR	Initiate an IMS VoIP call on UE_/ (CFW step 1) Verify that UE_B rings (CFW step	A, addressed to "user_1_pub@ims-b.net"
	3 PR	Verify that ringback is present at	
	4 TB	End call at UE_A (CFW step 19	
	5 PO	Verify that call is ended at UE_B	
	310	TVEITIY THAT CAIL IS EFFICED AT OL_B	(Ci W step 20)
Conformance	Check		
criteria:	1	TP_IMS_5107_04 in CFW step 2	22 (CANCEL):
	-	ensure that {	(0, 11,022).
		when { UE_A sends CANCEL to	o UE B }
		then { IMS_B receives the CAN	
			narging-Vector_header
			access-network-charging-info_parameter
		or	3 3 =
		not containing a	P-Charging-Vector_header) and
		not containing a	P-Access-Network-Info_header
		and	
		UE_B receives the CANCE }	EL }
	2	TP_IMS_5121_02 in CFW step 2 ensure that {	23 (200 OK):
	2	ensure that { when { UE_B sends 2xx_respondent { IMS_A receives the 2xx_	nse to UE_A } response
	2	ensure that { when { UE_B sends 2xx_respointhen { IMS_A receives the 2xx_(containing a series.}	nse to UE_A }
	2	ensure that { when { UE_B sends 2xx_respointhen { IMS_A receives the 2xx_(containing a series or not containing a series or not contain the series or not contain	nse to UE_A } response ntaining a P-Charging-Vector_header

Step	Direction						Message	Comment
	U	U	I	I	U	U	_	
	s	Ε	М			s		
	е	Α	S	S	В	е		
	r		Α	В		r		
	Α	L.	<u>L,</u>	Ц,	Ц,	В		
19		\rightarrow						User A cancel ringing
20			\rightarrow				CANCEL	UE_A sends CANCEL to abort call
21			→				200 OK	IMS_A P-CSCF responds with a 200 OK
								response
22				\rightarrow			CANCEL	IMS_A S-CSCF sends CANCEL to IMS_B S-
								CSCF
23				+			200 OK	IMS_B S-CSCF responds with a 200 OK
								response
24				-)		CANCEL	IMS_B P-CSCF sends CANCEL to UE_B
25				•	1		200 OK	UE_B responds with a 200 OK response
26					-	>		User B informed that call is aborted
27				•	\leftarrow		487 Request Terminated	UE_B confirms cancellation of the INVITE request
								with a 487 Request Terminated error response
28)		ACK	IMS_B P-CSCF responds with an ACK to UE_B
29				(Ì		487 Request Terminated	IMS_B S-CSCF sends a 487 Request Terminated
							·	error response to IMS_A S-CSCF
30				\rightarrow	Ì		ACK	IMS_A S-CSCF responds with an ACK
31			←				487 Request Terminated	IMS_B P-CSCF sends a 487 Request Terminated
							·	error response to UE_A
32			\rightarrow				ACK	UE_A responds with an ACK

History

Document history							
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