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Reference

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Keywords

IMS, interoperability, interworking, NNI, testing

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# 1 Scope

The present document specifies interoperability Test Purposes (TPs) for IMS NNI interworking based on the IP Multimedia Call Control Protocol based on Stage 3 Session Initiation Protocol (SIP) and Session Description Protocol (SDP) standard, TS 124 229 [1].

TPs are defined using the TPLan notation also described in ES 202 553 [4]. Test purposes have been written based on the test specification framework described in TS 102 351 [2] and the interoperability testing methodology defined in TS 102 237-1 [3], i.e. interoperability testing with conformance checking.

The scope of these test purposes is not to cover all requirements specified in TS 124 229 [1]. TPs have been only specified for requirements that are observable at the interface between two IMS core network implementations, i.e. IMS NNI. For the purpose of the present document an IMS core network as a whole - not its components - are considered to be under test.

In a separate section a set of test purposes has been developed to cover the MGCF aspects as defined in clause 5.5 of TS 124 229 [1]. To trigger events at the Mg and Mj reference point the IMS core network will connect to a PSTN network via an MGCF. The interworking between IMS and PSTN is described in TS 129 163 [6].

NOTE: Requirements pertaining to a UE or an AS implementation or IMS core network requirements that can only be observed at the interface between UE and IMS CN are explicitly not within the scope of the present document. The latter requirements have been dealt with from a UE and conformance perspective in TS 134 229-3 [5].

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## 2 References

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

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

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

### 2.1 Normative references

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

- [1] ETSI TS 124 229 (V9.5.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3 (3GPP TS 24.229 version 9.5.0 Release 9)".
- [2] ETSI TS 102 351: "Methods for Testing and Specification (MTS); Internet Protocol Testing (IPT); IPv6 Testing: Methodology and Framework".
- [3] 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".
- [4] ETSI ES 202 553: "Methods for Testing and Specification (MTS); TPLan: A notation for expressing Test Purposes".
- [5] ETSI TS 134 229-3 (V7.2.0): "Universal Mobile Telecommunications System (UMTS); LTE; Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Part 3: Abstract test suite (ATS) (3GPP TS 34.229-3 version 7.2.0 Release 7)".

- [6] ETSI TS 129 163 (V9.4.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Interworking between the IP Multimedia (IM) Core Network (CN) subsystem and Circuit Switched (CS) networks (3GPP TS 29.163 version 9.4.0 Release 9)".
- [7] RCS-e Advanced Communications: "Services and Client Specification Version 1.1".

## 2.2 Informative references

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

Not applicable.

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## 3 Abbreviations

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

3GPP	3 <sup>rd</sup> Generation Partnership Project
ACK	(positive) ACKnowledgement
ACM	Address Complete Message
AKA	Authentication and Key Agreement
ANM	Answer Message
AS	(IMS) Application Server
ATS	Abstract Test Suite
CF	(Test) Configuration
CN	Core Network
CPG	Call ProGress Message
CSCF	Call Session Control Function
DB	Data Base
DNS	Domain Name System
ENUM	E.164 Number Mapping
GRUU	Globally Routable User agent URI
HSS	Home Subscriber Server
IAM	Initial Address Message
IBCF	Interconnection Border Control Gateway
I-CSCF	Interrogating CSCF
IMS	IP Multimedia Subsystem
IOI	Inter Operator Identifier
IP	Internet Protocol
IPTV	IP TeleVision
IUT	Implementation Under Test
MGCF	Media Gateway Control Function
MRFC	Multimedia Resource Function Controller
NAPTR	Naming Authority Pointer Record
NGN	Next Generation Network
NNI	Network-to-Network Interface
NWK	NetWorK
PCO	Point of Control and Observation
P-CSCF	Proxy CSCF
PSTN	Public Switched Telephone Network
RC	Requirements Catalogue
REL	RELease
RQ	Requirement
S-CSCF	Serving CSCF
SDP	Session Description Protocol
SIP	Session Initiation Protocol
TP	Test Purpose
TPLan	Test Purpose Notation
TSS	Test Suite Structure

TTL	Time To Live
UE	User Equipment
URI	Uniform Record Identifier

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## 4 Test Suite Structure (TSS)

The Test Suite Structure is based on a Requirements Catalogue which was established prior to test purpose specification. This RC extracts all requirements from [1] which are relevant to the scope of this work. The TSS is defined by the groups within the following TPLan specification of test purposes. The numbering is not contiguous so that new TPs can be added at a later date without the need to completely renumber the TSS groups.

**NOTE:** The requirements catalogue is at this point not accessible as an ETSI document. Requirement identifiers of the catalogue have been replaced in the present document with the location of the requirement in the base specification, i.e. base specification type, identifier, version, clause and paragraph.

**EXAMPLE:** TS 124 229 (V8.10.0), clause 5.2.6.3 ¶66.

The test purposes have been divided into 6 major groups:

- 1) General Capabilities
- 2) Registration procedures
- 3) Dialog procedures
- 4) Messaging procedures
- 5) Supplementary services
- 6) MGCF tests for IMS-PSTN interconnection

These groups have been further divided into subgroups according to IMS components as follows:

```

Group 1: IMST2 NNI IOP
Group 1.1: General Capabilities
Group 1.2: Registration procedures
Group 1.2.1: Registration at P-CSCF
Group 1.2.2: Registration at S-CSCF
Group 1.2.3: Registration at I-CSCF
Group 1.2.4: Registration at IBCF
Group 1.3: Dialog procedures
Group 1.3.1: Dialog at P-CSCF
Group 1.3.2: Dialog at S-CSCF
Group 1.3.3: Dialog at I-CSCF
Group 1.3.4: Dialog at IBCF
Group 1.4: Messaging procedures
Group 1.4.1: Messaging at P-CSCF
Group 1.4.2: Messaging at S-CSCF
Group 1.5: Supplementary service procedures
Group 1.5.1: Supplementary services at S-CSCF

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## 5 Test Purposes (TP)

The test purposes have been written in the notation TPLan [4] which has been developed at ETSI to express test purposes in a more formal manner. All TPLan TPs have been converted into a symbolic tabular presentation format which is shown in this clause. TPs in the standardized textual TPLan syntax are collected in archive ts\_18601101v040103p0.zip that is included in the electronic annex of the present document. The two presentation formats, i.e. textual and symbolic tabular, contain the same information and shall therefore be considered equivalent. In the case that there appears to be syntactical or semantic differences between the two then the files in the electronic annex take precedence over the following tables. Configurations that are referenced by test purposes are shown in Annex B.

## 5.1 The tabular symbolic TPLan presentation format

Each table contains header fields and a description part. The header fields identify the TP, list the related clause reference the base specification that the TP was derived from, introduce the TP with a short summary, references the related test configuration and test case in the ATS.

The description part presents the TP using two sections:

- a) initial conditions that have to be fulfilled for the test purpose body to be valid; and
- b) the test purpose body which is illustrated with one or more stimulus/response pairs.

Both sections are further substructured with columns for affected entities from the test configurations, i.e. IUT, UE, UE2, IMS (test system component) and AS.

The condition section lists one or more conditions that have to be fulfilled in order for the test purpose body to apply. Each condition has a description and either "✓" or "✗" marks to indicate all the entities affected by this condition. "✓" marks indicates a positive condition, e.g. "A is registered in B", whereas "✗"marks indicate a negative condition, e.g. "B not configured for feature Z". If there is no mark in a column then the condition does not apply for that entity, e.g. entity A is not involved in the condition "B not configured for feature Z". It is assumed that all listed conditions have to be fulfilled in the order listed, i.e. the list reflects an "and" relation.

Table 1 shows an example condition section illustrating all of the above examples.

**Table 1: Example TP condition section**

Entities		Condition
A	B	
✓	✓	A registered in B
	✗	B not configured for feature Z

The test purpose body section contains one or more steps identified with a number in the first column. Steps belonging IUT stimuli are shown with a green background whereas steps related to IUT responses are shown with a beige background. All listed steps are assumed to be carried out in increasing step number, i.e. they reflect an "and" relation. "or" relations at the level of entire messages are shown with lowercase letters following the step number identifying the different alternatives, e.g. "2a" versus "2b". Each step indicates the exchange of a message from a source entity (identified by the direction symbols "↳" or "↵"), e.g. entity A sends the message, to a destination entity (identified by the direction symbols "↵" or "↳"), e.g. entity B receives the message. The use of the "||" symbol in combination with the direction symbols, e.g. "||↳", indicates that a particular message shall either not be sent or received by an entity, e.g. entity B did not send the message.

Additional information about valid as well as invalid message content is presented in the "Message" column. First general information about message, e.g. its type, destination, attributes, etc, are shown in bold font. Below this information message headers or parameter content that must be present in that message are listed using "✓" symbols whereas headers or parameter content that must *not* be present are listed using the "✗" symbols. The "➔" symbol indicates a valid message parameter value whereas the "➔||" symbol indicates an invalid message parameter value. Any content, e.g. header or parameter, which is not explicitly mentioned in a message description of a TP is not restricted by that TP. The "✓" symbol together with "➔||" symbol means that the message header **MUST** be present but it cannot contain a specific message parameter value. The "✗" symbol together with "➔" symbol means that the message header **MAY** be present but it cannot contain a specific message parameter value.

Finally, the interface identifier to which a message exchange pertains may be shown in the column labelled "IF".

Table 2 shows an example test purpose body section illustrating all of the above examples.



Table 2: Example TP body section

Step	A	B	Message	IF
1	↔	↔	<b>some request</b> ✓ this header ✓ this one parameter → this value ✓ this other parameter →   that value * that parameter * that header	Xx
2a	↔	↔	<b>failure response</b>	Xx
2b	↔	↔	<b>no message</b>	Xx

## 5.2 General Capabilities

Test Purpose					
<b>Identifier:</b>	TP_IMS_4002_01				
<b>Summary:</b>	IMS CN components shall support SIP messages > 1 300 bytes				
<b>IUT Role:</b>	IMS A				
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 4.2A ¶1	<b>Config Ref:</b>		CF_INT_CALL	
Entities				Condition	
UE A	IMS A	IMS B	UE B		
✓	✓			UE A registered in IMS A	
		✓	✓	UE B registered in IMS B	
UE A	IMS A	IMS B	UE B		
Step	Direction			Message	IF
1	↔	↔		<b>MESSAGE</b> addressed to UE B ✓ a Message Body greater than 1 300 bytes	
2		↔	↔	<b>MESSAGE</b> ✓ the Message Body greater than 1 300 bytes	

## 5.3 Registration Procedures

### 5.3.1 Registration at P-CSCF

Test Purpose					
<b>Identifier:</b>	TP_IMS_5005_01				
<b>Summary:</b>	The P-CSCF shall support the Path header				
<b>IUT Role:</b>	IMS A				
<b>References:</b>	TS 124 229 (V9.5.0), [1] clause 5.2.1 ¶8	<b>Config Ref:</b>		CF_ROAM_REG	
Entities				Condition	
IMS A	IMS B	UE B			
	✓	✓	IMS B has challenged with a 401 response the REGISTER request of UE B		
IMS A	IMS B	UE B			
Step	Direction			Message	IF
1	↔		↔	<b>protected REGISTER</b> addressed to IMS B ✓ a Path header	
2	↔	↔		<b>REGISTER</b> ✓ a Path header	

Test Purpose					
<b>Identifier:</b>	TP_IMS_5011_01				
<b>Summary:</b>	In case of IMS AKA as security mechanism the P-CSCF shall forward REGISTER requests received from the UE to the entry point in the home network				
<b>IUT Role:</b>	IMS A				
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.2.2.1 ¶16 (2 <sup>nd</sup> numbered list) and 5.2.2.2	<b>Config Ref:</b>		CF_ROAM_REG	
<b>Entities</b>			<b>Condition</b>		
	<b>IMS A</b>	<b>IMS B</b>	<b>UE B</b>		
	x			IMS A not configured for topology hiding	
		✓	✓	user of UE B existing in IMS B	
	x		x	UE B has not established a security association with IUT	
	<b>IMS A</b>	<b>IMS B</b>	<b>UE B</b>		
<b>Step</b>	<b>Direction</b>			<b>Message</b>	<b>IF</b>
<b>1</b>	↔		↔	<b>unprotected REGISTER</b> ✓ a Security-Client header	
<b>2</b>	↔	↔		<b>REGISTER</b> <ul style="list-style-type: none"> <li>✓ a Path header</li> <li>✓ P-CSCF SIP URI of IMS A</li> <li>✓ a Require header</li> <li>✓ a path option tag</li> <li>✓ a P-Charging-Vector header</li> <li>✓ an icid-value parameter</li> <li>✓ an orig-ioi parameter <ul style="list-style-type: none"> <li>→ IMS A</li> </ul> </li> <li>* a term-ioi parameter</li> <li>✓ a Authorization header</li> <li>✓ an integrity-protected parameter <ul style="list-style-type: none"> <li>→ no</li> </ul> </li> <li>* a Security-Verify header</li> <li>* a Security-Client header</li> <li>✓ a P-Visited-Network-ID header <ul style="list-style-type: none"> <li>→ the visited network at the home network</li> </ul> </li> </ul>	

Test Purpose					
<b>Identifier:</b>	TP IMS_5011_02				
<b>Summary:</b>	In case of IMS AKA as security mechanism the P-CSCF shall forward REGISTER requests received from the UE to the entry point in the home network				
<b>IUT Role:</b>	IMS A				
<b>References:</b>	TS 124 229 (V9.5.0) [1], clauses 5.2.2.1 ¶1 ¶16 (2 <sup>nd</sup> numbered list) and 5.2.2.2		<b>Config Ref:</b>	CF_ROAM_REG	
	<b>Entities</b>			<b>Condition</b>	
	<b>IMS A</b>	<b>IMS B</b>	<b>UE B</b>		
	x			IMS A not configured for topology hiding	
		✓	✓	user of UE B existing in IMS B	
	✓		✓	UE B has established a security association with IUT	
	<b>IMS A</b>	<b>IMS B</b>	<b>UE B</b>		
<b>Step</b>	<b>Direction</b>			<b>Message</b>	<b>IF</b>
<b>1</b>	↵		↵	<b>protected REGISTER</b> ✓ a Security-Client header	
<b>2</b>	↵	↵		<b>REGISTER</b> <ul style="list-style-type: none"> <li>✓ a Path header</li> <li>✓ P-CSCF SIP URI of IMS A</li> <li>✓ a Require header</li> <li>✓ a path option tag</li> <li>✓ a P-Charging-Vector header</li> <li>✓ an icid parameter</li> <li>✓ an orig-ioi parameter <ul style="list-style-type: none"> <li>→ IMS A</li> </ul> </li> <li>* a term-ioi parameter</li> <li>✓ a Authorization header</li> <li>✓ an integrity-protected parameter <ul style="list-style-type: none"> <li>→ yes</li> </ul> </li> <li>* a Security-Verify header</li> <li>* a Security-Client header</li> <li>✓ a P-Visited-Network-ID header <ul style="list-style-type: none"> <li>→ the visited network at the home network</li> </ul> </li> </ul>	

Test Purpose				
<b>Identifier:</b>	TP_IMS_5011_03			
<b>Summary:</b>	In case of IMS digest as security mechanism the P-CSCF shall forward REGISTER requests received from the UE to the entry point in the home network			
<b>IUT Role:</b>	IMS A			
<b>References:</b>	TS 124 229 (V9.5.0) [1], clauses 5.2.2.1 ¶16 (2 <sup>nd</sup> numbered list) and 5.2.2.3	<b>Config Ref:</b>	CF_ROAM_REG	
Entities			Condition	
IMS A	IMS B	UE B		
x			IMS A not configured for topology hiding	
	✓	✓	user of UE B existing in IMS B	
x		x	UE B has not established a security association with IUT	
IMS A	IMS B	UE B		
Step	Direction		Message	IF
1	↔	↔	unprotected REGISTER	
2	↔	↔	<b>REGISTER</b> <ul style="list-style-type: none"> <li>✓ a Path header</li> <li>✓ P-CSCF SIP URI of IMS A</li> <li>✓ a Require header</li> <li>✓ a path option tag</li> <li>✓ a P-Charging-Vector header</li> <li>✓ an icid-value parameter</li> <li>✓ an orig-ioi parameter <ul style="list-style-type: none"> <li>→ IMS A</li> </ul> </li> <li>* a term-ioi parameter</li> <li>✓ a Authorization header</li> <li>✓ an integrity-protected parameter <ul style="list-style-type: none"> <li>→ ip-assoc-pending or</li> </ul> </li> <li>* an integrity-protected parameter</li> <li>✓ a P-Visited-Network-ID header <ul style="list-style-type: none"> <li>→ the visited network at the home network</li> </ul> </li> </ul>	

Test Purpose				
<b>Identifier:</b>	TP_IMS_5011_04			
<b>Summary:</b>	In case of IMS digest as security mechanism the P-CSCF shall forward REGISTER requests received from the UE to the entry point in the home network			
<b>IUT Role:</b>	IMS A			
<b>References:</b>	TS 124 229 (V9.5.0) [1], clauses 5.2.2.1 ¶1 ¶16 (2 <sup>nd</sup> numbered list) and 5.2.2.3	<b>Config Ref:</b>	CF_ROAM_REG	
Entities			Condition	
IMS A	IMS B	UE B		
x			IMS A not configured for topology hiding	
	✓	✓	user of UE B existing in IMS B	
x		x	UE B has established a security association with IUT	
IMS A	IMS B	UE B		
Step	Direction		Message	IF
1	↔	↔	protected REGISTER	
2	↔	↔	<b>REGISTER</b> <ul style="list-style-type: none"> <li>✓ a Path header</li> <li>✓ P-CSCF SIP URI of IMS A</li> <li>✓ a Require header</li> <li>✓ a path option tag</li> <li>✓ a P-Charging-Vector header</li> <li>✓ an icid parameter</li> <li>✓ an orig-ioi parameter <ul style="list-style-type: none"> <li>→ IMS A</li> </ul> </li> <li>* a term-ioi parameter</li> <li>✓ a Authorization header</li> <li>✓ an integrity-protected parameter <ul style="list-style-type: none"> <li>→ ip-assoc-yes</li> </ul> </li> <li>✓ a P-Visited-Network-ID header <ul style="list-style-type: none"> <li>→ the visited network at the home network</li> </ul> </li> </ul>	

Test Purpose					
<b>Identifier:</b>	TP_IMS_5203_01				
<b>Summary:</b>	The P-CSCF have received a REGISTER request from the UE and modified a number of headers and forwarded the request to an entry point with no response				
<b>IUT Role:</b>	IMS A				
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.2.2.1 ¶33 (item 6 in 2 <sup>nd</sup> numbered list)	<b>Config Ref:</b>	CF_ROAM_REG		
	Entities			Condition	
	IMS A	IMS B	UE B		
	✓		✓	UE B having sent an initial REGISTER to IMS A	
	✓	✓		IMS A configured with multiple entry points for IMS B	
	IMS A	IMS B	UE B		
<b>Step</b>	<b>Direction</b>			<b>Message</b>	<b>IF</b>
1	⇐	⇒		Any response	
2	⇐	⇒		REGISTER addressed to another entry point	

Test Purpose					
<b>Identifier:</b>	TP_IMS_5203_02				
<b>Summary:</b>	The P-CSCF have received a REGISTER request from the UE and modified a number of headers and forwarded the request to an entry point with 3xx				
<b>IUT Role:</b>	IMS A				
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.2.2.1 ¶33 (item 6 in 2 <sup>nd</sup> numbered list)	<b>Config Ref:</b>	CF_ROAM_REG		
	Entities			Condition	
	IMS A	IMS B	UE B		
	✓		✓	UE B having sent an initial REGISTER to IMS A	
	✓	✓		IMS A configured with multiple entry points for IMS B	
	IMS A	IMS B	UE B		
<b>Step</b>	<b>Direction</b>			<b>Message</b>	<b>IF</b>
1	⇐	⇒		3xx response	
2	⇐	⇒		REGISTER addressed to another entry point	

Test Purpose					
<b>Identifier:</b>	TP_IMS_5203_03				
<b>Summary:</b>	The P-CSCF have received a REGISTER request from the UE and modified a number of headers and forwarded the request to an entry point with 480				
<b>IUT Role:</b>	IMS A				
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.2.2.1 ¶33 (item 6 in 2 <sup>nd</sup> numbered list)	<b>Config Ref:</b>	CF_ROAM_REG		
	Entities			Condition	
	IMS A	IMS B	UE B		
	✓		✓	UE B having sent an initial REGISTER to IMS A	
	✓	✓		IMS A configured with multiple entry points for IMS B	
	IMS A	IMS B	UE B		
<b>Step</b>	<b>Direction</b>			<b>Message</b>	<b>IF</b>
1	⇐	⇒		480 response	
2	⇐	⇒		REGISTER addressed to another entry point	

Test Purpose				
<b>Identifier:</b>	TP IMS 5044_01			
<b>Summary:</b>	The P-CSCF have received a REGISTER request from the UE and modified a number of headers and forwarded the request to an entry point			
<b>IUT Role:</b>	IMS A			
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.2.3 ¶2 (1 <sup>st</sup> numbered list)	<b>Config Ref:</b>	CF_ROAM_REG	
	<b>Entities</b>			<b>Condition</b>
	<b>IMS A</b>	<b>IMS B</b>	<b>UE B</b>	
	✓		✓	UE B having sent a protected REGISTER to IMS A
	x			IMS A not configured for topology hiding
	<b>IMS A</b>	<b>IMS B</b>	<b>UE B</b>	
<b>Step</b>	<b>Direction</b>			<b>Message</b>
<b>1</b>	↵	↵		<b>200 response</b>
<b>2</b>	↵	↵		<b>SUBSCRIBE</b> <ul style="list-style-type: none"> <li>✓ a Request URI</li> <li>✓ "the resource to which the P-CSCF wants to subscribe to" and</li> <li>✓ a From header <ul style="list-style-type: none"> <li>✓ P-CSCF_SIP_URI of IMS_A and</li> </ul> </li> <li>✓ a To_header <ul style="list-style-type: none"> <li>✓ the default_public_user_identity of UE_B and</li> </ul> </li> <li>✓ an Event_header <ul style="list-style-type: none"> <li>✓ the reg event package and</li> </ul> </li> <li>✓ an Expires_header <ul style="list-style-type: none"> <li>→ "a value greater than the one in the Expires_header of the 200_response" and</li> </ul> </li> <li>✓ a P-Asserted-Identity_header <ul style="list-style-type: none"> <li>✓ the P-CSCF_SIP_URI of IMS_A and</li> </ul> </li> <li>✓ a P-Charging-Vector header <ul style="list-style-type: none"> <li>✓ an icid-value parameter</li> </ul> </li> </ul>

## 5.3.2 Registration at S-CSCF

Test Purpose				
<b>Identifier:</b>	TP_IMS_5088_01			
<b>Summary:</b>	S-CSCF shall deregister unexpired registration upon receipt of a new REGISTER with new contact information			
<b>IUT Role:</b>	IMS B			
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.1.2.1 ¶7 (item 2 in 1 <sup>st</sup> numbered list)	<b>Config Ref:</b>	CF_ROAM_REG	
Entities			Condition	
IMS A	IMS B	UE B		
✓	✓	✓	UE B registered in IMS B via IMS A	
✓	✓		IMS A within the trust domain of IMS B	
	x	x	UE B not de-registered in IMS B	
IMS A	IMS B	UE B		
Step	Direction		Message	IF
<b>1a</b>		↔	<b>initial REGISTER</b> <ul style="list-style-type: none"> <li>✓ an Authorization header</li> <li>✓ an integrity-protected parameter → no or tls-pending or ip-assoc-pending</li> </ul>	
<b>1b</b>		↔	<b>initial REGISTER</b> <ul style="list-style-type: none"> <li>✓ an Authorization header</li> <li>* an integrity-protected parameter</li> </ul>	
<b>2</b>	↔	↔	<b>NOTIFY</b> <ul style="list-style-type: none"> <li>✓ a Request URI → the P-CSCF SIP URI of IMS A</li> <li>✓ an Event header → the reg event package</li> <li>✓ a P-Charging-Vector header ✓ an icid-value parameter</li> <li>✓ a Route header → the original Route header from SUBSCRIBE</li> <li>✓ a Message Body ✓ for each registered public identity of UE B a registration element ✓ an aor attribute → registered public identity of UE B</li> <li>✓ a state attribute → terminated</li> <li>✓ a contact subelement ✓ an event attribute → deactivated or rejected</li> <li>✓ a state attribute → terminated</li> <li>✓ a URI subelement → the contact address of UE B</li> </ul>	





Test Purpose				
<b>Identifier:</b>	<b>TP IMS_5092_01</b>			
<b>Summary:</b>	200 OK on REGISTER from UE to the S-CSCF			
<b>IUT Role:</b>	IMS B			
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.1.2.2F ¶1	<b>Config Ref:</b>	CF_ROAM_REG	
Entities			Condition	
IMS A	IMS B	UE B		
	✓	✓	user of UE B existing in IMS B	
✓		✓	UE B visiting IMS A	
	x	x	UE B not registered in IMS B	
	✓		IMS B has challenged with a 401 response the REGISTER request	
Step	Direction		Message	IF
1	↵	↶	protected REGISTER	
2	↵	↶	<b>200 response</b> <ul style="list-style-type: none"> <li>✓ the same Path header as in the protected REGISTER</li> <li>✓ a P-Associated-URI header</li> <li>✓ all registered public identities its associated set of implicitly registered public user identities <ul style="list-style-type: none"> <li>→ first the default public user identity no barred public user identities</li> </ul> </li> <li>✓ a Service-Route header <ul style="list-style-type: none"> <li>→ the S-CSCF SIP URI of IMS B</li> </ul> </li> <li>✓ a P-Charging-Vector header</li> <li>✓ a term-voi parameter <ul style="list-style-type: none"> <li>→ operator identifier of IMS B</li> </ul> </li> <li>✓ a Contact header <ul style="list-style-type: none"> <li>→ all contact addresses for the default public user identity of UE B</li> </ul> </li> </ul>	

Test Purpose				
<b>Identifier:</b>	<b>TP IMS_5096_01</b>			
<b>Summary:</b>	The network shall handle incoming SUBSCRIBE correctly			
<b>IUT Role:</b>	IMS B			
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.2.1.1 ¶1	<b>Config Ref:</b>	CF_ROAM_REG	
Entities			Condition	
IMS A	IMS B	UE B		
	✓	✓	UE B registered in IMS B	
✓		✓	UE B visiting IMS A	
Step	Direction		Message	IF
1	↵	↶	<b>SUBSCRIBE</b> <ul style="list-style-type: none"> <li>✓ an Event header <ul style="list-style-type: none"> <li>→ the reg event package</li> </ul> </li> </ul>	
2		↶	<b>2xx response</b> <ul style="list-style-type: none"> <li>✓ an Expires header <ul style="list-style-type: none"> <li>→ the same or lower expiry time than specified in the initial SUBSCRIBE</li> </ul> </li> </ul>	



Test Purpose				
Identifier:	TP IMS_5094_01			
Summary:	S-CSCF shall register in network-initiated re-authentication			
IUT Role:	IMS B			
References:	TS 124 229 (V9.5.0) [1], clause 5.4.1.6 ¶2	Config Ref:	CF_ROAM_REG	
Entities			Condition	
IMS A	IMS B	UE B		
✓	✓	✓	UE B registered in IMS B via IMS A	
✓	✓		IMS A within the trust domain of IMS B	
	✓		IMS B receives an event to reauthenticate UE_B	
IMS A	IMS B	UE B		
Step	Direction		Message	IF
1	↔	↔	network initiated reauthentication event	
2	↔	↔	<b>NOTIFY</b> <ul style="list-style-type: none"> <li>✓ a Request URI <ul style="list-style-type: none"> <li>→ UE_B</li> </ul> </li> <li>✓ an Event header <ul style="list-style-type: none"> <li>→ the reg event package</li> </ul> </li> <li>✓ a P-Charging-Vector header <ul style="list-style-type: none"> <li>✓ an icid-value parameter</li> </ul> </li> <li>✓ a Route header <ul style="list-style-type: none"> <li>→ the original Route header from SUBSCRIBE</li> </ul> </li> <li>✓ a Message Body <ul style="list-style-type: none"> <li>✓ for each registered public identity of UE B <ul style="list-style-type: none"> <li>a registration element <ul style="list-style-type: none"> <li>✓ an aor attribute <ul style="list-style-type: none"> <li>→ registered public identity of UE B</li> </ul> </li> <li>✓ a state attribute <ul style="list-style-type: none"> <li>→ active</li> </ul> </li> </ul> </li> <li>✓ a contact subelement <ul style="list-style-type: none"> <li>✓ an event attribute <ul style="list-style-type: none"> <li>→ shortened</li> </ul> </li> <li>✓ a state attribute <ul style="list-style-type: none"> <li>→ active</li> </ul> </li> </ul> </li> <li>✓ a URI subelement <ul style="list-style-type: none"> <li>→ the contact address of UE B</li> </ul> </li> </ul> </li> </ul> </li></ul>	
3	↔	↔	<b>NOTIFY</b> <ul style="list-style-type: none"> <li>✓ a Request URI <ul style="list-style-type: none"> <li>→ the P-CSCF_SIP_URI of IMS_A</li> </ul> </li> <li>✓ an Event header <ul style="list-style-type: none"> <li>→ the reg event package</li> </ul> </li> <li>✓ a P-Charging-Vector header <ul style="list-style-type: none"> <li>✓ an icid-value parameter</li> </ul> </li> <li>✓ a Route header <ul style="list-style-type: none"> <li>→ the original Route header from SUBSCRIBE</li> </ul> </li> <li>✓ a Message Body <ul style="list-style-type: none"> <li>✓ for each registered public identity of UE A <ul style="list-style-type: none"> <li>a registration element <ul style="list-style-type: none"> <li>✓ an aor attribute <ul style="list-style-type: none"> <li>→ registered public identity of UE B</li> </ul> </li> <li>✓ a state attribute <ul style="list-style-type: none"> <li>→ active</li> </ul> </li> </ul> </li> <li>✓ a contact subelement <ul style="list-style-type: none"> <li>✓ an event attribute <ul style="list-style-type: none"> <li>→ shortened</li> </ul> </li> <li>✓ a state attribute <ul style="list-style-type: none"> <li>→ active</li> </ul> </li> </ul> </li> <li>✓ a URI subelement <ul style="list-style-type: none"> <li>→ the contact address of UE B</li> </ul> </li> </ul> </li> </ul> </li></ul>	

## 5.3.3 Registration at I-CSCF

Interoperability Test Purpose				
<b>Identifier:</b>	TP_IMS_5129_01			
<b>Summary:</b>	If a request is received from a non-trusted domain, a 403 (Forbidden) response shall be returned by I-CSCF			
<b>IUT Role:</b>	IMS B			
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.3.1.2 ¶1	<b>Config Ref:</b>	CF_ROAM_REG	
Entities			Condition	
IMS A	IMS B	UE B		
	✓	✓	user of UE B existing in IMS B	
x	x		IMS A not within the trust domain of IMS B	
IMS A	IMS B	UE B		
Step	Direction		Message	IF
1	↙	↘	valid initial REGISTER	
2	↙	↘	403 response	

## 5.3.4 Registration at IBCF

Interoperability Test Purpose				
<b>Identifier:</b>	TP_IMS_5134_01			
<b>Summary:</b>	If a request includes a Path header the IBCF shall add the routeable SIP URI of an IBCF to the top of the Path header			
<b>IUT Role:</b>	IMS A			
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.10.4.1 ¶5	<b>Config Ref:</b>	CF_ROAM_REG	
Entities			Condition	
IMS A	IMS B	UE B		
✓			IMS A configured for topology hiding	
IMS A	IMS B	UE B		
Step	Direction		Message	IF
1	↙	↘	REGISTER	
2	↙	↘	REGISTER ✓ an additional topmost Path header → the IBCF SIP URI of IMS A	

Interoperability Test Purpose				
<b>Identifier:</b>	TP_IMS_5401_01			
<b>Summary:</b>	IBCF shall, if topology hiding is required, apply the encryption for the Path header			
<b>IUT Role:</b>	IMS A			
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.10.2.1 ¶1	<b>Config Ref:</b>	CF_ROAM_REG	
Entities			Condition	
IMS A	IMS B	UE B		
✓			IMS A configured for topology hiding	
IMS A	IMS B	UE B		
Step	Direction		Message	IF
1	↙	↘	REGISTER ✓ Path header	
2	↙	↘	REGISTER ✓ a Path header ✓ encrypted consecutive header entries ✓ tokenized-by parameter	

Interoperability Test Purpose				
<b>Identifier:</b>	TP_IMS_5402_01			
<b>Summary:</b>	IBCF shall select a new entry point and forward the original REGISTER request on no response.			
<b>IUT Role:</b>	IMS A			
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.10.2.1 ¶1 (item 3 in 1 <sup>st</sup> numbered list)	<b>Config Ref:</b>	CF_ROAM_REG	
<b>Entities</b>		<b>Condition</b>		
	<b>IMS A</b>	<b>IMS B</b>		
	✓		IMS A configured for topology hiding	
	✓	✓	IMS A configured with multiple entry points in IMS B	
	✓	✓	IMS A having sent an initial REGISTER to IMS B	
	<b>IMS A</b>	<b>IMS B</b>		
<b>Step</b>	<b>Direction</b>		<b>Message</b>	<b>IF</b>
1	↔	↔	Any response	
2	↔	↔	original REGISTER addressed to another entry point	

Interoperability Test Purpose				
<b>Identifier:</b>	TP_IMS_5402_02			
<b>Summary:</b>	IBCF shall select a new entry point and forward the original REGISTER request on 3xx response.			
<b>IUT Role:</b>	IMS A			
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.10.2.1 ¶1 (item 3 in 1 <sup>st</sup> numbered list)	<b>Config Ref:</b>	CF_ROAM_REG	
<b>Entities</b>		<b>Condition</b>		
	<b>IMS A</b>	<b>IMS B</b>		
	✓		IMS A configured for topology hiding	
	✓	✓	IMS A configured with multiple entry points for IMS B	
	✓	✓	IMS A having sent an initial REGISTER to IMS B	
	<b>IMS A</b>	<b>IMS B</b>		
<b>Step</b>	<b>Direction</b>		<b>Message</b>	<b>IF</b>
1	↔	↔	3xx response	
2	↔	↔	original REGISTER addressed to another entry point	

Interoperability Test Purpose				
<b>Identifier:</b>	TP_IMS_5402_03			
<b>Summary:</b>	IBCF shall select a new entry point and forward the original REGISTER request on 480 response.			
<b>IUT Role:</b>	IMS A			
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.10.2.1 ¶1 (item 3 in 1 <sup>st</sup> numbered list)	<b>Config Ref:</b>	CF_ROAM_REG	
<b>Entities</b>		<b>Condition</b>		
	<b>IMS A</b>	<b>IMS B</b>		
	✓		IMS A configured for topology hiding	
	✓	✓	IMS A configured with multiple entry points for IMS B	
	✓	✓	IMS A having sent an initial REGISTER to IMS B	
	<b>IMS A</b>	<b>IMS B</b>		
<b>Step</b>	<b>Direction</b>		<b>Message</b>	<b>IF</b>
1	↔	↔	480 response	
2	↔	↔	original REGISTER addressed to another entry point	



Test Purpose						
<b>Identifier:</b>	TP_IMS_5046_02					
<b>Summary:</b>	When the P-CSCF receives an initial INVITE request for a dialog from a UE for which a Service-Route header list exists with topology hiding					
<b>IUT Role:</b>	IMS A					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.2.6.3.3 ¶1 (1 <sup>st</sup> numbered list)			<b>Config Ref:</b>	CF_ROAM_CALL	
	<b>Entities</b>				<b>Condition</b>	
	<b>UE A</b>	<b>IMS A</b>	<b>IMS B</b>	<b>UE B</b>		
	✓	✓			UE A registered in IMS A	
			✓	✓	UE B registered in IMS B	
		✓			IMS A configured for topology hiding	
	<b>UE A</b>	<b>IMS A</b>	<b>IMS B</b>	<b>UE B</b>		
<b>Step</b>	<b>Direction</b>				<b>Message</b>	<b>IF</b>
<b>1</b>		↶		↷	<b>initial INVITE</b>	
<b>2</b>		↷	↶		<b>INVITE</b> <ul style="list-style-type: none"> <li>✓ a topmost Route header <ul style="list-style-type: none"> <li>→ the IBCF SIP URI of IMS A</li> <li>→   the P-CSCF SIP URI of IMS A</li> </ul> </li> <li>✓ a Route header <ul style="list-style-type: none"> <li>✓ the list of Service Route header URIs from the registration</li> </ul> </li> <li>✓ an additional Via header <ul style="list-style-type: none"> <li>✓ the P-CSCF via port number</li> <li>✓ the P-CSCF-FQDN address <b>or</b> the P-CSCF-IP address of the IMS A</li> </ul> </li> <li>✓ an additional topmost Record-Route header <ul style="list-style-type: none"> <li>✓ the P-CSCF port number where it awaits subsequent requests from UE A</li> <li>✓ the P-CSCF-FQDN address <b>or</b> the P-CSCF-IP address of the IMS A</li> </ul> </li> <li>✗ P-Preferred-Identity header</li> <li>✓ a P-Asserted-Identity header <ul style="list-style-type: none"> <li>✓ an address of UE A</li> </ul> </li> <li>✓ a P-Charging-Vector header <ul style="list-style-type: none"> <li>✓ an icid-value parameter</li> </ul> </li> </ul>	

Test Purpose						
<b>Identifier:</b>	TP_IMS_5046_03					
<b>Summary:</b>	When the P-CSCF receives an initial request for a dialog from a UE for which a Service-Route header list exists without topology hiding					
<b>IUT Role:</b>	IMS A					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.2.6.3.3 ¶1 (1 <sup>st</sup> numbered list)	<b>Config Ref:</b>		CF_ROAM_CALL		
	<b>Entities</b>				<b>Condition</b>	
	<b>UE A</b>	<b>IMS A</b>	<b>IMS B</b>	<b>UE B</b>		
	✓	✓			UE A registered in IMS A	
			✓	✓	UE B registered in IMS B	
		x			IMS A not configured for topology hiding	
	<b>UE A</b>	<b>IMS A</b>	<b>IMS B</b>	<b>UE B</b>		
<b>Step</b>	<b>Direction</b>				<b>Message</b>	<b>IF</b>
<b>1</b>		↶		↷	<b>SUBSCRIBE</b>	
<b>2</b>		↶	↷		<b>SUBSCRIBE</b> <ul style="list-style-type: none"> <li>✓ a topmost Route header <ul style="list-style-type: none"> <li>➔   the P-CSCF SIP URI of IMS A</li> </ul> </li> <li>✓ a Route header <ul style="list-style-type: none"> <li>✓ the list of Service Route header URIs from the registration</li> </ul> </li> <li>✓ an additional Via header <ul style="list-style-type: none"> <li>✓ the P-CSCF via port number</li> <li>✓ the P-CSCF-FQDN address <b>or</b> the P-CSCF-IP address of the IMS A</li> </ul> </li> <li>✓ an additional topmost Record-Route header <ul style="list-style-type: none"> <li>✓ the P-CSCF port number where it awaits subsequent requests from UE A</li> <li>✓ the P-CSCF-FQDN address <b>or</b> the P-CSCF-IP address of the IMS A</li> </ul> </li> <li>✗ P-Preferred-Identity header</li> <li>✓ a P-Asserted-Identity header <ul style="list-style-type: none"> <li>✓ an address of UE A</li> </ul> </li> <li>✓ a P-Charging-Vector header <ul style="list-style-type: none"> <li>✓ an icid-value parameter</li> </ul> </li> </ul>	





Test Purpose						
<b>Identifier:</b>	TP IMS_5052_01					
<b>Summary:</b>	The P-CSCF modifies a request, other than a target refresh request, from the UE subsequent to a successful initial request for a dialog					
<b>IUT Role:</b>	IMS A					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.2.6.3.9 ¶1 (1 <sup>st</sup> numbered list)		<b>Config Ref:</b>		CF_ROAM_CALL	
Entities				Condition		
UE A	IMS A	IMS B	UE B			
✓	✓			UE A registered in IMS A		
		✓	✓	UE B registered in IMS B		
✓			✓	UE B has initiated a dialog with UE A		
UE A	IMS A	IMS B	UE B			
Step	Direction			Message		IF
1		↵	↵	BYE		
2		↵	↵	<b>BYE</b> <ul style="list-style-type: none"> <li>* a Route header <ul style="list-style-type: none"> <li>✓ the P-CSCF SIP URI of IMS A</li> <li>✓ the same Record-Route header as in the previous <b>ACK</b></li> <li>✓ a P-Charging-Vector header</li> <li>✓ an icid-value parameter</li> </ul> </li> </ul>		

Test Purpose						
<b>Identifier:</b>	TP IMS_5053_01					
<b>Summary:</b>	P-CSCF receives from the UE a request for an unknown method without topology hiding					
<b>IUT Role:</b>	IMS A					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.2.6.3.11 ¶1 (1 <sup>st</sup> numbered list)		<b>Config Ref:</b>		CF_ROAM_CALL	
Entities				Condition		
UE A	IMS A	IMS B	UE B			
✓	✓			UE A registered in IMS A		
		✓	✓	UE B registered in IMS B		
	x			IMS A not configured for topology hiding		
UE A	IMS A	IMS B	UE B			
Step	Direction			Message		IF
1	↵	↵		Unknown Method addressed to UE B		
2		↵	↵	<b>Unknown Method</b> <ul style="list-style-type: none"> <li>✓ a Route header <ul style="list-style-type: none"> <li>→ the list of Service Route header URIs from the registration</li> </ul> </li> <li>* a P-Preferred-Identity header</li> <li>✓ a P-Asserted-Identity header</li> <li>✓ an address of UE A</li> </ul>		

Test Purpose						
<b>Identifier:</b>	TP_IMS_5053_02					
<b>Summary:</b>	P-CSCF receives from the UE a request for an unknown method with topology hiding					
<b>IUT Role:</b>	IMS A					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.2.6.3.11 ¶1 (1 <sup>st</sup> numbered list)	<b>Config Ref:</b>		CF_ROAM_CALL		
Entities				Condition		
	UE A	IMS A	IMS B	UE B		
	✓	✓			UE A registered in IMS A	
			✓	✓	UE B registered in IMS B	
		✓			IMS A configured for topology hiding	
	UE A	IMS A	IMS B	UE B		
Step	Direction				Message	IF
1	↵	↶			<b>Unknown Method</b> addressed to UE B	
2		↵	↶		<b>Unknown Method</b> <ul style="list-style-type: none"> <li>✓ a Route header <ul style="list-style-type: none"> <li>→ the list of Service Route header URIs from the registration</li> </ul> </li> <li>* a P-Preferred-Identity header</li> <li>✓ a P-Asserted-Identity header</li> <li>✓ an address of UE A</li> </ul>	

Test Purpose						
<b>Identifier:</b>	TP_IMS_5055_01					
<b>Summary:</b>	The P-CSCF receives a 180 response to an initial request for a dialog from the UE					
<b>IUT Role:</b>	IMS A					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.2.6.4.4 ¶1 (1 <sup>st</sup> numbered list)	<b>Config Ref:</b>		CF_ROAM_CALL		
Entities				Condition		
	UE A	IMS A	IMS B	UE B		
	✓	✓			UE A registered in IMS A	
			✓	✓	UE B registered in IMS B	
	✓			✓	UE A has received an initial request for a dialog from UE B	
	UE A	IMS A	IMS B	UE B		
Step	Direction				Message	IF
1	↵	↶			<b>180 response</b>	
2		↵	↶		<b>180 response</b> <ul style="list-style-type: none"> <li>✓ a Record-Route header <ul style="list-style-type: none"> <li>→ the P-CSCF SIP URI and port number of IMS A where it expects subsequent requests</li> </ul> </li> <li>* a comp parameter</li> <li>* a P-Preferred-Identity header</li> <li>✓ a P-Asserted-Identity header</li> <li>✓ the public identity sent in P-Called Party-ID header sent in the initial request</li> </ul>	



Test Purpose						
<b>Identifier:</b>	TP_IMS_5072_01					
<b>Summary:</b>	P-CSCF sends CANCEL in case its UE goes down during dialog initiation					
<b>IUT Role:</b>	IMS A					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.2.8.1.1 ¶1			<b>Config Ref:</b>	CF_ROAM_CALL	
Entities					Condition	
UE A	NWK	IMS A	IMS B	UE B		
✓		✓			UE A registered in IMS A	
			✓	✓	UE B registered in IMS B	
✓				✓	UE B has received 180 on initial request for dialog from UE A	
UE A	NWK	IMS A	IMS B	UE B		
Step	Direction				Message	IF
1		↘	↗		an indication that UE B is no longer available	
2	↘		↘		<b>CANCEL</b> <ul style="list-style-type: none"> <li>✓ a Reason header</li> <li>✓ a status code parameter <ul style="list-style-type: none"> <li>→ 503 Service Unavailable</li> </ul> </li> </ul>	
3		↘	↗		503 response	

Test Purpose						
<b>Identifier:</b>	TP_IMS_5073_01					
<b>Summary:</b>	P-CSCF sends BYE in case its calling UE goes down in ongoing dialog					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.2.8.1.2 ¶1 (item 1 in 1 <sup>st</sup> numbered list)			<b>Config Ref:</b>	CF_INT_CALL	
Entities					Condition	
UE A	IMS A	NWK	IMS B	UE B		
✓	✓				UE A registered in IMS A	
			✓	✓	UE B registered in IMS B	
✓				✓	UE B has initiated a dialog with UE A	
UE A	IMS A	NWK	IMS B	UE B		
Step	Direction				Message	IF
1		↘	↗		an indication that UE B is no longer available	
2	↘		↘		<b>BYE</b> <ul style="list-style-type: none"> <li>✓ Request URI <ul style="list-style-type: none"> <li>→ Contact header value of UE A</li> </ul> </li> <li>✓ To header <ul style="list-style-type: none"> <li>→ initial 200 OK To value from UE A</li> </ul> </li> <li>✓ From header <ul style="list-style-type: none"> <li>→ initial INVITE From value from UE B</li> </ul> </li> <li>✓ Call-ID header <ul style="list-style-type: none"> <li>→ initial INVITE Call Id value from UE B</li> </ul> </li> <li>✓ CSeq header <ul style="list-style-type: none"> <li>✓ an incremented Sequence Number</li> </ul> </li> <li>✓ Route header <ul style="list-style-type: none"> <li>→ dialog specific routing information for UE A</li> </ul> </li> <li>✓ Reason header <ul style="list-style-type: none"> <li>→ 503 Service Unavailable</li> </ul> </li> <li>✓ further headers based on local policy or call release reason</li> </ul>	





## 5.4.2 Dialog at S-CSCF

Test Purpose						
<b>Identifier:</b>	TP_IMS_5097_01					
<b>Summary:</b>	S-CSCF must insert orig-ioi parameter, remove access-network-charging-info parameter and P-Access-Network-Info header before sending initial INVITE or a initial request over NNI					
<b>IUT Role:</b>	IMS A					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶11 (1 <sup>st</sup> numbered list)			<b>Config Ref:</b>	CF_INT_CALL CF_ROAM_AS	
Entities				Condition		
UE A	IMS A	IMS B	UE B			
✓	✓			UE A registered in IMS A		
		✓	✓	UE B registered in IMS B		
	✗			IMS A not configured for topology hiding		
UE A	IMS A	IMS B	UE B			
Step	Direction			Message	IF	
1	↵	↶		initial INVITE addressed to UE B (also valid for SUBSCRIBE)		
2		↵	↶	<b>initial INVITE</b> <ul style="list-style-type: none"> <li>✗ a Route header <ul style="list-style-type: none"> <li>→ the S-CSCF SIP URI of IMS A</li> </ul> </li> <li>✓ a P-Charging-Vector header</li> <li>✓ an icid-value parameter</li> <li>✓ an orig-ioi parameter <ul style="list-style-type: none"> <li>→ IMS A</li> </ul> </li> <li>✗ an access-network-charging-info parameter</li> <li>✗ a term-ioi parameter</li> <li>✓ a Record-Route header <ul style="list-style-type: none"> <li>→ the originating S-CSCF SIP URI</li> </ul> </li> <li>✗ a P-Access-Network-Info header</li> </ul>		

Test Purpose						
<b>Identifier:</b>	TP_IMS_5097_02					
<b>Summary:</b>	S-CSCF inserts a second P-Asserted-Identity header indicating a registered tel URI or sip URI whichever is not present in initial INVITE					
<b>IUT Role:</b>	IMS A					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶11 (item 9 1 <sup>st</sup> numbered list)			<b>Config Ref:</b>	CF_INT_CALL	
Entities				Condition		
UE A	IMS A	IMS B	UE B			
✓	✓			UE A registered in IMS A		
		✓	✓	UE B registered in IMS B		
✓				UE A registered public identities containing a Tel URI and a SIP URI		
UE A	IMS A	IMS B	UE B			
Step	Direction			Message	IF	
1	↵	↶		initial INVITE addressed to UE B		
2		↵	↶	<b>initial INVITE</b> <ul style="list-style-type: none"> <li>✓ a P-Asserted-Identity header <ul style="list-style-type: none"> <li>→ the SIP URI of UE A</li> </ul> </li> <li>✓ a P-Asserted-Identity header <ul style="list-style-type: none"> <li>→ the Tel URI of UE A</li> </ul> </li> </ul>		





Test Purpose						
<b>Identifier:</b>	TP_IMS_5106_02					
<b>Summary:</b>	S-CSCF must handle UPDATE prior to sending it over NNI					
<b>IUT Role:</b>	IMS A					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶108 (6 <sup>th</sup> numbered list)			<b>Config Ref:</b>	CF_INT_CALL	
Entities				Condition		
UE A	IMS A	IMS B	UE B			
✓	✓			UE A registered in IMS A		
		✓	✓	UE B registered in IMS B		
✓			✓	UE A has initiated a dialog with UE B		
UE A	IMS A	IMS B	UE B			
Step	Direction			Message		IF
1	↵	↶		UPDATE addressed to UE B		
2		↵	↶	<b>UPDATE</b> ✓ a Record-Route header ✓ the S-CSCF SIP URI of IMS A * Route header → the S-CSCF SIP URI of IMS A ✓ a P-Charging-Vector header * an access-network-charging-info parameter		

Test Purpose						
<b>Identifier:</b>	TP_IMS_5107_01					
<b>Summary:</b>	S-CSCF removes its own SIP URI from the route header before sending BYE					
<b>IUT Role:</b>	IMS A					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶119 (item 1 in 8 <sup>th</sup> numbered list)			<b>Config Ref:</b>	CF_INT_CALL	
Entities				Condition		
UE A	IMS A	IMS B	UE B			
✓	✓			UE A registered in IMS A		
		✓	✓	UE B registered in IMS B		
✓			✓	UE A has initiated a dialog with UE B		
UE A	IMS A	IMS B	UE B			
Step	Direction			Message		IF
1	↵	↶		BYE addressed to UE B		
2		↵	↶	<b>BYE</b> * Route header → the S-CSCF SIP URI of IMS A		

Test Purpose						
<b>Identifier:</b>	TP_IMS_5107_02					
<b>Summary:</b>	S-CSCF removes its own SIP URI from the route header before sending ACK					
<b>IUT Role:</b>	IMS A					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶119 (item 1 in 8 <sup>th</sup> numbered list)			<b>Config Ref:</b>	CF_INT_CALL	
Entities				Condition		
UE A	IMS A	IMS B	UE B			
✓	✓			UE A registered in IMS A		
		✓	✓	UE B registered in IMS B		
✓			✓	UE A has received 200OK on initial request for dialog UE B		
UE A	IMS A	IMS B	UE B			
Step	Direction			Message		IF
1	↵	↶		ACK addressed to UE B		
2		↵	↶	<b>ACK</b> * Route header → the S-CSCF SIP URI of IMS A		

Test Purpose					
<b>Identifier:</b>	TP_IMS_5107_03				
<b>Summary:</b>	S-CSCF removes its own SIP URI from the route header before sending CANCEL				
<b>IUT Role:</b>	IMS A				
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶119 (item 1 in 8 <sup>th</sup> numbered list)	<b>Config Ref:</b>		CF_INT_CALL	
Entities				Condition	
UE A	IMS A	IMS B	UE B		
✓	✓			UE A registered in IMS A	
		✓	✓	UE B registered in IMS B	
✓			✓	UE A has received 180 on initial request for dialog from UE B	
UE A	IMS A	IMS B	UE B		
Step	Direction			Message	IF
1	↵	↶		CANCEL addressed to UE B	
2		↵	↶	CANCEL *Route header → the S-CSCF SIP URI of IMS A	

Test Purpose					
<b>Identifier:</b>	TP_IMS_5107_04				
<b>Summary:</b>	S-CSCF removes its own SIP URI from the route header before sending REFER				
<b>IUT Role:</b>	IMS A				
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶119 (item 1 in 8 <sup>th</sup> numbered list)	<b>Config Ref:</b>		CF_INT_CALL	
Entities				Condition	
UE A	IMS A	IMS B	UE B		
✓	✓			UE A registered in IMS A	
		✓	✓	UE B registered in IMS B	
✓			✓	UE A has received 200OK on initial request for dialog to MRFC AS in IMS A	
UE A	IMS A	IMS B	UE B		
Step	Direction			Message	IF
1	↵	↶		REFER addressed to UE B	
2		↵	↶	REFER * Route header → the S-CSCF SIP URI of IMS A	

Test Purpose					
<b>Identifier:</b>	TP_IMS_5108_05				
<b>Summary:</b>	S-CSCF rejects barred users on initial INVITE				
<b>IUT Role:</b>	IMS B				
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶8 (item 1 in 1 <sup>st</sup> numbered list)	<b>Config Ref:</b>		CF_INT_CALL	
Entities				Condition	
UE A	IMS A	IMS B	UE B		
✓	✓			UE A registered in IMS A	
		✓	✓	UE B registered in IMS B	
		✓	✓	UE B barred user in IMS B	
UE A	IMS A	IMS B	UE B		
Step	Direction			Message	IF
1		↵	↶	initial INVITE addressed to UE B ✓ a Request URI → a barred user in IMS B	
2		↵	↶	404 response	

Test Purpose						
<b>Identifier:</b>	TP_IMS_5115_01					
<b>Summary:</b>	S-CSCF include term-ioi parameter and restores orig-ioi in 180 responses from UE to initial requests in terminating network					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶91 (item 2 in 4 <sup>th</sup> numbered list)			<b>Config Ref:</b>	CF_INT_CALL	
Entities				Condition		
	UE A	IMS A	IMS B	UE B		
	✓	✓			UE A registered in IMS A	
			✓	✓	UE B registered in IMS B	
	✓			✓	UE B has received an initial request for a dialog from UE A	
	UE A	IMS A	IMS B	UE B		
<b>Step</b>	Direction			Message		<b>IF</b>
1			↶	↷	180 response addressed to UE A	
2		↶	↷		<b>180 response</b> ✓ a P-Charging-Vector header ✓ an orig-ioi parameter → operator identifier of IMS A ✓ a term-ioi parameter → operator identifier of IMS B	

Test Purpose						
<b>Identifier:</b>	TP_IMS_5115_02					
<b>Summary:</b>	S-CSCF include term-ioi parameter and restores orig-ioi in 2xx responses from UE to initial requests in terminating network					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶91 (item 2 in 4 <sup>th</sup> numbered list)			<b>Config Ref:</b>	CF_INT_CALL	
Entities				Condition		
	UE A	IMS A	IMS B	UE B		
	✓	✓			UE A registered in IMS A	
			✓	✓	UE B registered in IMS B	
	✓			✓	UE A has received 180 on initial request for dialog from UE B	
	UE A	IMS A	IMS B	UE B		
<b>Step</b>	Direction			Message		<b>IF</b>
1			↶	↷	2xx response addressed to UE A	
2		↶	↷		<b>2xx response</b> ✓ a P-Charging-Vector header ✓ an orig-ioi parameter → operator identifier of IMS A ✓ a term-ioi parameter → operator identifier of IMS B	



Test Purpose						
<b>Identifier:</b>	<b>TP_IMS_5120_01</b>					
<b>Summary:</b>	S-CSCF must Remove its URI from the Route header and insert its SIP-URI in the Record Route header on a target refresh request					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶99 (item 3 and 5 in 7 <sup>th</sup> numbered list)			<b>Config Ref:</b>	CF_ROAM_CALL	
Entities				Condition		
UE A	IMS A	IMS B	UE B			
✓	✓			UE A registered in IMS A		
		✓	✓	UE B registered in IMS B		
✓			✓	UE A has initiated a dialog with UE B		
UE A	IMS A	IMS B	UE B			
Step	Direction			Message		IF
1	↵		↵	subsequent INVITE addressed to UE B		
2		↵	↵	<b>INVITE</b> ✗ a topmost Route header → the S-CSCF SIP URI of IMS B ✓ a Record-Route header ✓ the S-CSCF SIP URI		

Test Purpose						
<b>Identifier:</b>	<b>TP_IMS_5120_02</b>					
<b>Summary:</b>	S-CSCF must Remove its URI from the Route header and insert its SIP-URI in the Record Route header on a target refresh request					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶99 (item 3 and 5 in 7 <sup>th</sup> numbered list)			<b>Config Ref:</b>	CF_ROAM_CALL	
Entities				Condition		
UE A	IMS A	IMS B	UE B			
✓	✓			UE A registered in IMS A		
		✓	✓	UE B registered in IMS B		
✓			✓	UE A has initiated a dialog with UE B		
UE A	IMS A	IMS B	UE B			
Step	Direction			Message		IF
1	↵		↵	UPDATE addressed to UE B		
2		↵	↵	<b>UPDATE</b> ✗ a topmost Route header → the S-CSCF SIP URI of IMS B ✓ a Record-Route header ✓ the S-CSCF SIP URI		

Test Purpose						
<b>Identifier:</b>	<b>TP_IMS_5121_01</b>					
<b>Summary:</b>	S-CSCF remove access-network-charging-info parameter from 1xx response to subsequent or target refresh requests					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶123 (9 <sup>th</sup> numbered list)			<b>Config Ref:</b>	CF_INT_CALL	
Entities				Condition		
UE A	IMS A	IMS B	UE B			
✓	✓			UE A registered in IMS A		
		✓	✓	UE B registered in IMS B		
			✓	UE B has received a subsequent or target refresh request in a dialog		
UE A	IMS A	IMS B	UE B			
Step	Direction			Message		IF
1		↵	↵	1xx response addressed to UE A		
2		↵	↵	<b>1xx response</b> ✓ a P-Charging-Vector header ✗ an access-network-charging-info parameter		

Test Purpose						
<b>Identifier:</b>	TP IMS_5121_02					
<b>Summary:</b>	S-CSCF remove access-network-charging-info parameter from 2xx response to subsequent or target refresh requests					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶123 (9 <sup>th</sup> numbered list)			<b>Config Ref:</b>	CF_INT_CALL	
Entities				Condition		
	UE A	IMS A	IMS B	UE B		
	✓	✓			UE A registered in IMS A	
			✓	✓	UE B registered in IMS B	
				✓	UE B has received a subsequent or target refresh request in a dialog	
	UE A	IMS A	IMS B	UE B		
<b>Step</b>	Direction			Message		<b>IF</b>
<b>1</b>			↔	↔	2xx response addressed to UE A	
<b>2</b>		↔	↔		<b>2xx response</b> ✓ a P-Charging-Vector header * an access-network-charging-info parameter	

Test Purpose						
<b>Identifier:</b>	TP IMS_5301_01					
<b>Summary:</b>	S-CSCF shall prior to forwarding a subsequent request remove its own URI from the Route header and add it to the Record-Route header					
<b>IUT Role:</b>	IMS A					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶126 (10 <sup>th</sup> numbered list)			<b>Config Ref:</b>	CF_ROAM_CALL	
Entities				Condition		
	UE A	IMS A	IMS B	UE B		
	✓	✓			UE A registered in IMS A	
			✓	✓	UE B registered in IMS B	
	✓			✓	UE A has initiated a dialog with UE B	
	UE A	IMS A	IMS B	UE B		
<b>Step</b>	Direction			Message		<b>IF</b>
<b>1</b>	↔	↔			BYE	
<b>2</b>		↔	↔		<b>BYE</b> ✓ Route header →    the S-CSCF SIP URI of IMS A ✓ a topmost Record-Route header → the S-CSCF SIP URI of IMS A	





Test Purpose						
<b>Identifier:</b>	TP IMS 5139 02					
<b>Summary:</b>	In case the S-CSCF serves the called user and the S-CSCF receives a network internal indication to release an existing multimedia session including registration lifetime expiration of the last public user identity					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.5.1.2 ¶1 (item 3 and 4 in 1 <sup>st</sup> numbered list)			<b>Config Ref:</b>	CF_INT_CALL	
Entities					Condition	
UE A	IMS A	IMS B	NWK	UE B		
✓	✓				UE A registered in IMS A	
		✓		✓	UE B registered in IMS B	
✓				✓	UE A has initiated a dialog with UE B	
UE A	IMS A	IMS B	NWK	UE B		
Step	Direction				Message	IF
1			↔	↔	network internal indication that the lifetime of the last public user identity has expired	
2	↔		↔		<b>BYE</b> <ul style="list-style-type: none"> <li>✓ a Request URI <ul style="list-style-type: none"> <li>→ Contact header value of UE A</li> </ul> </li> <li>✓ a To header <ul style="list-style-type: none"> <li>→ the From header of the initial INVITE</li> </ul> </li> <li>✓ a From header <ul style="list-style-type: none"> <li>→ the To header of the 200 response to initial INVITE</li> </ul> </li> <li>✓ a Call-ID header <ul style="list-style-type: none"> <li>→ the Call-ID header of the initial INVITE</li> </ul> </li> <li>✓ a CSeq header <ul style="list-style-type: none"> <li>→ CSeq header of the called user incremented by one</li> </ul> </li> <li>✓ a Route header <ul style="list-style-type: none"> <li>→ routing information towards the calling user as stored for the dialog</li> </ul> </li> <li>✓ a Reason header</li> <li>✓ further headers, based on local policy or the requested session release reason</li> </ul>	
2			↔	↔	<b>BYE</b> <ul style="list-style-type: none"> <li>✓ a Request URI <ul style="list-style-type: none"> <li>→ Contact address of UE A</li> </ul> </li> <li>✓ a To header <ul style="list-style-type: none"> <li>→ the To header of the 200 response to initial INVITE</li> </ul> </li> <li>✓ a From header <ul style="list-style-type: none"> <li>→ the From header of the initial INVITE</li> </ul> </li> <li>✓ a Call-ID header <ul style="list-style-type: none"> <li>→ the Call-ID header of the initial INVITE</li> </ul> </li> <li>✓ a CSeq header <ul style="list-style-type: none"> <li>→ CSeq header of the calling user incremented by one</li> </ul> </li> <li>✓ a Route header <ul style="list-style-type: none"> <li>→ routing information towards the calling user as stored for the dialog</li> </ul> </li> <li>✓ a Reason header</li> <li>✓ further headers, based on local policy or the requested session release reason</li> </ul>	

## 5.4.3 Dialog at I-CSCF

Test Purpose						
<b>Identifier:</b>	TP_IMS_5131_01					
<b>Summary:</b>	I-CSCF shall remove P-Charging-Function-Addresses header from 180 response to initial request					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.3.2.1 ¶62 (after note 11)			<b>Config Ref:</b>	CF_INT_CALL	
Entities				Condition		
	UE A	IMS A	IMS B	UE B		
	✓	✓			UE A registered in IMS A	
			✓	✓	UE B registered in IMS B	
	✓			✓	UE B has received an initial request for a dialog from UE A	
	UE A	IMS A	IMS B	UE B		
<b>Step</b>	Direction			Message		<b>IF</b>
1			↵	↵	180 response addressed to UE A	
2		↵	↵		180 response * a P-Charging-Function-Addresses header	

Test Purpose						
<b>Identifier:</b>	TP_IMS_5131_02					
<b>Summary:</b>	I-CSCF shall remove P-Charging-Function-Addresses header from 200 response to initial request					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.3.2.1 ¶Clause 5.3.2.1 ¶62 (after note 11)			<b>Config Ref:</b>	CF_INT_CALL	
Entities				Condition		
	UE A	IMS A	IMS B	UE B		
	✓	✓			UE A registered in IMS A	
			✓	✓	UE B registered in IMS B	
	✓			✓	UE A has received 180 on initial request for dialog from UE B	
	UE A	IMS A	IMS B	UE B		
<b>Step</b>	Direction			Message		<b>IF</b>
1			↵	↵	2xx response addressed to UE A	
2		↵	↵		2xx response * a P-Charging-Function-Addresses header	

Test Purpose						
<b>Identifier:</b>	TP_IMS_5132_01					
<b>Summary:</b>	I-CSCF shall return an appropriate response to initial request to non-existent user					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.3.2.1 ¶54 (after 5 <sup>th</sup> numbered list)			<b>Config Ref:</b>	CF_INT_CALL	
Entities				Condition		
	UE A	IMS A	IMS B	UE B		
	✓	✓			UE A registered in IMS A	
			x		IMS B not configured with local policy to attempt request routing	
			x	x	UE B not registered in IMS B	
	UE A	IMS A	IMS B	UE B		
<b>Step</b>	Direction			Message		<b>IF</b>
1		↵	↵		initial INVITE addressed to UE B ✓ a Request URI → a non existing user in IMS B	
2a		↵	↵		404 response	
2b		↵	↵		604 response	

Test Purpose					
<b>Identifier:</b>	TP IMS 5133_01				
<b>Summary:</b>	I-CSCF shall return unsuccessful response to initial request to non-registered user				
<b>IUT Role:</b>	IMS B				
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.3.2.1 ¶55 (before 6 <sup>th</sup> numbered list)		<b>Config Ref:</b>	CF_INT_CALL	
Entities				Condition	
UE A	IMS A	IMS B	UE B		
✓	✓			UE A registered in IMS A	
		x	x	UE B not registered in IMS B	
		x	x	IMS B not configured with a terminating unregistered filter criterion for UE B	
UE A	IMS A	IMS B	UE B		
Step	Direction			Message	IF
1		↵	⇒	initial INVITE addressed to UE B	
2		↵	⇒	4xx response	

#### 5.4.4 Dialog at IBCF

Test Purpose					
<b>Identifier:</b>	TP IMS 5135_01				
<b>Summary:</b>	If a request includes a Record-Route header the IBCF shall add its own routeable SIP URI to the top of the Record-Route header				
<b>IUT Role:</b>	IMS A				
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.10.4.1 ¶7 (after note 4)		<b>Config Ref:</b>	CF_INT_CALL	
Entities				Condition	
UE A	IMS A	IMS B	UE B		
✓	✓			UE A registered in IMS A	
		✓	✓	UE B registered in IMS B	
	✓			IMS A configured for topology hiding	
UE A	IMS A	IMS B	UE B		
Step	Direction			Message	IF
1		↵	⇒	initial INVITE	
2		↵	⇒	initial INVITE ✓ an additional topmost Record-Route header ✓ the IBCF SIP URI of IMS A	



Test Purpose						
<b>Identifier:</b>	TP IMS 5137_03					
<b>Summary:</b>	The IBCF shall perform encryption for topology hiding before 200 response is sent					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.10.4.2 ¶(item 8 in 1 <sup>st</sup> numbered list)			<b>Config Ref:</b>	CF_INT_CALL	
Entities				Condition		
UE A	IMS A	IMS B	UE B			
✓	✓			UE A registered in IMS A		
		✓	✓	UE B registered in IMS B		
✓			✓	UE A has received 180 on initial request for dialog from UE B		
		✓		IMS B configured for topology hiding		
UE A	IMS A	IMS B	UE B			
Step	Direction			Message	IF	
1			↵	↵	200 response addressed to UE A	
2		↵	↵		<b>200 response</b> <ul style="list-style-type: none"> <li>✓ a Via header <ul style="list-style-type: none"> <li>→ the IBCF SIP URI of IMS A</li> </ul> </li> <li>✓ encrypted consecutive header entries</li> <li>✓ a tokenized-by parameter</li> </ul>	

Test Purpose						
<b>Identifier:</b>	TP IMS 5137_04					
<b>Summary:</b>	The IBCF shall perform encryption for topology hiding before an initial REGISTER request is sent					
<b>IUT Role:</b>	IMS A					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clauses 5.10.4.1 and 5.10.4.2 ¶1 (1 <sup>st</sup> numbered list)			<b>Config Ref:</b>	CF_ROAM_REG	
Entities				Condition		
UE B	IMS A	IMS B				
	✓		IMS A configured for topology hiding			
UE B	IMS A	IMS B				
Step	Direction			Message	IF	
1	↵	↵			unprotected REGISTER addressed to IMS B	
2		↵	↵		<b>REGISTER</b> <ul style="list-style-type: none"> <li>✓ a Via header <ul style="list-style-type: none"> <li>→ the IBCF SIP URI of IMS A</li> </ul> </li> <li>✓ encrypted consecutive header entries</li> <li>✓ a tokenized-by parameter</li> <li>✓ a Route header <ul style="list-style-type: none"> <li>→ the IBCF SIP URI of IMS A</li> </ul> </li> <li>✓ encrypted consecutive header entries</li> <li>✓ a tokenized-by parameter</li> <li>✓ a Path header <ul style="list-style-type: none"> <li>→ the IBCF SIP URI of IMS A</li> </ul> </li> <li>✓ encrypted consecutive header entries</li> <li>✓ a tokenized-by parameter</li> </ul>	

Test Purpose						
<b>Identifier:</b>	TP IMS_5404_01					
<b>Summary:</b>	IBCF shall remove P-Charging-Function-Addresses header from initial INVITE request					
<b>IUT Role:</b>	IMS A					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.10.2.2 ¶1 (item 8 in 1 <sup>st</sup> numbered list)			<b>Config Ref:</b>	CF_INT_CALL	
Entities				Condition		
UE A	IMS A	IMS B	UE B			
✓	✓			UE A registered in IMS A		
		✓	✓	UE B registered in IMS B		
	✓			IMS A configured for topology hiding		
UE A	IMS A	IMS B	UE B			
Step	Direction			Message	IF	
1	↵	⇒		initial INVITE addressed to UE B ✓ a P-Charging-Function-Addresses header		
2		↵	⇒	initial INVITE * a P-Charging-Function-Addresses header		

Test Purpose						
<b>Identifier:</b>	TP IMS_5408_01					
<b>Summary:</b>	The IBCF shall perform encryption for topology hiding before ACK request is sent					
<b>IUT Role:</b>	IMS A					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.10.2.3 ¶1 (item 4 in 1 <sup>st</sup> numbered list )			<b>Config Ref:</b>	CF_INT_CALL	
Entities				Condition		
UE A	IMS A	IMS B	UE B			
✓	✓			UE A registered in IMS A		
		✓	✓	UE B registered in IMS B		
✓			✓	UE A has received 200OK on initial request for dialog from UE B		
	✓			IMS A configured for topology hiding		
UE A	IMS A	IMS B	UE B			
Step	Direction			Message	IF	
1	↵	⇒		ACK addressed to UE B		
2		↵	⇒	ACK <ul style="list-style-type: none"> <li>✓ a Via header <ul style="list-style-type: none"> <li>➔ the IBCF SIP URI of IMS A</li> </ul> </li> <li>✓ encrypted consecutive header entries</li> <li>✓ a tokenized-by parameter</li> <li>✓ a Route header <ul style="list-style-type: none"> <li>➔ the IBCF SIP URI of IMS A</li> </ul> </li> <li>✓ encrypted consecutive header entries</li> <li>✓ a tokenized-by parameter</li> </ul>		

Test Purpose					
<b>Identifier:</b>	TP_IMS_5408_02				
<b>Summary:</b>	The IBCF shall perform encryption for topology hiding before CANCEL request is sent				
<b>IUT Role:</b>	IMS A				
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.10.2.3 ¶1 (item 4 in 1 <sup>st</sup> numbered list)		<b>Config Ref:</b>	CF_INT_CALL	
Entities				Condition	
UE A	IMS A	IMS B	UE B		
✓	✓			UE A registered in IMS A	
		✓	✓	UE B registered in IMS B	
✓			✓	UE B has received 180 on initial request for dialog from UE A	
	✓			IMS A configured for topology hiding	
UE A	IMS A	IMS B	UE B		
Step	Direction			Message	IF
1	↵	↗		CANCEL addressed to UE B	
2		↵	↗	<b>CANCEL</b> <ul style="list-style-type: none"> <li>✓ a Via header <ul style="list-style-type: none"> <li>→ the IBCF SIP URI of IMS A</li> </ul> </li> <li>✓ encrypted consecutive header entries</li> <li>✓ a tokenized-by parameter</li> <li>✓ a Route header <ul style="list-style-type: none"> <li>→ the IBCF SIP URI of IMS A</li> </ul> </li> <li>✓ encrypted consecutive header entries</li> <li>✓ a tokenized-by parameter</li> </ul>	

Test Purpose					
<b>Identifier:</b>	TP_IMS_5408_03				
<b>Summary:</b>	The IBCF shall perform encryption for topology hiding before BYE request is sent				
<b>IUT Role:</b>	IMS A				
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.10.2.3 ¶1 (item 4 in 1 <sup>st</sup> numbered list)		<b>Config Ref:</b>	CF_INT_CALL	
Entities				Condition	
UE A	IMS A	IMS B	UE B		
✓	✓			UE A registered in IMS A	
		✓	✓	UE B registered in IMS B	
✓			✓	UE A has initiated a dialog with UE B	
	✓			IMS A configured for topology hiding	
UE A	IMS A	IMS B	UE B		
Step	Direction			Message	IF
1	↵	↗		BYE addressed to UE B	
2		↵	↗	<b>BYE</b> <ul style="list-style-type: none"> <li>✓ a Via header <ul style="list-style-type: none"> <li>→ the IBCF SIP URI of IMS A</li> </ul> </li> <li>✓ encrypted consecutive header entries</li> <li>✓ a tokenized-by parameter</li> <li>✓ a Route header <ul style="list-style-type: none"> <li>→ the IBCF SIP URI of IMS A</li> </ul> </li> <li>✓ encrypted consecutive header entries</li> <li>✓ a tokenized-by parameter</li> </ul>	

Test Purpose						
<b>Identifier:</b>	<b>TP_IMS_5408_04</b>					
<b>Summary:</b>	The IBCF shall perform encryption for topology hiding before subsequent INVITE request is sent					
<b>IUT Role:</b>	IMS A					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.10.2.3 ¶1 (item 4 in 1 <sup>st</sup> numbered list)			<b>Config Ref:</b>	CF_INT_CALL	
<b>Entities</b>				<b>Condition</b>		
	<b>UE A</b>	<b>IMS A</b>	<b>IMS B</b>	<b>UE B</b>		
	✓	✓			UE A registered in IMS A	
			✓	✓	UE B registered in IMS B	
	✓			✓	UE A has initiated a dialog with UE B	
		✓			IMS A configured for topology hiding	
	<b>UE A</b>	<b>IMS A</b>	<b>IMS B</b>	<b>UE B</b>		
<b>Step</b>	<b>Direction</b>			<b>Message</b>		<b>IF</b>
<b>1</b>	↵	↶			subsequent INVITE addressed to UE B	
<b>2</b>		↵	↶		<b>subsequent INVITE</b> <ul style="list-style-type: none"> <li>✓ a Via header <ul style="list-style-type: none"> <li>→ the IBCF SIP URI of IMS A</li> </ul> </li> <li>✓ encrypted consecutive header entries</li> <li>✓ a tokenized-by parameter</li> <li>✓ a Route header <ul style="list-style-type: none"> <li>→ the IBCF SIP URI of IMS A</li> </ul> </li> <li>✓ encrypted consecutive header entries</li> <li>✓ a tokenized-by parameter</li> </ul>	

Test Purpose						
<b>Identifier:</b>	<b>TP_IMS_5414_01</b>					
<b>Summary:</b>	When IBCF receives an initial INVITE request and it shall respond with a 100 (Trying) provisional response					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.10.3.2 ¶12 (item 1 in 1 <sup>st</sup> numbered list)			<b>Config Ref:</b>	CF_INT_CALL	
<b>Entities</b>				<b>Condition</b>		
	<b>UE A</b>	<b>IMS A</b>	<b>IMS B</b>	<b>UE B</b>		
	✓	✓			UE A registered in IMS A	
			✓	✓	UE B registered in IMS B	
			✓		IMS B configured for topology hiding	
	<b>UE A</b>	<b>IMS A</b>	<b>IMS B</b>	<b>UE B</b>		
<b>Step</b>	<b>Direction</b>			<b>Message</b>		<b>IF</b>
<b>1</b>		↵	↶		initial INVITE addressed to UE B	
<b>2</b>		↵	↶		100 response	

Test Purpose						
<b>Identifier:</b>	<b>TP_IMS_CONTENT_SHARE_01</b>					
<b>Summary:</b>	The IBCF shall pass content share specific information in the OPTIONS request					
<b>IUT Role:</b>	IMS A					
<b>References:</b>	Rich Communication Suite Release 2, Technical realization [7], clause 8.1			<b>Config Ref:</b>	CF_INT_CALL	
<b>Entities</b>				<b>Condition</b>		
	<b>UE A</b>	<b>IMS A</b>	<b>IMS B</b>	<b>UE B</b>		
	✓	✓			UE A registered in IMS A	
			✓	✓	UE B registered in IMS B	
	✓			✓	UE A has initiated a dialog with UE B	
	<b>UE A</b>	<b>IMS A</b>	<b>IMS B</b>	<b>UE B</b>		
<b>Step</b>	<b>Direction</b>			<b>Message</b>		<b>IF</b>
<b>1</b>	↵	↶			OPTIONS addressed to UE B	
<b>2</b>		↵	↶		<b>OPTIONS</b> <ul style="list-style-type: none"> <li>✓ a Contact header <ul style="list-style-type: none"> <li>→ +g.3gpp.cs-voice feature tag</li> </ul> </li> <li>✓ a Accept-Contact header <ul style="list-style-type: none"> <li>→ +g.3gpp.cs-voice feature tag</li> </ul> </li> </ul>	





## 5.5 Messaging Procedures

### 5.5.1 Messaging at P-CSCF

Test Purpose						
<b>Identifier:</b>	TP_IMS_5050_01					
<b>Summary:</b>	When the P-CSCF receives a MESSAGE request from a UE for which a Service-Route header list exists without topology hiding					
<b>IUT Role:</b>	IMS A					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.2.6.3.3 ¶(1 <sup>st</sup> numbered list)			<b>Config Ref:</b>	CF_ROAM_CALL	
Entities				Condition		
UE A	IMS A	IMS B	UE B			
✓	✓			UE A registered in IMS A		
		✓	✓	UE B registered in IMS B		
	x			IMS A not configured for topology hiding		
UE A	IMS A	IMS B	UE B			
Step	Direction			Message	IF	
1		↔		↔	MESSAGE	
2		↔		↔	<b>MESSAGE</b> ✓ a Route header →    the P-CSCF SIP URI of IMS A → the list of Service Route header URIs from registration * a P-Preferred-Identity header ✓ P-Asserted-Identity header ✓ an address of UE A ✓ the P-Charging-Vector header ✓ an icid-value parameter	

### 5.5.2 Messaging at S-CSCF

Test Purpose						
<b>Identifier:</b>	TP_IMS_5097_05					
<b>Summary:</b>	S-CSCF must insert orig-ioi parameter, remove access-network-charging-info parameter before sending MESSAGE over NNI					
<b>IUT Role:</b>	IMS A					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶1			<b>Config Ref:</b>	CF_INT_CALL	
Entities				Condition		
UE A	IMS A	IMS B	UE B			
✓	✓			UE A registered in IMS A		
		✓	✓	UE B registered in IMS B		
	x			IMS A not configured for topology hiding		
UE A	IMS A	IMS B	UE B			
Step	Direction			Message	IF	
1		↔		↔	MESSAGE addressed to UE B	
2		↔		↔	<b>MESSAGE</b> * a Route header → the S-CSCF SIP URI of IMS A ✓ a P-Charging-Vector header ✓ an icid-value parameter ✓ an orig-ioi parameter → IMS A * an access-network-charging-info parameter * a term-ioi parameter	

Test Purpose						
<b>Identifier:</b>	<b>TP IMS 5097_06</b>					
<b>Summary:</b>	S-CSCF inserts a second P-Asserted-Identity header indicating a tel URI					
<b>IUT Role:</b>	IMS A					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶11 (item 9 in 1 <sup>st</sup> numbered list)		<b>Config Ref:</b>	CF_INT_CALL		
Entities				Condition		
	UE A	IMS A	IMS B	UE B		
	✓	✓			UE A registered in IMS A	
			✓	✓	UE B registered in IMS B	
	✓				UE A registered public identities containing a SIP URI	
	UE A	IMS A	IMS B	UE B		
Step	Direction				Message	IF
1	↵	↶			MESSAGE addressed to UE B	
2		↵	↶		<b>MESSAGE</b> ✓ a P-Asserted-Identity header → the SIP URI of UE A ✓ a P-Asserted-Identity header → the Tel URI of UE A	

Test Purpose						
<b>Identifier:</b>	<b>TP IMS 5097_07</b>					
<b>Summary:</b>	S-CSCF inserts a second P-Asserted-Identity header indicating a SIP URI					
<b>IUT Role:</b>	IMS A					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶11 (item 9 in 1 <sup>st</sup> numbered list)		<b>Config Ref:</b>	CF_INT_CALL		
Entities				Condition		
	UE A	IMS A	IMS B	UE B		
	✓	✓			UE A registered in IMS A	
			✓	✓	UE B registered in IMS B	
	✓				UE A registered public identities containing a Tel URI	
	UE A	IMS A	IMS B	UE B		
Step	Direction				Message	IF
1	↵	↶			MESSAGE addressed to UE B	
2		↵	↶		<b>MESSAGE</b> ✓ a P-Asserted-Identity header → the SIP URI of UE A ✓ a P-Asserted-Identity header → the Tel URI of UE A	

Test Purpose						
<b>Identifier:</b>	TP_IMS_5097_08					
<b>Summary:</b>	S-CSCF uses ENUM/DNS to translate Tel URIs to SIP URIs in MESSAGE requests					
<b>IUT Role:</b>	IMS A					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶11 (item 10 in 1 <sup>st</sup> numbered)			<b>Config Ref:</b>	CF_INT_CALL	
Entities					Condition	
UE A	IMS A	ENUM_DB	IMS B	UE B		
✓	✓				UE A registered in IMS A	
			✓	✓	UE B registered in IMS B	
		✓		✓	ENUM_DB configured with an ENUM entry for Tel URI E.164 Number of UE B	
UE A	IMS A	ENUM_DB	IMS B	UE B		
Step	Direction				Message	IF
1	↵	↶			MESSAGE addressed to UE B ✓ a Request URI → a Tel URI	
2		↵	↶		NAPTR Query ✓ the Tel URI E.164 Number	
3		↶	↵		NAPTR Response ✓ NAPTR Resource Record → the SIP URI of UE B	
4		↵		↶	MESSAGE addressed to UE B ✓ a Request URI → a SIP URI of UE B ✓ a P-Charging-Vector header * an access-network-charging-info parameter	

Test Purpose						
<b>Identifier:</b>	TP_IMS_5097_10					
<b>Summary:</b>	MESSAGE handling by S-CSCF with matching filter criteria AS					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶11 (item 5 and 8 in 1 <sup>st</sup> numbered list)			<b>Config Ref:</b>	CF_ROAM_AS	
Entities					Condition	
UE A	IMS A	IMS B	AS B	UE B		
✓	✓				UE A registered in IMS A	
		✓		✓	UE B registered in IMS B	
	✓			✓	UE B visiting IMS A	
		✓	✓		IMS B configured with filter criteria to contact AS B	
		✓	✓		AS B within the trust domain of IMS B	
UE A	IMS A	IMS B	AS B	UE B		
Step	Direction				Message	IF
1		↵	↶		MESSAGE addressed to UE A	
2			↵	↶	MESSAGE ✓ a Route header → the SIP URI of AS B ✓ a P-Charging-Function-Addresses header ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter ✓ an orig-ioi parameter → IMS A	

Test Purpose						
<b>Identifier:</b>	TP_IMS_5108_01					
<b>Summary:</b>	Standalone request; terminated at the served user					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶5 (1 <sup>st</sup> numbered list)			<b>Config Ref:</b>	CF_ROAM_CALL	
Entities				Condition		
UE A	IMS A	IMS B	UE B			
✓	✓			UE A registered in IMS A		
		✓	✓	UE B registered in IMS B		
UE A	IMS A	IMS B	UE B			
Step	Direction			Message	IF	
1		↵	⇒	INVITE addressed to UE B ✓ a P-Charging-Vector header ✓ an icid-value parameter		
2		↵	↵	INVITE ✓ Route header →   the S-CSCF SIP URI of IMS B ✓ a P-Charging-Vector header ✓ the same icid-value parameter * ioi parameters ✓ a Record-Route header ✓ the S-CSCF SIP URI of IMS B		

Test Purpose						
<b>Identifier:</b>	TP_IMS_5108_02					
<b>Summary:</b>	Standalone request; terminated at the served user					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶5 (1 <sup>st</sup> numbered list)			<b>Config Ref:</b>	CF_ROAM_CALL	
Entities				Condition		
UE A	IMS A	IMS B	UE B			
✓	✓			UE A registered in IMS A		
		✓	✓	UE B registered in IMS B		
UE A	IMS A	IMS B	UE B			
Step	Direction			Message	IF	
1		↵	⇒	MESSAGE addressed to UE B ✓ a P-Charging-Vector header ✓ an icid-value parameter		
2		↵	↵	MESSAGE ✓ Route header →   the S-CSCF SIP URI of IMS B ✓ a P-Charging-Vector header ✓ the same icid-value parameter * ioi parameters ✓ a Record-Route header ✓ the S-CSCF SIP URI of IMS B		

Test Purpose						
<b>Identifier:</b>	TP_IMS_5108_06					
<b>Summary:</b>	S-CSCF rejects barred users on MESSAGE					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶16 (item 1 in 1 <sup>st</sup> numbered list)			<b>Config Ref:</b>	CF_INT_CALL	
Entities				Condition		
UE A	IMS A	IMS B	UE B			
✓	✓			UE A registered in IMS A		
		✓	✓	UE B registered in IMS B		
		✓	✓	UE B barred user in IMS B		
UE A	IMS A	IMS B	UE B			
Step	Direction			Message	IF	
1		↵	⇨	MESSAGE addressed to UE B ✓ a Request URI → a barred user in IMS B		
2		⇨	↵	404 response		

Test Purpose						
<b>Identifier:</b>	TP_IMS_5117_01					
<b>Summary:</b>	S-CSCF remove access-network-charging-info parameter from 1xx response to standalone transaction					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶100 (item 2 in 5 <sup>th</sup> numbered list)			<b>Config Ref:</b>	CF_INT_CALL	
Entities				Condition		
UE A	IMS A	IMS B	UE B			
✓	✓			UE A registered in IMS A		
		✓	✓	UE B registered in IMS B		
			✓	UE B has received a standalone request		
UE A	IMS A	IMS B	UE B			
Step	Direction			Message	IF	
1			⇨	1xx response addressed to UE A		
2		⇨	↵	1xx response ✓ a P-Charging-Vector header * an access-network-charging-info parameter		

Test Purpose						
<b>Identifier:</b>	TP_IMS_5117_02					
<b>Summary:</b>	S-CSCF remove access-network-charging-info parameter from 2xx response to standalone transaction					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶100 (item 2 in 5 <sup>th</sup> numbered list)			<b>Config Ref:</b>	CF_INT_CALL	
Entities				Condition		
UE A	IMS A	IMS B	UE B			
✓	✓			UE A registered in IMS A		
		✓	✓	UE B registered in IMS B		
			✓	UE B has received a standalone request		
UE A	IMS A	IMS B	UE B			
Step	Direction			Message	IF	
1			⇨	2xx response addressed to UE A		
2		⇨	↵	2xx response ✓ a P-Charging-Vector header * an access-network-charging-info parameter		

Test Purpose						
<b>Identifier:</b>	TP_IMS_5117_05					
<b>Summary:</b>	S-CSCF inserts a second P-Asserted-Identity header in 1xx response from UE for initial request indicating a registered SIP URI if not present					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶(item 1 in 5 <sup>th</sup> numbered list)			<b>Config Ref:</b>	CF_INT_CALL	
Entities				Condition		
	UE A	IMS A	IMS B	UE B		
	✓	✓			UE A registered in IMS A	
			✓	✓	UE B registered in IMS B	
				✓	UE B registered_public_identities containing a Tel_URI and a SIP_URI	
	✓			✓	UE B has received a standalone request from UE A	
	UE A	IMS A	IMS B	UE B		
<b>Step</b>	Direction			Message		<b>IF</b>
<b>1</b>			↔	↔	1xx response addressed to UE A	
<b>2</b>		↔	↔		<b>1xx response</b> ✓ a P-Asserted-Identity header → the tel URI of UE B ✓ a P-Asserted-Identity header → a SIP URI of UE B	

Test Purpose						
<b>Identifier:</b>	TP_IMS_5117_06					
<b>Summary:</b>	S-CSCF inserts a second P-Asserted-Identity header in 2xx response from UE for initial request indicating a registered SIP URI if not present					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶100 (item 1 in 5 <sup>th</sup> numbered list)			<b>Config Ref:</b>	CF_INT_CALL	
Entities				Condition		
	UE A	IMS A	IMS B	UE B		
	✓	✓			UE A registered in IMS A	
			✓	✓	UE B registered in IMS B	
				✓	UE B registered_public_identities containing a Tel_URI and a SIP_URI	
	✓			✓	UE B has received a standalone request from UE A	
	UE A	IMS A	IMS B	UE B		
<b>Step</b>	Direction			Message		<b>IF</b>
<b>1</b>			↔	↔	2xx response addressed to UE A	
<b>2</b>		↔	↔		<b>2xx response</b> ✓ a P-Asserted-Identity header → the tel URI of UE B ✓ a P-Asserted-Identity header → the SIP URI of UE B	

Test Purpose							
<b>Identifier:</b>	TP_IMS_5118_01						
<b>Summary:</b>	S-CSCF include term-ioi parameter and restores orig-ioi in 200 responses to standalone requests						
<b>IUT Role:</b>	IMS B						
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶105 (item 2 in 6 <sup>th</sup> numbered list)			<b>Config Ref:</b>	CF_INT_CALL		
Entities				Condition			
UE A	IMS A	IMS B	UE B				
✓	✓			UE A registered in IMS A			
		✓	✓	UE B registered in IMS B			
✓			✓	UE B has received a standalone request from UE A			
UE A	IMS A	IMS B	UE B				
Step	Direction			Message		IF	
1			↵	↵	200 response addressed to UE A		
2		↵	↵		<b>200 response</b> <ul style="list-style-type: none"> <li>✓ a P-Charging-Vector header</li> <li>✓ an orig-ioi parameter <ul style="list-style-type: none"> <li>→ operator identifier of IMS A</li> </ul> </li> <li>✓ a term-ioi parameter <ul style="list-style-type: none"> <li>→ operator identifier of IMS B</li> </ul> </li> </ul>		

## 5.6 Application Server Handling Procedures

### 5.6.1 Application Server Handling at S-CSCF

Test Purpose							
<b>Identifier:</b>	TP_IMS_5097_09						
<b>Summary:</b>	Initial request for a dialog handling by S-CSCF with matching filter criteria AS						
<b>IUT Role:</b>	IMS B						
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶11 (items 5 and 8 in 1 <sup>st</sup> numbered list)			<b>Config Ref:</b>	CF_ROAM_AS		
Entities				Condition			
UE A	IMS A	IMS B	AS B	UE B			
✓	✓				UE A registered in IMS A		
		✓		✓	UE B registered in IMS B		
	✓			✓	UE B visiting IMS A		
		✓	✓		IMS B configured with filter criteria to contact AS B		
		✓	✓		AS B within the trust domain of IMS B		
UE A	IMS A	IMS B	AS B	UE B			
Step	Direction			Message		IF	
1		↵	↵		initial INVITE addressed to UE A		
2			↵	↵	<b>initial INVITE</b> <ul style="list-style-type: none"> <li>✓ a Route header <ul style="list-style-type: none"> <li>→ the SIP URI of AS B</li> </ul> </li> <li>✓ a P-Charging-Function-Addresses header</li> <li>✓ a P-Charging-Vector header <ul style="list-style-type: none"> <li>✓ an orig-ioi parameter <ul style="list-style-type: none"> <li>→ operator identifier of IMS A</li> </ul> </li> <li>× a term-ioi parameter</li> </ul> </li> <li>✓ access-network-charging-info</li> </ul>		





Test Purpose						
<b>Identifier:</b>	TP_IMS_5108_03					
<b>Summary:</b>	Request for a initial dialog terminated at the served user					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶5 (item 4 in 1 <sup>st</sup> numbered list)			<b>Config Ref:</b>	CF_INT_AS	
Entities					Condition	
UE A	IMS A	IMS B	AS B	UE B		
✓	✓				UE A registered in IMS A	
	✓			✓	UE B registered in IMS A	
		✓	✓		IMS B configured with filter criteria to contact AS B	
UE A	IMS A	IMS B	AS B	UE B		
Step	Direction				Message	IF
1		↵	↶		initial INVITE addressed to UE B	
2			↵	↶	<b>INVITE</b> <ul style="list-style-type: none"> <li>✓ a topmost Route header <ul style="list-style-type: none"> <li>→ the SIP URI of AS B</li> </ul> </li> <li>✓ a Route header <ul style="list-style-type: none"> <li>→ the S-CSCF SIP URI of IMS B</li> </ul> </li> <li>✓ a P-Charging-Vector header <ul style="list-style-type: none"> <li>✓ an orig-ioi parameter <ul style="list-style-type: none"> <li>→ operator identifier of IMS A</li> </ul> </li> <li>× a term-ioi parameter</li> </ul> </li> </ul>	

Test Purpose						
<b>Identifier:</b>	TP_IMS_5108_04					
<b>Summary:</b>	Standalone request; terminated at the served user					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶5 (item 4 in 1 <sup>st</sup> numbered list )			<b>Config Ref:</b>	CF_INT_AS	
Entities					Condition	
UE A	IMS A	IMS B	AS B	UE B		
✓	✓				UE A registered in IMS A	
	✓			✓	UE B registered in IMS B	
		✓	✓		IMS B configured with filter criteria to contact AS B	
UE A	IMS A	IMS B	AS B	UE B		
Step	Direction				Message	IF
1		↵	↶		MESSAGE addressed to UE B	
2			↵	↶	<b>MESSAGE</b> <ul style="list-style-type: none"> <li>✓ a topmost Route header <ul style="list-style-type: none"> <li>→ the SIP URI of AS B</li> </ul> </li> <li>✓ a Route header <ul style="list-style-type: none"> <li>→ the S-CSCF SIP URI of IMS B</li> </ul> </li> <li>✓ a P-Charging-Vector header <ul style="list-style-type: none"> <li>✓ an orig-ioi parameter <ul style="list-style-type: none"> <li>→ operator identifier of IMS A</li> </ul> </li> <li>× a term-ioi parameter</li> </ul> </li> </ul>	

Test Purpose						
<b>Identifier:</b>	TP_IMS_5108_07					
<b>Summary:</b>	Request for a initial dialog terminated at the served user (SUBSCRIBE)					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶(item 4 in 1 <sup>st</sup> numbered list)			<b>Config Ref:</b>	CF_INT_AS	
Entities					Condition	
UE A	IMS A	IMS B	AS B	UE B		
✓	✓				UE A registered in IMS A	
	✓			✓	UE B registered in IMS A	
		✓	✓		IMS B configured with filter criteria to contact AS B	
UE A	IMS A	IMS B	AS B	UE B		
Step	Direction				Message	IF
1		↵	↶		SUBSCRIBE addressed to UE B	
2			↵	↶	<b>SUBSCRIBE</b> ✓ a topmost Route header → the SIP URI of AS B ✓ a Route header → the S-CSCF SIP URI of IMS B ✓ a P-Charging-Vector header ✓ an orig-voi parameter → operator identifier of IMS A × a term-voi parameter	

Test Purpose						
<b>Identifier:</b>	TP_IMS_5109_01					
<b>Summary:</b>	S-CSCF returns 408 or 5xx response to initial terminating INVITE when there is no response from AS and filter criterion indicates the value SESSION_TERMINATED					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶76 (after 2 <sup>nd</sup> numbered list)			<b>Config Ref:</b>	CF_INT_CALL CF_ROAM_CALL	
Entities					Condition	
UE A	IMS A	IMS B	AS B	UE B		
✓	✓				UE A registered in IMS A	
				×	UE B not registered	
		✓		✓	IMS B configured with a terminating unregistered filter criterion for UE B indicating SESSION_TERMINATED on INVITE	
UE A	IMS A	IMS B	AS B	UE B		
Step	Direction				Message	IF
1		↵	↶		initial INVITE addressed to UE B	
2a		↶	↵		408 response	
2b		↶	↵		5xx response	

Test Purpose						
<b>Identifier:</b>	TP_IMS_5110_01					
<b>Summary:</b>	Forward 200 from AS on final response to an initial request for a dialog or a standalone request					
<b>IUT Role:</b>	IMS A					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶79 (after 6 <sup>th</sup> dashed list)			<b>Config Ref:</b>	CF_INT_AS CF_ROAM_AS	
Entities					Condition	
UE A	AS A	IMS A	IMS B	UE B		
✓		✓			UE A registered in IMS A	
			✓	✓	UE B registered in IMS B	
	✓	✓			IMS A configured with filter criteria to contact AS A	
✓				✓	UE B has received 180 on initial request for dialog from UE A	
UE A	AS A	IMS A	IMS B	UE B		
Step	Direction				Message	IF
1		↵	↶		200 response addressed to UE B	
2			↵	↶	200 response	

Test Purpose						
<b>Identifier:</b>	TP_IMS_5114_01					
<b>Summary:</b>	S-CSCF should turn down initial dialog request when terminated at the not registered served user					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶85 (item 3 in 3 <sup>rd</sup> numbered list)		<b>Config Ref:</b>		CF_INT_CALL CF_ROAM_CALL	
<b>Entities</b>			<b>Condition</b>			
	<b>UE A</b>	<b>IMS A</b>	<b>IMS B</b>	<b>UE B</b>		
	✓		✓		UE A registered in IMS B	
				x	UE B not registered	
			x		IMS B not configured with filter criteria to contact any AS	
	<b>UE A</b>	<b>IMS A</b>	<b>IMS B</b>	<b>UE B</b>		
<b>Step</b>	<b>Direction</b>			<b>Message</b>		<b>IF</b>
<b>1</b>		↵	⇒		initial INVITE addressed to UE B	
<b>2</b>		↵	⇒		4xx response	

Test Purpose						
<b>Identifier:</b>	TP_IMS_5114_02					
<b>Summary:</b>	S-CSCF should turn down standalone request when terminated at the not registered served user					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶85 (item 3 in 3 <sup>rd</sup> numbered list)		<b>Config Ref:</b>		CF_INT_CALL CF_ROAM_CALL	
<b>Entities</b>			<b>Condition</b>			
	<b>UE A</b>	<b>IMS A</b>	<b>IMS B</b>	<b>UE B</b>		
	✓	✓			UE A registered in IMS A	
				x	UE B not registered	
			x		IMS B not configured with filter criteria to contact any AS	
	<b>UE A</b>	<b>IMS A</b>	<b>IMS B</b>	<b>UE B</b>		
<b>Step</b>	<b>Direction</b>			<b>Message</b>		<b>IF</b>
<b>1</b>		↵	⇒		MESSAGE addressed to UE B	
<b>2</b>		↵	⇒		4xx response	

Test Purpose						
<b>Identifier:</b>	TP_IMS_5115_07					
<b>Summary:</b>	S-CSCF include term-ioi parameter and restores orig-ioi in 1xx responses from AS to initial requests in terminating network					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶89 (4 <sup>th</sup> numbered list)		<b>Config Ref:</b>		CF_ROAM_AS CF_INT_AS	
<b>Entities</b>			<b>Condition</b>			
	<b>UE A</b>	<b>IMS A</b>	<b>IMS B</b>	<b>AS B</b>	<b>UE B</b>	
	✓	✓				UE A registered in IMS A
			✓	✓		IMS B configured with filter criteria to contact AS B
	✓			✓		AS B has received an initial request for a dialog from UE A
	<b>UE A</b>	<b>IMS A</b>	<b>IMS B</b>	<b>AS B</b>	<b>UE B</b>	
<b>Step</b>	<b>Direction</b>			<b>Message</b>		<b>IF</b>
<b>1</b>			↵	⇒		1xx response addressed to UE A
<b>2</b>			↵	⇒		<b>1xx response</b> ✓ a P-Charging-Vector header ✓ an orig-ioi parameter → operator identifier of IMS A ✓ a term-ioi parameter → operator identifier of IMS B



Test Purpose							
<b>Identifier:</b>	TP IMS 5302_01						
<b>Summary:</b>	The S-CSCF shall retain the access-network-charging-info parameter in the P-Charging-Vector header a 1xx or 2xx response to AS						
<b>IUT Role:</b>	IMS B						
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶(after 11 <sup>th</sup> numbered list)			<b>Config Ref:</b>	CF_ROAM_AS CF_INT_AS		
Entities					Condition		
	UE A	IMS A	IMS B	AS B	UE B		
	✓	✓				UE A registered in IMS A	
			✓		✓	UE B registered in IMS B	
	✓				✓	UE B has received a subsequent request in a dialog from UE A	
			✓	✓		IMS B configured with filter criteria to contact AS B	
			✓	✓		AS B within the trust domain of IMS B	
	UE A	IMS A	IMS B	AS B	UE B		
<b>Step</b>	<b>Direction</b>					<b>Message</b>	<b>IF</b>
1		↵	↶			2xx response addressed to UE A	
2			↵	↶		2xx response ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter	

Test Purpose							
<b>Identifier:</b>	TP IMS 5302_02						
<b>Summary:</b>	The S-CSCF receives a 1xx or 2xx response and not AS in same trust domain then it shall remove the access-network-charging-info parameter in the P-Charging-Vector header						
<b>IUT Role:</b>	IMS B						
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶(after 11 <sup>th</sup> numbered list)			<b>Config Ref:</b>	CF_ROAM_AS CF_INT_AS		
Entities					Condition		
	UE A	IMS A	IMS B	AS B	UE B		
	✓	✓				UE A registered in IMS A	
			✓		✓	UE B registered in IMS B	
	✓				✓	UE B has received a subsequent request in a dialog from UE A	
			✓	✓		IMS B configured with filter criteria to contact AS B	
				x		AS B not within the trust domain	
	UE A	IMS A	IMS B	AS B	UE B		
<b>Step</b>	<b>Direction</b>					<b>Message</b>	<b>IF</b>
1		↵	↶			2xx response addressed to UE A	
2			↵	↶		2xx response ✓ a P-Charging-Vector header x an access-network-charging-info parameter	

Test Purpose (TO BE REVISITED)					
<b>Identifier:</b>	TP_IMS_5206_01				
<b>Summary:</b>	REGISTER request if there is at least on AS that matches Filter Criteria				
<b>IUT Role:</b>	IMS B				
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.1.2.2F ¶15 (before note 3)		<b>Config Ref:</b>		CF_ROAM_AS
Entities			Condition		
IMS B	AS B	UE B			
	✓	✓	UE B configured with filter criteria to contact AS B		
✓		✓	IMS B has challenged with a 401 response the REGISTER request of UE B		
IMS B	AS B	UE B			
Step	Direction		Message		IF
1	↵	↵	<b>protected REGISTER</b> ✓ an Authorization header ✓ an integrity-protected parameter set on (yes or tls-pending or tls-yes or ip-assoc-pending or ip-assoc-yes)		
2	↵	↵	<b>third party REGISTER</b> ✓ a P-Access-Network-Info header ✓ a P-Visited-Network-ID header		
3	↵	↵	<b>200 response</b>		

Test Purpose					
<b>Identifier:</b>	TP_IMS_5308_01				
<b>Summary:</b>	Retain the access-network-charging-info parameter from the P-Charging-Vector header in 180 to AS				
<b>IUT Role:</b>	IMS A				
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.4.2.2 ¶12		<b>Config Ref:</b>		CF_INT_AS CF_ROAM_AS
Entities			Condition		
UE A	AS A	IMS A	IMS B	UE B	
✓		✓			UE A registered in IMS A
			✓	✓	UE B registered in IMS B
	✓	✓			IMS A configured with filter criteria to contact AS A
	✓			✓	AS A has received an initial request for a dialog from UE B
UE A	AS A	IMS A	IMS B	UE B	
Step	Direction		Message		IF
1	↵	↵			<b>180 response</b> ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter
2	↵	↵			<b>180 response</b> ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter

Test Purpose							
<b>Identifier:</b>	TP_IMS_5308_02						
<b>Summary:</b>	Retain the access-network-charging-info parameter from the P-Charging-Vector header in 200 to AS						
<b>IUT Role:</b>	IMS A						
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.4.2.2 ¶2			<b>Config Ref:</b>	CF_INT_AS CF_ROAM_AS		
Entities					Condition		
	UE A	AS A	IMS A	IMS B	UE B		
	✓		✓			UE A registered in IMS A	
				✓	✓	UE B registered in IMS B	
		✓	✓			IMS A configured with filter criteria to contact AS A	
		✓			✓	AS A has received 180 on initial request for dialog from UE B	
	UE A	AS A	IMS A	IMS B	UE B		
Step	Direction					Message	IF
1	↵		↵			<b>200 response</b> ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter	
2		↵	↵			<b>200 response</b> ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter	

Test Purpose							
<b>Identifier:</b>	TP_IMS_5310_01						
<b>Summary:</b>	Retaining the access-network-charging-info parameter from the P-Charging-Vector						
<b>IUT Role:</b>	IMS B						
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.6.1.2 ¶1			<b>Config Ref:</b>	CF_ROAM_AS		
Entities					Condition		
	UE A	IMS A	IMS B	AS B	UE B		
	✓	✓				UE A registered in IMS A	
			✓		✓	UE B registered in IMS B	
	✓				✓	UE B has initiated a dialog with UE A	
			✓	✓		IMS B configured with filter criteria to contact AS B	
				✓		AS B is within the trust domain of IMS B	
	UE A	IMS A	IMS B	AS B	UE B		
Step	Direction					Message	IF
1		↵	↵			<b>subsequent INVITE</b> ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter	
2			↵	↵		<b>INVITE</b> ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter	



Test Purpose							
<b>Identifier:</b>	TP_IMS_5310_02						
<b>Summary:</b>	Not retaining the access-network-charging-info parameter from the P-Charging-Vector						
<b>IUT Role:</b>	IMS B						
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.6.1.2 ¶1			<b>Config Ref:</b>		CF_ROAM_AS	
Entities					Condition		
UE A	IMS A	IMS B	AS B	UE B			
✓	✓				UE A registered in IMS A		
		✓		✓	UE B registered in IMS B		
✓				✓	AS B has initiated a dialog with UE A		
		✓	✓		IMS B configured with filter criteria to contact AS B		
			x		AS B is not within the trust domain of IMS B		
UE A	IMS A	IMS B	AS B	UE B			
Step	Direction				Message		IF
1		↵	⇒		<b>subsequent INVITE</b> ✓ P-Charging-Vector header ✓ an access-network-charging-info parameter		
2			↵	⇒	<b>INVITE</b> ✓ a P-Charging-Vector header x✓ an access-network-charging-info parameter		

Test Purpose							
<b>Identifier:</b>	TP_IMS_5310_03						
<b>Summary:</b>	Retaining in UPDATE the access-network-charging-info parameter from the P-Charging-Vector						
<b>IUT Role:</b>	IMS B						
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.6.1.2 ¶1			<b>Config Ref:</b>		CF_ROAM_AS	
Entities					Condition		
UE A	IMS A	IMS B	AS B	UE B			
✓	✓				UE A registered in IMS A		
		✓		✓	UE B registered in IMS B		
✓				✓	UE B has initiated a dialog with UE A		
		✓	✓		IMS B configured with filter criteria to contact AS B		
			✓		AS B is within the trust domain of IMS B		
UE A	IMS A	IMS B	AS B	UE B			
Step	Direction				Message		IF
1		↵	⇒		<b>subsequent UPDATE</b> ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter		
2			↵	⇒	<b>UPDATE</b> ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter		

Test Purpose							
<b>Identifier:</b>	TP_IMS_5310_04						
<b>Summary:</b>	Not retaining in UPDATE the access-network-charging-info parameter from the P-Charging-Vector						
<b>IUT Role:</b>	IMS B						
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.6.1.2 ¶1			<b>Config Ref:</b>		CF_ROAM_AS	
Entities					Condition		
	UE A	IMS A	IMS B	AS B	UE B		
	✓	✓				UE A registered in IMS A	
			✓		✓	UE B registered in IMS B	
	✓				✓	UE B has initiated a dialog with UE A	
			✓	✓		IMS B configured with filter criteria to contact AS B	
				x		AS B is not within the trust domain of IMS B	
	UE A	IMS A	IMS B	AS B	UE B		
Step	Direction					Message	IF
1		↵	⇒			<b>subsequent UPDATE</b> ✓ P-Charging-Vector header ✓ an access-network-charging-info parameter	
2			↵	⇒		<b>UPDATE</b> ✓ a P-Charging-Vector header ✗ an access-network-charging-info parameter	

Test Purpose							
<b>Identifier:</b>	TP_IMS_5312_01						
<b>Summary:</b>	Retaining the access-network-charging-info parameter from the P-Charging-Vector on 200 (OK) response						
<b>IUT Role:</b>	IMS B						
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.6.1.3 ¶1			<b>Config Ref:</b>		CF_ROAM_AS CF_INT_AS	
Entities					Condition		
	UE A	IMS A	IMS B	AS B	UE B		
	✓	✓				UE A registered in IMS A	
			✓		✓	UE B registered in IMS B	
	✓				✓	UE B has initiated a dialog with UE A	
			✓	✓		IMS B configured with filter criteria to contact AS B	
	✓				✓	UE B having sent subsequent INVITE or UPDATE to UE A	
	UE A	IMS A	IMS B	AS B	UE B		
Step	Direction					Message	IF
1		↵	⇒			<b>200 response</b> addressed to UE B ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter	
2			↵	⇒		<b>200 response</b> ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter	

Test Purpose							
<b>Identifier:</b>	TP_IMS_5313_01						
<b>Summary:</b>	Retaining the access-network-charging-info parameter from the P-Charging-Vector on any SIP request						
<b>IUT Role:</b>	IMS B						
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.6.1.3 ¶2			<b>Config Ref:</b>		CF_INT_AS CF_ROAM_AS	
Entities					Condition		
UE A	AS A	IMS A	IMS B	UE B			
✓		✓			UE A registered in IMS B		
			✓	✓	UE B registered in IMS B		
	✓	✓			IMS A configured with filter criteria to contact AS A		
	✓			✓	AS A has initiated a dialog with UE B		
	✓				AS A is within the trust domain of IMS A		
UE A	AS A	IMS A	IMS B	UE B			
Step	Direction				Message		IF
1			⇌	⇌	<b>a response</b> ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter		
2		⇌	⇌		<b>The response</b> ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter		

Test Purpose							
<b>Identifier:</b>	TP_IMS_5313_02						
<b>Summary:</b>	Not retaining the access-network-charging-info parameter from the P-Charging-Vector on any SIP request						
<b>Clause:</b>							
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.6.1.3 ¶2			<b>Config Ref:</b>		CF_INT_AS	
<b>IUT Role:</b>	IMS A			<b>Test Case:</b>		TC_IMS_5313_02	
Entities					Condition		
UE A	AS A	IMS A	IMS B	UE B			
✓		✓			UE A registered in IMS A		
			✓	✓	UE B registered in IMS B		
	✓	✓			IMS A configured with filter criteria to contact AS A		
	✓			✓	AS A has initiated a dialog with UE B		
	x				AS A is not within the trust domain of IMS A		
UE A	AS A	IMS A	IMS B	UE B			
Step	Direction				Message		IF
1			⇌	⇌	<b>a response</b> ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter		
2		⇌	⇌		<b>the response</b> ✓ a P-Charging-Vector header * access-network-charging-info parameter		

Test Purpose						
<b>Identifier:</b>	TP IMS 5320_01					
<b>Summary:</b>	S-CSCF is failing to receive a SIP response or receive 408 (Request Timeout) response or a 5xx response from the AS					
<b>IUT Role:</b>	IMS B					
<b>References:</b>	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶91 (after note 15)			<b>Config Ref:</b>	CF_ROAM_AS CF_INT_AS	
Entities			Condition			
	UE A	IMS A	IMS B	AS B	UE B	
	✓	✓				UE A registered in IMS A
			✓		✓	UE B registered in IMS B
				✓	✓	AS B has received an initial request for a dialog from UE B
			✓	✓		AS B filter criteria default handling in IMS B set to SESSION TERMINATED
	UE A	IMS A	IMS B	AS B	UE B	
<b>Step</b>	Direction			Message		<b>IF</b>
1			⇐	⇒		Any response
2a			⇐		⇒	408 response
2b			⇐		⇒	5xx response

## 5.7 MGCF tests for IMS-PSTN interconnection

Test Purpose						
<b>Identifier:</b>	TP IMS MGCF_01					
<b>Summary:</b>	MGCF shall send INVITE due to indication of an incoming call					
<b>Clause:</b>	TS 124 229 [1], clause 5.5.3.1.1					
<b>References:</b>	RQ_24.229_5.5.3.1.1			<b>Config Ref:</b>	CF_PSTN	
<b>IUT Role:</b>	MGCF			<b>Test Case:</b>	TC_IMS_MGCF_01	
Entities			Condition			
	IMS_A	IUT	PSTN			
	✓		✓			IMS A and PSTN with peer-to-peer arrangement
	IMS_A	IUT	PSTN			
<b>Step</b>	Direction			Message		<b>IF</b>
1			⇐	⇒		initial IAM
2		⇐	⇒			<b>INVITE</b> ✓ a Request URI → Tel URI E.164 Number or (Sip URI E.164 Number with user portion phone) ✓ a Contact header → anyvalue GRUU format ✓ a Supported header ✓ an 100rel value ✓ a P-Asserted-Identity header ✓ a P-Charging-Vector header → an icid-value parameter ✓ a SDP → codec supported curr precondition

Test Purpose						
<b>Identifier:</b>	TP IMS MGCF_02					
<b>Summary:</b>	MGCF shall send 100 response due to indication of an incoming INVITE					
<b>Clause:</b>	TS 124 229 [1], clause 5.5.3.1.2					
<b>References:</b>	RQ_24.229_5.5.3.1.2			<b>Config Ref:</b>	CF_PSTN	
<b>IUT Role:</b>	MGCF			<b>Test Case:</b>	TC_IMS_MGCF_02	
Entities			Condition			
	IMS_A	IUT	PSTN			
	✓		✓			IMS A and PSTN with peer-to-peer arrangement
	IMS_A	IUT	PSTN			
<b>Step</b>	Direction			Message		<b>IF</b>
1		⇐	⇒			initial INVITE
2		⇐	⇒			100 response



Test Purpose					
<b>Identifier:</b>	<b>TP_IMS_MGCF_08</b>				
<b>Summary:</b>	MGCF shall send BYE response due to indication of release				
<b>Clause:</b>	TS 129 163 [6], clause 7.2.3.1.8, TS 124 229 [1], clause 5.5.4.1				
<b>References:</b>	RQ_29.163_7.2.3.1.8		<b>Config Ref:</b>	CF_PSTN	
<b>IUT Role:</b>	MGCF		<b>Test Case:</b>	TC_IMS_MGCF_08	
	Entities			Condition	
	IMS_A	IUT	PSTN		
	✓		✓	IMS A and PSTN with peer-to-peer arrangement	
	IMS_A	IUT	PSTN		
<b>Step</b>	Direction			Message	<b>IF</b>
1		↔	↔	REL	
2	↔	↔		BYE	

Test Purpose					
<b>Identifier:</b>	<b>TP_IMS_MGCF_09</b>				
<b>Summary:</b>	MGCF shall send 486 response due to indication of release with cause indicator 17				
<b>Clause:</b>	TS 129 163 [6], clause 7.2.3.1.8				
<b>References:</b>	RQ_29.163_7.2.3.1.8		<b>Config Ref:</b>	CF_PSTN	
<b>IUT Role:</b>	MGCF		<b>Test Case:</b>	TC_IMS_MGCF_09	
	Entities			Condition	
	IMS_A	IUT	PSTN		
	✓		✓	IMS A and PSTN with peer-to-peer arrangement	
	IMS_A	IUT	PSTN		
<b>Step</b>	Direction			Message	<b>IF</b>
1		↔	↔	REL → cause17	
2	↔	↔		486 response	

Test Purpose					
<b>Identifier:</b>	<b>TP_IMS_MGCF_10</b>				
<b>Summary:</b>	MGCF shall send REL with cause #17 or #34 with Diagnostic due to 486 Busy here				
<b>Clause:</b>	TS 129 163 [6], clause 7.2.3.2.12				
<b>References:</b>	RQ_29.163_7.2.3.2.12		<b>Config Ref:</b>	CF_PSTN	
<b>IUT Role:</b>	MGCF		<b>Test Case:</b>	TC_IMS_MGCF_10	
	Entities			Condition	
	IMS_A	IUT	PSTN		
	✓		✓	IMS A and PSTN with peer-to-peer arrangement	
	IMS_A	IUT	PSTN		
<b>Step</b>	Direction			Message	<b>IF</b>
1	↔	↔		486 response	
2		↔	↔	REL → cause17 or cause34	

Test Purpose					
<b>Identifier:</b>	<b>TP_IMS_MGCF_11</b>				
<b>Summary:</b>	MGCF shall send CPG with a 'remote hold' Generic notification indicator on receipt of HOLD request from IMS				
<b>Clause:</b>	TS 129 163 [6], clause 7.4.10.1				
<b>References:</b>	RQ_29.163_7.4.10.1		<b>Config Ref:</b>	CF_PSTN	
<b>IUT Role:</b>	MGCF		<b>Test Case:</b>	TC_IMS_MGCF_11	
	Entities			Condition	
	IMS_A	IUT	PSTN		
	✓		✓	IMS A and PSTN with peer-to-peer arrangement	
	✓		✓	IMS A and PSTN call active	
	IMS_A	IUT	PSTN		
<b>Step</b>	Direction			Message	<b>IF</b>
1	↔	↔		UPDATE or a target refresh INVITE ✓ a SDP → sendonly	
2		↔	↔	CPG → remote hold	

Test Purpose					
<b>Identifier:</b>	<b>TP_IMS_MGCF_12</b>				
<b>Summary:</b>	MGCF shall send CPG with a 'remote retrieve' Generic notification indicator on receipt of Resume request from IMS				
<b>Clause:</b>	TS 129 163 [6], clause 7.4.10.1				
<b>References:</b>	RQ_29.163_7.4.10.1	<b>Config Ref:</b>	CF_PSTN		
<b>IUT Role:</b>	MGCF	<b>Test Case:</b>	TC_IMS_MGCF_12		
Entities			Condition		
	<b>IMS_A</b>	<b>IUT</b>	<b>PSTN</b>		
	✓		✓	IMS A and PSTN with peer-to-peer arrangement	
	✓		✓	IMS A and PSTN call on hold	
	<b>IMS_A</b>	<b>IUT</b>	<b>PSTN</b>		
Step	Direction			Message	IF
<b>1</b>	↵	↶		<b>UPDATE</b> or a target refresh INVITE ✓ a SDP → sendrcv	
<b>2</b>		↵	↶	<b>CPG</b> → remote retrieve	

Test Purpose					
<b>Identifier:</b>	<b>TP_IMS_MGCF_13</b>				
<b>Summary:</b>	MGCF shall send CPG with a 'remote hold' Generic notification indicator on receipt of HOLD request from IMS				
<b>Clause:</b>	TS 129 163 [6], clause 7.4.10.2				
<b>References:</b>	RQ_29.163_7.4.10.2	<b>Config Ref:</b>	CF_PSTN		
<b>IUT Role:</b>	MGCF	<b>Test Case:</b>	TC_IMS_MGCF_13		
Entities			Condition		
	<b>IMS_A</b>	<b>IUT</b>	<b>PSTN</b>		
	✓		✓	IMS A and PSTN with peer-to-peer arrangement	
	✓		✓	IMS A and PSTN call active	
	<b>IMS_A</b>	<b>IUT</b>	<b>PSTN</b>		
Step	Direction			Message	IF
<b>1</b>		↵	↶	<b>CPG</b> → remote hold	
<b>2</b>	↵	↶		<b>UPDATE</b> or a target refresh INVITE ✓ a SDP → sendonly	

Test Purpose					
<b>Identifier:</b>	<b>TP_IMS_MGCF_14</b>				
<b>Summary:</b>	MGCF shall send CPG with a 'remote retrieve' Generic notification indicator on receipt of Resume request from IMS				
<b>Clause:</b>	TS 129 163 [6], clause 7.4.10.2				
<b>References:</b>	RQ_29.163_7.4.10.2	<b>Config Ref:</b>	CF_PSTN		
<b>IUT Role:</b>	MGCF	<b>Test Case:</b>	TC_IMS_MGCF_14		
Entities			Condition		
	<b>IMS_A</b>	<b>IUT</b>	<b>PSTN</b>		
	✓		✓	IMS A and PSTN with peer-to-peer arrangement	
	✓		✓	IMS A and PSTN call on hold	
	<b>IMS_A</b>	<b>IUT</b>	<b>PSTN</b>		
Step	Direction			Message	IF
<b>1</b>		↵	↶	<b>CPG</b> → remote retrieve	
<b>2</b>	↵	↶		<b>UPDATE</b> or a target refresh INVITE ✓ a SDP → sendonly	

Test Purpose					
<b>Identifier:</b>	<b>TP_IMS_MGCF_15</b>				
<b>Summary:</b>	MGCF shall send ACM/CPG due to indication of a 180 response				
<b>Clause:</b>	TS 129 163 [6], clauses 7.2.3.2.4 and 7.2.3.2.6				
<b>References:</b>	RQ_29.163_7.2.3.2.4_and_6	<b>Config Ref:</b>	CF_PSTN		
<b>IUT Role:</b>	MGCF	<b>Test Case:</b>	TC_IMS_MGCF_15		
	Entities			Condition	
	<b>IMS_A</b>	<b>IUT</b>	<b>PSTN</b>		
	✓		✓	IMS A and PSTN with peer-to-peer arrangement	
	<b>IMS_A</b>	<b>IUT</b>	<b>PSTN</b>		
Step	Direction			Message	IF
<b>1</b>	↵	↶		<b>180 response</b>	
<b>2</b>		↵	↶	<b>ACM</b> → subscriber free <b>or</b> sends a CPG → ALERTING	

Test Purpose					
<b>Identifier:</b>	<b>TP_IMS_MGCF_16</b>				
<b>Summary:</b>	MGCF shall send ANM due to indication of a 200 response				
<b>Clause:</b>	TS 129 163 [6], clause 7.2.3.2.8				
<b>References:</b>	RQ_29.163_7.2.3.2.8	<b>Config Ref:</b>	CF_PSTN		
<b>IUT Role:</b>	MGCF	<b>Test Case:</b>	TC_IMS_MGCF_16		
	Entities			Condition	
	<b>IMS_A</b>	<b>IUT</b>	<b>PSTN</b>		
	✓		✓	IMS A and PSTN with peer-to-peer arrangement	
	<b>IMS_A</b>	<b>IUT</b>	<b>PSTN</b>		
Step	Direction			Message	IF
<b>1</b>	↵	↶		<b>200 response</b>	
<b>2</b>		↵	↶	<b>ANM</b>	

Test Purpose					
<b>Identifier:</b>	<b>TP_IMS_MGCF_17</b>				
<b>Summary:</b>	MGCF shall send REL due to indication of a BYE				
<b>Clause:</b>	TS 129 163 [6], clause 7.2.3.2.13				
<b>References:</b>	RQ_29.163_7.2.3.2.13	<b>Config Ref:</b>	CF_PSTN		
<b>IUT Role:</b>	MGCF	<b>Test Case:</b>	TC_IMS_MGCF_17		
	Entities			Condition	
	<b>IMS_A</b>	<b>IUT</b>	<b>PSTN</b>		
	✓		✓	IMS A and PSTN with peer-to-peer arrangement	
	<b>IMS_A</b>	<b>IUT</b>	<b>PSTN</b>		
Step	Direction			Message	IF
<b>1</b>	↵	↶		<b>BYE</b>	
<b>2</b>		↵	↶	<b>REL</b>	



## 5.8 ENUM tests for Tel-URI Resolution

Test Purpose						
<b>Identifier:</b>	TP_IMS_ENUM_01					
<b>Summary:</b>	The ENUM DB resolves a Tel URI into a SIP URI					
<b>IUT Role:</b>	IMS A					
<b>References:</b>	TS124 229 (V9.5.0) [1], clause 5.4.3.2 ¶11 (item 10 1 <sup>st</sup> numbered list)		<b>Config Ref:</b>		CF_INT_CALL	
<b>Entities</b>			<b>Condition</b>			
	<b>UE A</b>	<b>IMS A</b>	<b>ENUM _DB</b>	<b>IMS B</b>	<b>UE B</b>	
	✓	✓				UE A registered in IMS A
				✓	✓	UE B registered in IMS B
			✓		✓	ENUM_DB configured with an ENUM entry for Tel URI E.164 Number of UE B
	<b>UE A</b>	<b>IMS A</b>	<b>ENUM _DB</b>	<b>IMS B</b>	<b>UE B</b>	
<b>Step</b>	<b>Direction</b>			<b>Message</b>		<b>IF</b>
<b>1</b>	↵	⇒				<b>initial INVITE</b> addressed to UE B ✓ a Request URI → a Tel URI
<b>2</b>		↵	⇒			<b>NAPTR Query</b> ✓ the derived Tel URI E.164 Number
<b>3</b>		↵	⇒			<b>NAPTR Response</b> ✓ NAPTR Resource Record → the TTL of the NAPTR record → the service type E2U+sip → the regular expression !^(.*)\$! → the SIP URI of UE B backreference (\1) for the user part domain name for the host part → the SIP URI parameters if applicable

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## Annex A (normative): Zip file with TPLan code

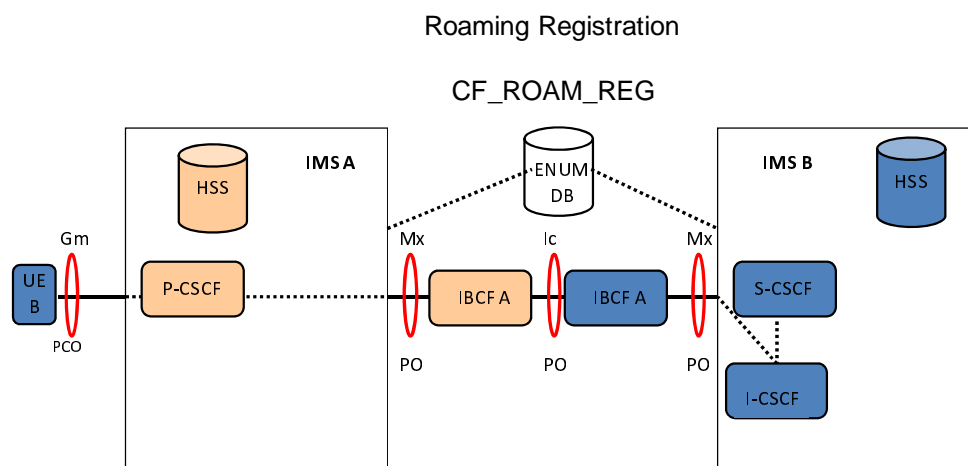
The test purposes defined in the present document have been automatically generated from the TPLan text files in the archive file ts\_18601101v040103p0.zip which accompanies the present document. The raw text files has been converted to a symbolic table format to allow better readability.

## Annex B (normative): IMS NNI Interoperability Test Configurations

IMS NNI interoperability test configuration identifiers have been composed using on the following abbreviations:

- REG: Only one UE
- CALL: One or two UEs
- AS: One or two UEs plus Application Server for one UE
- ROAM: UE B is roaming in home network of UE A
- INT: UE A and B are in interoperating home networks
- PSTN: One user is located in the PSTN
- IPTV: Only one UE, AS for IPTV present
- CONF: Two UEs, AS for Conference present

Note that all test configurations assume that observable interfaces are indicated as a solid line, non-observable interfaces as indicated dashed lines, and that IBCF acts in a "pass-through" mode if topology hiding is not required.



**Precondition:**

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

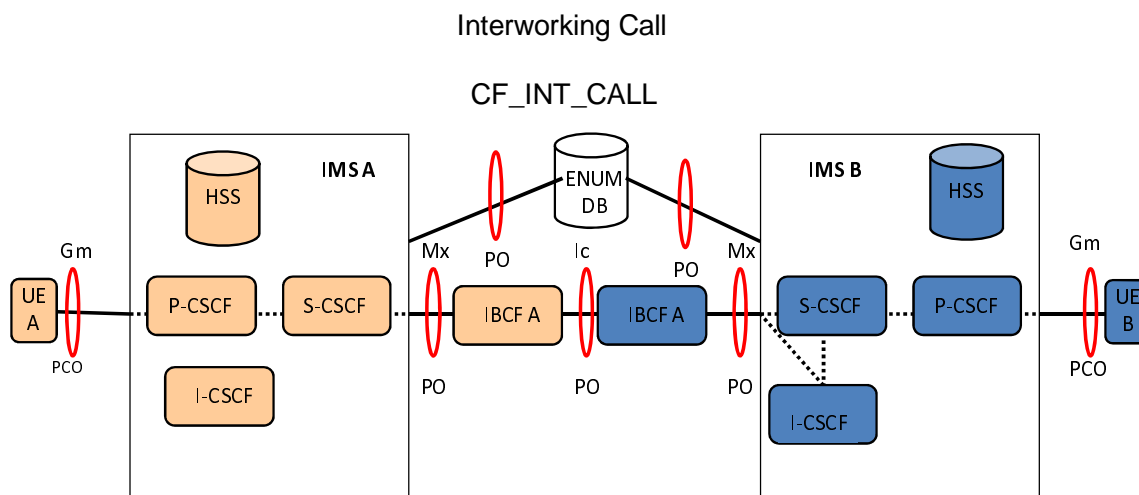
**Test configuration for:**

Registration requests and responses from UE\_B

**Example:**

REGISTER prior to IMS VoIP voice call from UE\_B

**Figure B.1: CF\_ROAM\_REG**

**Precondition:**

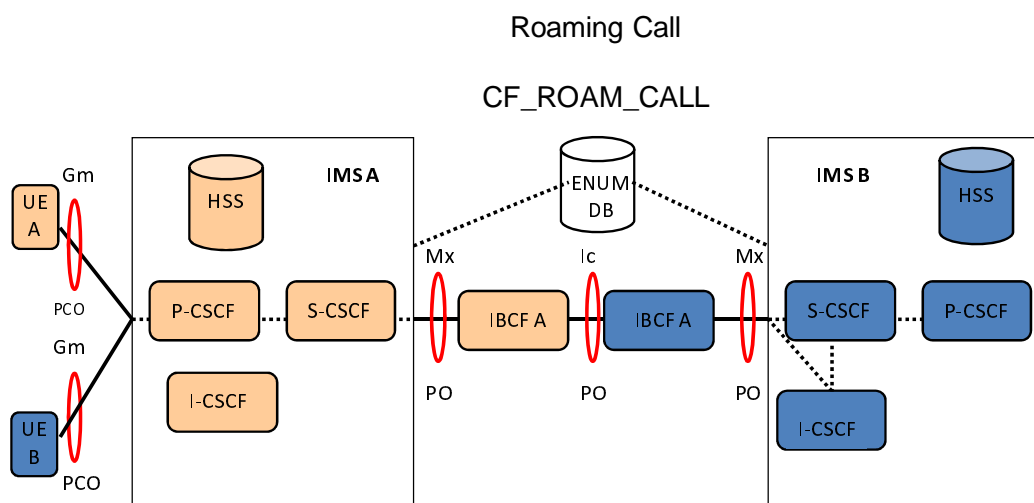
Different network operators performing origination and termination, both Ues or only UE\_A in home networks (INT), both Ues registered, no AS, a common interconnect ENUM DB and local ENUM is involved, IBCF is involved, topology hiding may apply.

**Test configuration for:**

Requests and responses between UE\_A and UE\_B in call (CALL) and messaging scenarios.  
Unsuccessful initial requests and responses from UE\_A (when UE\_B is not registered)

**Example:**

Initial INVITE in IMS VoIP voice call from UE\_A to UE\_B

**Figure B.2: CF\_INT\_CALL****Precondition:**

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

**Test configuration for:**

Requests and responses between UE\_B and UE\_A in call (CALL) and messaging scenarios

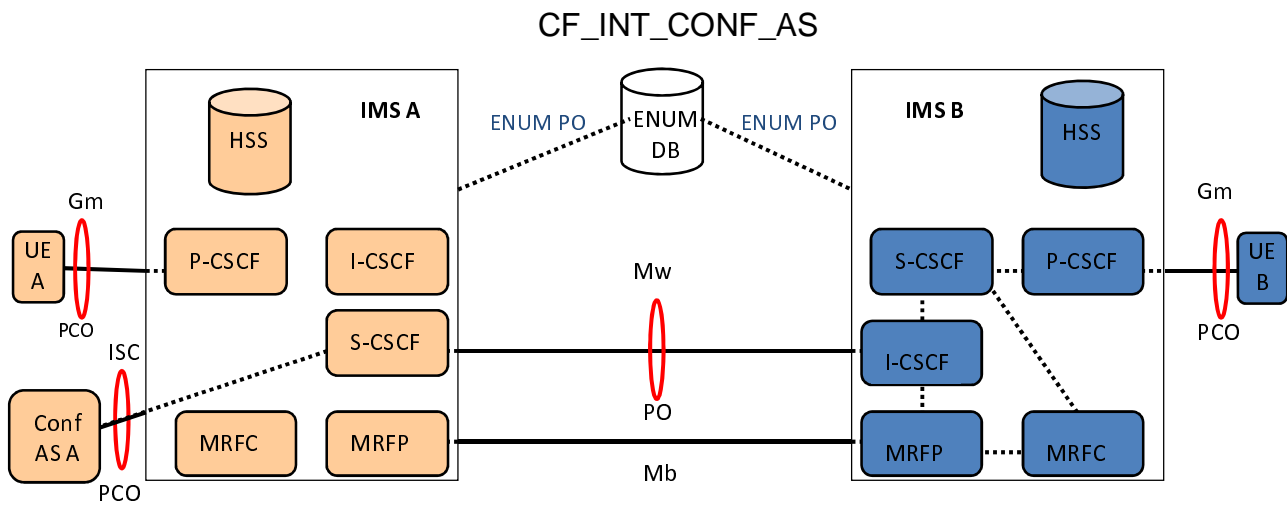
**Example:**

Initial INVITE in IMS VoIP voice call from UE\_B to UE\_A

**Figure B.3: CF\_ROAM\_CALL**



## Interworking Conference Server



## Precondition:

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

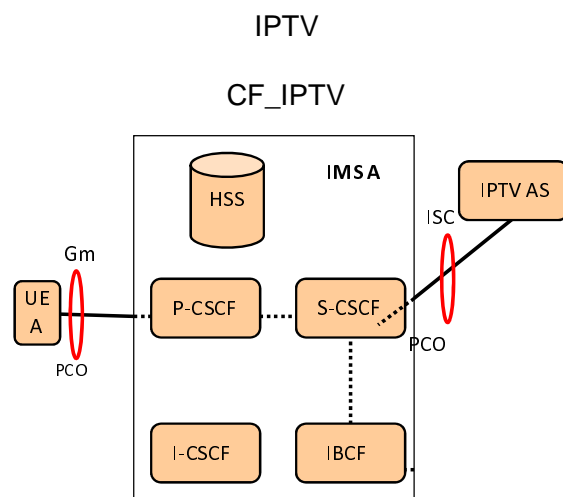
## Test configuration for:

Requests and responses between UE\_A and UE\_B in an Ad-hoc Conference call (CONF\_CALL)

## Example:

Initial INVITE from UE\_A to initiate an ad-hoc Conference call in IMS\_A, and subsequent invitation to UE\_B to join (via REFER method from UE\_A)

**Figure B.6: CF\_INT\_CONF\_CALL**



## Precondition:

UE\_A registered in home network, IPTV\_AS involved

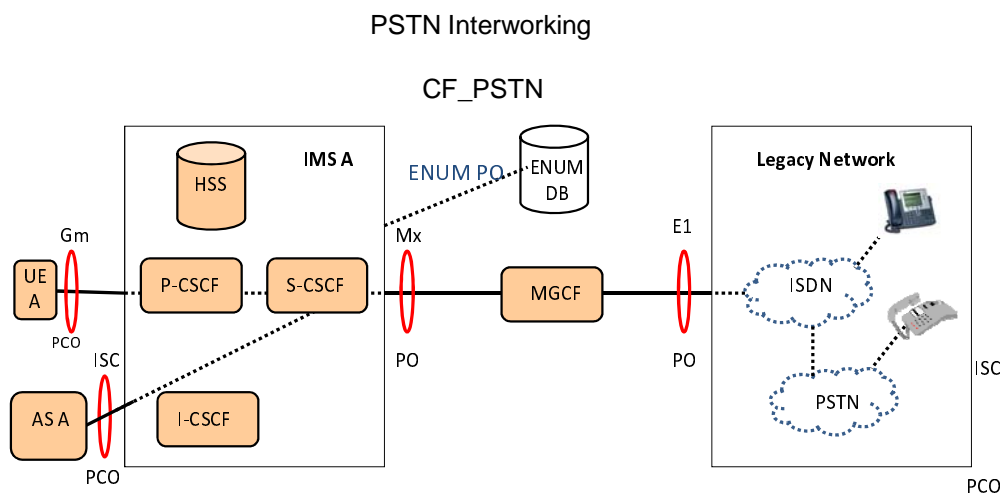
## Test configuration for:

Requests and responses between UE\_A and IPTV AS

## Example:

Initial INVITE from UE\_A to initiate an IPTV Broadcast session

**Figure B.7: CF\_IPTV**



**Precondition:**

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

**Test configuration for:**

Requests and responses between ASes and UEs

**Example:**

Initial INVITE in IMS VoIP voice call unconditionally forwarded to UE\_B by AS\_A (CFU), AS\_A acts as routing AS

**Figure B.8: CF\_PSTN**

