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IMS Network Testing (INT);
IMS NNI Interoperability Test Specifications;
Part 1: Test Purposes for IMS NNI Interoperability

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Foreword

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

The present document is part 1 of a multi-part deliverable covering the IMS NNI Interoperability Test Specifications, as identified below:

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

Part 2: "Test Descriptions for IMS NNI Interoperability".

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

Introduction

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

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

1 Scope

The present document specifies interoperability Test 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].

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.

3 Abbreviations

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

3GPP	3rd Generation Partnership Project
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

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
```

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_18601101v040101p0.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 where as 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

	A	B		
Step	**Direction**		**Message**	**IF**
1	↘	↗	**some request** ✓ this header ✓ this one parameter ➔ this value ✓ this other parameter ➔|| that value ✗ that parameter ✗ that header	**Xx**
2a	↖	↙	**failure response**	**Xx**
2b	↖||	||↙	**no message**	**Xx**

5.2 General Capabilities

Test Purpose						
Identifier:	**TP_IMS_4002_01**					
Summary:	IMS CN components shall support SIP messages > 1 300 bytes					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 4.2A ¶1		**Config Ref:**	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	↘	↗			**MESSAGE** addressed to UE B ✓ a Message Body greater than 1 300 bytes	
2		↘	↗		**MESSAGE** ✓ the Message Body greater than 1 300 bytes	

5.3 Registration Procedures

5.3.1 Registration at P-CSCF

Test Purpose					
Identifier:	**TP_IMS_5005_01**				
Summary:	The P-CSCF shall support the Path header				
IUT Role:	IMS A				
References:	TS 124 229 (V9.5.0), [1] clause 5.2.1 ¶8		**Config Ref:**	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	↖		↙	**protected REGISTER** addressed to IMS B ✓ a Path header	
2	↘	↗		**REGISTER** ✓ a Path header	

Test Purpose					
Identifier:	**TP_IMS_5011_01**				
Summary:	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				
IUT Role:	IMS A				
References:	TS 124 229 (V9.5.0) [1], clause 5.2.2.1 ¶16 (2nd numbered list) and 5.2.2.2		**Config Ref:**	CF_ROAM_REG	
	Entities			**Condition**	
	IMS A	**IMS B**	**UE B**		
	×			IMS A not configured for topology hiding	
		✓	✓	user of UE B existing in IMS B	
	×		×	UE B has not established a security association with IUT	
	IMS A	**IMS B**	**UE B**		
Step	**Direction**			**Message**	**IF**
1	→		→	**unprotected REGISTER** ✓ a Security-Client header	
2	→	→		**REGISTER** ✓ a Path header ✓ P-CSCF SIP URI of IMS A ✓ a Require header ✓ a path option tag ✓ a P-Charging-Vector header ✓ an icid-value parameter ✓ an orig-ioi parameter ➔ IMS A × a term-ioi parameter ✓ a Authorization header ✓ an integrity-protected parameter ➔ no × a Security-Verify header × a Security-Client header ✓ a P-Visited-Network-ID header ➔ the visited network at the home network	

Test Purpose					
Identifier:	**TP_IMS_5011_02**				
Summary:	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				
IUT Role:	IMS A				
References:	TS 124 229 (V9.5.0) [1], clauses 5.2.2.1 ¶1 ¶16 (2nd numbered list) and 5.2.2.2		**Config Ref:**	CF_ROAM_REG	
	Entities			**Condition**	
	IMS A	**IMS B**	**UE B**		
	×			IMS A not configured for topology hiding	
		✓	✓	user of UE B existing in IMS B	
	✓		✓	UE B has established a security association with IUT	
	IMS A	**IMS B**	**UE B**		
Step	**Direction**			**Message**	**IF**
1	→		←	**protected REGISTER** ✓ a Security-Client header	
2	←	→		**REGISTER** ✓ a Path header ✓ P-CSCF SIP URI of IMS A ✓ a Require header ✓ a path option tag ✓ a P-Charging-Vector header ✓ an icid parameter ✓ an orig-ioi parameter ➔ IMS A × a term-ioi parameter ✓ a Authorization header ✓ an integrity-protected parameter ➔ yes × a Security-Verify header × a Security-Client header ✓ a P-Visited-Network-ID header ➔ the visited network at the home network	

Test Purpose					
Identifier:	**TP_IMS_5011_03**				
Summary:	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				
IUT Role:	IMS A				
References:	TS 124 229 (V9.5.0) [1], clauses 5.2.2.1 ¶16 (2nd numbered list) and 5.2.2.3		**Config Ref:**	CF_ROAM_REG	
	Entities			**Condition**	
	IMS A	**IMS B**	**UE B**		
	×			IMS A not configured for topology hiding	
		✓	✓	user of UE B existing in IMS B	
	×		×	UE B has not established a security association with IUT	
	IMS A	**IMS B**	**UE B**		
Step	**Direction**			**Message**	**IF**
1	⇦		⇦	**unprotected REGISTER**	
2	⇨	⇨		**REGISTER** ✓ a Path header ✓ P-CSCF SIP URI of IMS A ✓ a Require header ✓ a path option tag ✓ a P-Charging-Vector header ✓ an icid-value parameter ✓ an orig-ioi parameter ➔ IMS A × a term-ioi parameter ✓ a Authorization header ✓ an integrity-protected parameter ➔ ip-assoc-pending or × an integrity-protected parameter ✓ a P-Visited-Network-ID header ➔ the visited network at the home network	

Test Purpose					
Identifier:	**TP_IMS_5011_04**				
Summary:	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				
IUT Role:	IMS A				
References:	TS 124 229 (V9.5.0) [1], clauses 5.2.2.1 ¶1 ¶16 (2nd numbered list) and 5.2.2.3		**Config Ref:**	CF_ROAM_REG	
	Entities			**Condition**	
	IMS A	**IMS B**	**UE B**		
	×			IMS A not configured for topology hiding	
		✓	✓	user of UE B existing in IMS B	
	×		×	UE B has established a security association with IUT	
	IMS A	**IMS B**	**UE B**		
Step	**Direction**			**Message**	**IF**
1	⇦		⇦	**protected REGISTER**	
2	⇨	⇨		**REGISTER** ✓ a Path header ✓ P-CSCF SIP URI of IMS A ✓ a Require header ✓ a path option tag ✓ a P-Charging-Vector header ✓ an icid parameter ✓ an orig-ioi parameter ➔ IMS A × a term-ioi parameter ✓ a Authorization header ✓ an integrity-protected parameter ➔ ip-assoc-yes ✓ a P-Visited-Network-ID header ➔ the visited network at the home network	

Test Purpose					
Identifier:	**TP_IMS_5203_01**				
Summary:	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				
IUT Role:	IMS A				
References:	TS 124 229 (V9.5.0) [1], clause 5.2.2.1 ¶33 (item 6 in 2nd numbered list)		**Config Ref:**	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**		
Step	**Direction**			**Message**	**IF**
1	⇦||	||⇨		**Any response**	
2	⇩	⇨		**REGISTER** addressed to another entry point	

Test Purpose					
Identifier:	**TP_IMS_5203_02**				
Summary:	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				
IUT Role:	IMS A				
References:	TS 124 229 (V9.5.0) [1], clause 5.2.2.1 ¶33 (item 6 in 2nd numbered list)		**Config Ref:**	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**		
Step	**Direction**			**Message**	**IF**
1	⇦	⇨		**3xx response**	
2	⇩	⇨		**REGISTER** addressed to another entry point	

Test Purpose					
Identifier:	**TP_IMS_5203_03**				
Summary:	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				
IUT Role:	IMS A				
References:	TS 124 229 (V9.5.0) [1], clause 5.2.2.1 ¶33 (item 6 in 2nd numbered list)		**Config Ref:**	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**		
Step	**Direction**			**Message**	**IF**
1	⇦	⇨		**480 response**	
2	⇩	⇨		**REGISTER** addressed to another entry point	

Test Purpose					
Identifier:	**TP_IMS_5044_01**				
Summary:	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				
IUT Role:	IMS A				
References:	TS 124 229 (V9.5.0) [1], clause 5.2.3 ¶2 (1st numbered list)		**Config Ref:**	CF_ROAM_REG	
	Entities			**Condition**	
	IMS A	**IMS B**	**UE B**		
	✓		✓	UE B having sent a protected REGISTER to IMS A	
	x			IMS A not configured for topology hiding	
	IMS A	**IMS B**	**UE B**		
Step	**Direction**			**Message**	**IF**
1	←	→		**200 response**	
2	→	←		**SUBSCRIBE** ✓ a Request URI ✓ "the resource to which the P-CSCF wants to subscribe to" and ✓ a From header ✓ P-CSCF_SIP_URI of IMS_A and ✓ a To_header ✓ the default_public_user_identity of UE_B and ✓ an Event_header ✓ the reg event package and ✓ an Expires_header ➔ *"a value greater than the one in the Expires_header of the 200_response" and* ✓ a P-Asserted-Identity_header ✓ the P-CSCF_SIP_URI of IMS_A and ✓ a P-Charging-Vector header ✓ an icid-value parameter	

5.3.2 Registration at S-CSCF

Test Purpose					
Identifier:	**TP_IMS_5088_01**				
Summary:	S-CSCF shall deregister unexpired registration upon receipt of a new REGISTER with new contact information				
IUT Role:	IMS B				
References:	TS 124 229 (V9.5.0) [1], clause 5.4.1.2.1 ¶7 (item 2 in 1st numbered list)		**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	
		×	×	UE B not de-registered in IMS B	
	IMS A	**IMS B**	**UE B**		
Step	**Direction**			**Message**	**IF**
1a		→	←	**initial REGISTER** ✓ an Authorization header ✓ an integrity-protected parameter ➔ no or tls-pending or ip-assoc-pending	
1b		→	←	**initial REGISTER** ✓ an Authorization header × an integrity-protected parameter	
2	←	→		**NOTIFY** ✓ a Request URI ➔ the P-CSCF SIP URI of IMS A ✓ an Event header ➔ the reg event package ✓ a P-Charging-Vector header ✓ an icid-value parameter ✓ a Route header ➔ the original Route header from SUBSCRIBE ✓ a Message Body ✓ for each registered public identity of UE B a registration element ✓ an aor attribute ➔ registered public identity of UE B ✓ a state attribute ➔ terminated ✓ a contact subelement ✓ an event attribute ➔ deactivated **or** rejected ✓ a state attribute ➔ terminated ✓ a URI subelement ➔ the contact address of UE B	

Test Purpose					
Identifier:	**TP_IMS_5089_01**				
Summary:	In case of IMS AKA as security mechanism the S-CSCF shall return 401 (Unauthorized) upon receipt of a REGISTER from an UE not previously registered				
IUT Role:	IMS B				
References:	TS 124 229 (V9.5.0) [1], clause 5.4.1.2.1A ¶1		**Config Ref:**	CF_ROAM_REG	
	Entities			**Condition**	
	IMS A	**IMS B**	**UE B**		
		✓	✓	user of UE B existing in IMS B	
		×	×	UE B not registered in IMS B	
	✓		✓	UE B visiting IMS A	
	✓	✓		IMS A within the trust domain of IMS B	
	IMS A	**IMS B**	**UE B**		
Step	**Direction**			**Message**	**IF**
1	→			**initial REGISTER** ✓ an Authorization header ✓ an integrity-protected parameter ➔ no	
2	←			**401 response** ✓ an WWW-Authenticate header ✓ a realm parameter ➔ the operator identifier of IMS B ✓ a nonce parameter ✓ a RAND parameter ✓ an AUTN parameter) ✓ an algorithm parameter ➔ AKAv1-MD5 ✓ an ik parameter ✓ a ck parameter	

Test Purpose					
Identifier:	**TP_IMS_5089_02**				
Summary:	In case of SIP digest as security mechanism the S-CSCF shall return 401 (Unauthorized) upon receipt of a REGISTER from an UE not previously registered				
IUT Role:	IMS B				
References:	TS 124 229 (V9.5.0) [1], clause 5.4.1.2.1B ¶1		**Config Ref:**	CF_ROAM_REG	
	Entities			**Condition**	
	IMS A	**IMS B**	**UE B**		
		✓	✓	user of UE B existing in IMS B	
		×	×	UE B not registered in IMS B	
	✓		✓	UE B visiting IMS A	
	✓	✓		IMS A within the trust domain of IMS B	
	IMS A	**IMS B**	**UE B**		
Step	**Direction**			**Message**	**IF**
1	→			**initial REGISTER** ✓ an Authorization header	
2	←			**401 response** ✓ an WWW-Authenticate header ✓ a realm parameter ➔ the operator identifier of IMS B ✓ a nonce parameter ✓ an algorithm parameter ➔ MD5 ✓ a qop parameter ➔ auth	

Test Purpose					
Identifier:	**TP_IMS_5092_01**				
Summary:	200 OK on REGISTER from UE to the S-CSCF				
IUT Role:	IMS B				
References:	TS 124 229 (V9.5.0) [1], clause 5.4.1.2.2F ¶1		**Config Ref:**	CF_ROAM_REG	
	Entities			**Condition**	
	IMS A	**IMS B**	**UE B**		
		✓	✓	user of UE B existing in IMS B	
	✓		✓	UE B visiting IMS A	
		×	×	UE B not registered in IMS B	
		✓		IMS B has challenged with a 401 response the REGISTER request	
	IMS A	**IMS B**	**UE B**		
Step	**Direction**			**Message**	**IF**
1	←	→		**protected REGISTER**	
2	→	←		**200 response** ✓ the same Path header as in the protected REGISTER ✓ a P-Associated-URI header ✓ all registered public identities its associated set of implicitly registered public user identities ➔ first the default public user identity no barred public user identities ✓ a Service-Route header ➔ the S-CSCF SIP URI of IMS B ✓ a P-Charging-Vector header ✓ a term-ioi parameter ➔ operator identifier of IMS B ✓ a Contact header ➔ all contact addresses for the default public user identity of UE B	

Test Purpose					
Identifier:	**TP_IMS_5096_01**				
Summary:	The network shall handle incoming SUBSCRIBE correctly				
IUT Role:	IMS B				
References:	TS 124 229 (V9.5.0) [1], clause 5.4.2.1.1 ¶1		**Config Ref:**	CF_ROAM_REG	
	Entities			**Condition**	
	IMS A	**IMS B**	**UE B**		
		✓	✓	UE B registered in IMS B	
	✓		✓	UE B visiting IMS A	
	IMS A	**IMS B**	**UE B**		
Step	**Direction**			**Message**	**IF**
1	←	→		**SUBSCRIBE** ✓ an Event header ➔ the reg event package	
2		←	→	**2xx response** ✓ an Expires header ➔ the same **or** lower expiry time than specified in the initial SUBSCRIBE	

Test Purpose					
Identifier:	**TP_IMS_5093_01**				
Summary:	S-CSCF shall deregister in network-initiated de-registration				
IUT Role:	IMS B				
References:	TS 124 229 (V9.5.0) [1], clause 5.4.1.5 ¶6 (numbered list)		**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 A	**IMS B**	**UE B**		
Step	**Direction**			**Message**	**IF**
1	↳	↱		**network initiated deregistration event**	
2	↰	↱		**NOTIFY** ✓ a Request URI ➔ UE_B ✓ an Event header ➔ the reg event package ✓ a P-Charging-Vector header ✓ an icid-value parameter ✓ a Route header ➔ the original Route header from SUBSCRIBE ✓ a Message Body ✓ for each registered public identity of UE B a registration element ✓ an aor attribute ➔ registered public identity of UE B ✓ a state attribute ➔ terminated ✓ a contact subelement ✓ an event attribute ➔ deactivated **or** rejected ✓ a state attribute ➔ terminated ✓ a URI subelement ➔ the contact address of UE B	
3	↰	↱		**NOTIFY** ✓ a Request URI ➔ UE_A ✓ an Event header ➔ the reg event package ✓ a P-Charging-Vector header ✓ an icid-value parameter ✓ a Route header ➔ the original Route header from SUBSCRIBE ✓ a Message Body ✓ for each registered public identity of UE A a registration element ✓ an aor attribute ➔ registered public identity of UE A ✓ a state attribute ➔ terminated ✓ a contact subelement ✓ an event attribute ➔ deactivated **or** rejected ✓ a state attribute ➔ terminated ✓ a URI subelement ➔ the contact address of UE A	

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				**NOTIFY** ✓ a Request URI ➔ UE_B ✓ an Event header ➔ the reg event package ✓ a P-Charging-Vector header ✓ an icid-value parameter ✓ a Route header ➔ the original Route header from SUBSCRIBE ✓ a Message Body ✓ for each registered public identity of UE B a registration element ✓ an aor attribute ➔ registered public identity of UE B ✓ a state attribute ➔ active ✓ a contact subelement ✓ an event attribute ➔ shortened ✓ a state attribute ➔active ✓ a URI subelement ➔ the contact address of UE B	
3				**NOTIFY** ✓ a Request URI ➔ the P-CSCF_SIP_URI of IMS_A ✓ an Event header ➔ the reg event package ✓ a P-Charging-Vector header ✓ an icid-value parameter ✓ a Route header ➔ the original Route header from SUBSCRIBE ✓ a Message Body ✓ for each registered public identity of UE A a registration element ✓ an aor attribute ➔ registered public identity of UE B ✓ a state attribute ➔ active ✓ a contact subelement ✓ an event attribute ➔ shortened ✓ a state attribute ➔ active ✓ a URI subelement ➔ the contact address of UE B	

5.3.3 Registration at I-CSCF

Interoperability Test Purpose					
Identifier:	**TP_IMS_5129_01**				
Summary:	If a request is received from a non-trusted domain, a 403 (Forbidden) response shall be returned by I-CSCF				
IUT Role:	IMS B				
References:	TS 124 229 (V9.5.0) [1], clause 5.3.1.2 ¶1		**Config Ref:**	CF_ROAM_REG	
	Entities			**Condition**	
	IMS A	**IMS B**	**UE B**		
		✓	✓	user of UE B existing in IMS B	
	×	×		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					
Identifier:	**TP_IMS_5134_01**				
Summary:	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				
IUT Role:	IMS A				
References:	TS 124 229 (V9.5.0) [1], clause 5.10.4.1 ¶5		**Config Ref:**	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					
Identifier:	**TP_IMS_5401_01**				
Summary:	IBCF shall, if topology hiding is required, apply the encryption for the Path header				
IUT Role:	IMS A				
References:	TS 124 229 (V9.5.0) [1], clause 5.10.2.1 ¶1		**Config Ref:**	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				
Identifier:	**TP_IMS_5402_01**			
Summary:	IBCF shall select a new entry point and forward the original REGISTER request on no response.			
IUT Role:	IMS A			
References:	TS 124 229 (V9.5.0) [1], clause 5.10.2.1 ¶1 (item 3 in 1st numbered list)	**Config Ref:**	CF_ROAM_REG	
	Entities		**Condition**	
	IMS A	**IMS 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	
	IMS A	**IMS B**		
Step	**Direction**		**Message**	**IF**
1			**Any response**	
2			**original REGISTER** addressed to another entry point	

Interoperability Test Purpose				
Identifier:	**TP_IMS_5402_02**			
Summary:	IBCF shall select a new entry point and forward the original REGISTER request on 3xx response.			
IUT Role:	IMS A			
References:	TS 124 229 (V9.5.0) [1], clause 5.10.2.1 ¶1 (item 3 in 1st numbered list)	**Config Ref:**	CF_ROAM_REG	
	Entities		**Condition**	
	IMS A	**IMS 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	
	IMS A	**IMS B**		
Step	**Direction**		**Message**	**IF**
1			**3xx response**	
2			**original REGISTER** addressed to another entry point	

Interoperability Test Purpose				
Identifier:	**TP_IMS_5402_03**			
Summary:	IBCF shall select a new entry point and forward the original REGISTER request on 480 response.			
IUT Role:	IMS A			
References:	TS 124 229 (V9.5.0) [1], clause 5.10.2.1 ¶1 (item 3 in 1st numbered list)	**Config Ref:**	CF_ROAM_REG	
	Entities		**Condition**	
	IMS A	**IMS 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	
	IMS A	**IMS B**		
Step	**Direction**		**Message**	**IF**
1			**480 response**	
2			**original REGISTER** addressed to another entry point	

Interoperability Test Purpose				
Identifier:	**TP_IMS_5411_01**			
Summary:	If a request is received from a non-trusted domain, a 403 (Forbidden) response shall be returned by IBCF			
IUT Role:	IMS B			
References:	TS 124 229 (V9.5.0) [1], clause 5.10.3.1 ¶1 (item 1 in 1st numbered list)		**Config Ref:**	CF_ROAM_REG
	Entities		**Condition**	
	IMS A	**IMS B**		
		✓	IMS B configured for topology hiding	
	×	×	IMS A not within the trust domain of IMS B	
	IMS A	**IMS B**		
Step	**Direction**		**Message**	**IF**
1	⇘	⇗	**valid REGISTER**	
2	⇖	⇙	**403 response**	

5.4 Dialog Procedures

5.4.1 Dialog at P-CSCF

Test Purpose						
Identifier:	**TP_IMS_5046_01**					
Summary:	When the P-CSCF receives an initial INVITE request for a dialog from a UE for which a Service-Route header list exists without topology hiding					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.2.6.3.3 ¶1 (1st numbered list)				**Config Ref:**	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 not configured for topology hiding	
	UE A	**IMS A**	**IMS B**	**UE B**		
Step	**Direction**				**Message**	**IF**
1		⇖		⇙	**initial INVITE**	
2		⇘	⇗		**INVITE** ✓ a topmost Route header ➔|| the P-CSCF SIP URI of IMS A ✓ a Route header ✓ the list of Service Route header URIs from the registration ✓ an additional Via header ✓ the P-CSCF via port number ✓ the P-CSCF-FQDN address **or** the P-CSCF-IP address of the IMS A ✓ an additional topmost Record-Route header ✓ the P-CSCF port number where it awaits subsequent requests from UE A ✓ the P-CSCF-FQDN address **or** the P-CSCF-IP address of the IMS A × P-Preferred-Identity header ✓ a P-Asserted-Identity header ✓ an address of UE B ✓ a P-Charging-Vector header ✓ an icid-value parameter	

Test Purpose						
Identifier:	**TP_IMS_5046_02**					
Summary:	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					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.2.6.3.3 ¶1 (1st numbered list)				**Config Ref:**	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					**initial INVITE**	
2					**INVITE** ✓ a topmost Route header ➔ the IBCF SIP URI of IMS A ➔|| the P-CSCF SIP URI of IMS A ✓ a Route header ✓ the list of Service Route header URIs from the registration ✓ an additional Via header ✓ the P-CSCF via port number ✓ the P-CSCF-FQDN address **or** the P-CSCF-IP address of the IMS A ✓ an additional topmost Record-Route header ✓ the P-CSCF port number where it awaits subsequent requests from UE A ✓ the P-CSCF-FQDN address **or** the P-CSCF-IP address of the IMS A ✗ P-Preferred-Identity header ✓ a P-Asserted-Identity header ✓ an address of UE A ✓ a P-Charging-Vector header ✓ an icid-value parameter	

Test Purpose						
Identifier:	**TP_IMS_5046_03**					
Summary:	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					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.2.6.3.3 ¶1 (1st numbered list)			**Config Ref:**	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 not configured for topology hiding	
	UE A	**IMS A**	**IMS B**	**UE B**		
Step	**Direction**				**Message**	**IF**
1		→		←	**SUBSCRIBE**	
2		←	→		**SUBSCRIBE** ✓ a topmost Route header ➔|| the P-CSCF SIP URI of IMS A ✓ a Route header ✓ the list of Service Route header URIs from the registration ✓ an additional Via header ✓ the P-CSCF via port number ✓ the P-CSCF-FQDN address **or** the P-CSCF-IP address of the IMS A ✓ an additional topmost Record-Route header ✓ the P-CSCF port number where it awaits subsequent requests from UE A ✓ the P-CSCF-FQDN address **or** the P-CSCF-IP address of the IMS A × P-Preferred-Identity header ✓ a P-Asserted-Identity header ✓ an address of UE A ✓ a P-Charging-Vector header ✓ an icid-value parameter	

Test Purpose						
Identifier:	**TP_IMS_5046_04**					
Summary:	When the P-CSCF receives an initial request for a dialog from a UE for which a Service-Route header list exists with topology hiding					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.2.6.3.3 ¶1 (1st numbered list)			**Config Ref:**	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		→		←	**SUBSCRIBE**	
2		←	→		**SUBSCRIBE** ✓ a topmost Route header ➔ the IBCF SIP URI of IMS A ➔|| the P-CSCF SIP URI of IMS A ✓ a Route header ✓ the list of Service Route header URIs from the registration ✓ an additional Via header ✓ the P-CSCF via port number ✓ the P-CSCF-FQDN address **or** the P-CSCF-IP address of the IMS A ✓ an additional topmost Record-Route header ✓ the P-CSCF port number where it awaits subsequent requests from UE A ✓ the P-CSCF-FQDN address **or** the P-CSCF-IP address of the IMS A ✗ P-Preferred-Identity header ✓ a P-Asserted-Identity header ✓ an address of UE A ✓ a P-Charging-Vector header ✓ an icid-value parameter	

Test Purpose						
Identifier:	**TP_IMS_5048_01**					
Summary:	P-CSCF forwards a target refresh request from the UE					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.2.6.3.5 ¶1 (1st numbered list)			**Config Ref:**	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		→		←	**subsequent INVITE**	
2		←	→		**INVITE** ✓ a topmost Route header ➔|| the P-CSCF SIP URI of IMS A ✓ an additional Via header ✓ the P-CSCF via port number ✓ the P-CSCF-FQDN address **or** the P-CSCF-IP address of the IMS A	

Test Purpose						
Identifier:	**TP_IMS_5052_01**					
Summary:	The P-CSCF modifies a request, other than a target refresh request, from the UE subsequent to a successful initial request for a dialog					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.2.6.3.9 ¶1 (1st numbered list)			**Config Ref:**	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		⇩	⇨		**BYE** × a Route header ✓ the P-CSCF SIP URI of IMS A ✓ the same Record-Route header as in the previous **ACK** ✓ a P-Charging-Vector header ✓ an icid-value parameter	

Test Purpose						
Identifier:	**TP_IMS_5053_01**					
Summary:	P-CSCF receives from the UE a request for an unknown method without topology hiding					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.2.6.3.11 ¶1 (1st numbered list)			**Config Ref:**	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 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		⇩	⇨		**Unknown Method** ✓ a Route header ➔ the list of Service Route header URIs from the registration × a P-Preferred-Identity header ✓ a P-Asserted-Identity header ✓ an address of UE A	

Test Purpose						
Identifier:	**TP_IMS_5053_02**					
Summary:	P-CSCF receives from the UE a request for an unknown method with topology hiding					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.2.6.3.11 ¶1 (1st numbered list)			**Config Ref:**	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	→	←			**Unknown Method** addressed to UE B	
2		→	←		**Unknown Method** ✓ a Route header ➔ the list of Service Route header URIs from the registration ✗ a P-Preferred-Identity header ✓ a P-Asserted-Identity header ✓ an address of UE A	

Test Purpose						
Identifier:	**TP_IMS_5055_01**					
Summary:	The P-CSCF receives a 180 response to an initial request for a dialog from the UE					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.2.6.4.4 ¶1 (1st numbered list)			**Config Ref:**	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	→	←			**180 response**	
2		→	←		**180 response** ✓ a Record-Route header ➔ the P-CSCF SIP URI and port number of IMS A where it expects subsequent requests ✗ a comp parameter ✗ a P-Preferred-Identity header ✓ a P-Asserted-Identity header ✓ the public identity sent in P-Called Party-ID header sent in the initial request	

Test Purpose						
Identifier:	**TP_IMS_5055_02**					
Summary:	The P-CSCF receives a 2xx response to an initial request for a dialog from the UE					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.2.6.4.4 ¶1 (1st numbered list)			**Config Ref:**	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	⇦	⇨			**200 response**	
2		⇦	⇨		**200 response** ✓ a Record-Route header ➔ the P-CSCF SIP URI and port number of IMS A where it expects subsequent requests × a comp parameter × a P-Preferred-Identity header ✓ a P-Asserted-Identity header ✓ the public identity sent in P-Called Party-ID header sent in the initial request	

Test Purpose						
Identifier:	**TP_IMS_5067_01**					
Summary:	The P-CSCF shall include the access-network-charging-info parameter in the P-Charging-Vector header in the first request originated by the UE					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.2.7.2 ¶5			**Config Ref:**	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		⇦		⇦	**initial INVITE**	
2		⇦	⇨		**INVITE** ✓ a P-Charging-Vector header ✓ a access-network-charging-info parameter	

Test Purpose						
Identifier:	**TP_IMS_5070_01**					
Summary:	The P-CSCF shall respond with a 100 (Trying) provisional response on initial INVITE in terminating network					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.2.7.3 ¶3			**Config Ref:**	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		⇦		⇦	**initial INVITE**	
2		⇦	⇨		**100 response**	

Test Purpose							
Identifier:	**TP_IMS_5072_01**						
Summary:	P-CSCF sends CANCEL in case its UE goes down during dialog initiation						
IUT Role:	IMS A						
References:	TS 124 229 (V9.5.0) [1], clause 5.2.8.1.1 ¶1				**Config Ref:**	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	↰		↱			**CANCEL** ✓ a Reason header ✓ a status code parameter ➔ 503 Service Unavailable	
3			↰	↱		**503 response**	

Test Purpose							
Identifier:	**TP_IMS_5073_01**						
Summary:	P-CSCF sends BYE in case its calling UE goes down in ongoing dialog						
IUT Role:	IMS B						
References:	TS 124 229 (V9.5.0) [1], clause 5.2.8.1.2 ¶1 (item 1 in 1st numbered list)				**Config Ref:**	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		↰		↱		**BYE** ✓ Request URI ➔ Contact header value of UE A ✓ To header ➔ initial 200 OK To value from UE A ✓ From header ➔ initial INVITE From value from UE B ✓ Call-ID header ➔ initial INVITE Call Id value from UE B ✓ CSeq header ✓ an incremented Sequence Number ✓ Route header ➔ dialog specific routing information for UE A ✓ Reason header ➔ 503 Service Unavailable ✓ further headers based on local policy or call release reason	

Test Purpose							
Identifier:	**TP_IMS_5074_01**						
Summary:	P-CSCF sends BYE in case its called UE goes down in ongoing dialog						
IUT Role:	IMS A						
References:	TS 124 229 (V9.5.0) [1], clause 5.2.8.1.2 ¶1 (item 3 in 1st numbered list)					**Config Ref:**	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 A has initiated a dialog with UE B	
	UE A	**IMS A**	**NWK**	**IMS B**	**UE B**		
Step	**Direction**					**Message**	**IF**
1			↘	↗		**an indication** that UE B is no longer available	
2		↖		↖		**BYE** ✓ Request URI ➔ Contact header value of UE A ✓ To header ➔ initial 200 OK From value from UE B ✓ From header ➔ initial INVITE To value from UE A ✓ Call-ID header ➔ initial INVITE Call Id value from UE A ✓ CSeq header ✓ an incremented Sequence Number ✓ Route header ➔ dialog specific routing information for UE A ✓ Reason header ➔ 503 Service Unavailable ✓ further headers based on local policy or call release reason	

Test Purpose						
Identifier:	**TP_IMS_5080_01**					
Summary:	The P-CSCF shall include the updated access-network-charging-info parameter from P-Charging-Vector header when sending subsequent INVITE to the S-CSCF.					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.2.9.1 ¶2				**Config Ref:**	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		↖		↗	**subsequent INVITE**	
2		↘	↗		**INVITE** ✓ a P-Charging-Vector header ✓ an updated access-network-charging-info parameter	

Test Purpose						
Identifier:	**TP_IMS_5080_02**					
Summary:	The P-CSCF shall include the updated access-network-charging-info parameter from P-Charging-Vector header when sending the subsequent UPDATE to the S-CSCF.					
IUT Role:	IMS A					
References:	TS 124 229 [1] (V9.5.0), clause 5.2.9.1 ¶2			**Config Ref:**	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		⇦		⇙	**subsequent UPDATE**	
2		⇩	⇗		**UPDATE** ✓ a P-Charging-Vector header ✓ an updated access-network-charging-info parameter	

Test Purpose						
Identifier:	**TP_IMS_5081_01**					
Summary:	P-CSCF 100 response to a re-INVITE					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.2.9.2 ¶1			**Config Ref:**	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		⇩	⇗		**100 response**	

Test Purpose						
Identifier:	**TP_IMS_5082_01**					
Summary:	P-CSCF sends 200 response to a target refresh request with P-Charging-Vector					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.2.9.2 ¶2			**Config Ref:**	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	
		✓		✓	IMS B has received a target refresh request in a dialog from IMS A	
	UE A	**IMS A**	**IMS B**	**UE B**		
Step	**Direction**				**Message**	**IF**
1		⇦		⇙	**200 response**	
2		⇩	⇗		**200 response** ✓ a P-Charging-Vector header ✓ an updated access-network-charging-info parameter	

5.4.2 Dialog at S-CSCF

Test Purpose						
Identifier:	**TP_IMS_5097_01**					
Summary:	S-CSCF must inserts 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					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶11 (1st numbered list)			**Config Ref:**	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		↳	⇗		**initial INVITE** × 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 ✓ a Record-Route header ➔ the originating S-CSCF SIP URI × a P-Access-Network-Info header	

Test Purpose						
Identifier:	**TP_IMS_5097_02**					
Summary:	S-CSCF inserts a second P-Asserted-Identity header indicating a registered tel URI or sip URI whichever is not present in initial INVITE					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶11 (item 9 1st numbered list)			**Config Ref:**	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		↳	⇗		**initial INVITE** ✓ a P-Asserted-Identity header ➔ the SIP URI of UE A ✓ a P-Asserted-Identity header ➔ the Tel URI of UE A	

Test Purpose							
Identifier:	**TP_IMS_5097_04**						
Summary:	S-CSCF uses ENUM/DNS to translate Tel URIs to SIP URIs in initial INVITE requests						
IUT Role:	IMS A						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶11 (item 10 1st numbered list)			**Config Ref:**	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_D B**	**IMS B**	**UE B**		
Step	**Direction**					**Message**	**IF**
1	↳	↱				**initial INVITE** 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		↳		↱		**initial INVITE** ✓ a Request URI ➔ a SIP URI of UE B ✓ a P-Charging-Vector header ✗ an access-network-charging-info parameter	

Test Purpose						
Identifier:	**TP_IMS_5106_01**					
Summary:	S-CSCF must handle subsequent INVITE prior to sending it over NNI					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶108 (6th numbered list)			**Config Ref:**	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	↳	↱			**subsequent INVITE** addressed to UE B	
2		↳	↱		**subsequent INVITE** ✓ 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						
Identifier:	**TP_IMS_5106_02**					
Summary:	S-CSCF must handle UPDATE prior to sending it over NNI					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶108 (6th numbered list)			**Config Ref:**	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		↳	↱		**UPDATE** ✓ 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						
Identifier:	**TP_IMS_5107_01**					
Summary:	S-CSCF removes its own SIP URI from the route header before sending BYE					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶119 (item 1 in 8th numbered list)			**Config Ref:**	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		↳	↱		**BYE** ✗ Route header ➔ the S-CSCF SIP URI of IMS A	

Test Purpose						
Identifier:	**TP_IMS_5107_02**					
Summary:	S-CSCF removes its own SIP URI from the route header before sending ACK					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶119 (item 1 in 8th numbered list)			**Config Ref:**	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		↳	↱		**ACK** ✗ Route header ➔ the S-CSCF SIP URI of IMS A	

Test Purpose						
Identifier:	**TP_IMS_5107_03**					
Summary:	S-CSCF removes its own SIP URI from the route header before sending CANCEL					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶119 (item 1 in 8th numbered list)			**Config Ref:**	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						
Identifier:	**TP_IMS_5107_04**					
Summary:	S-CSCF removes its own SIP URI from the route header before sending REFER					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶119 (item 1 in 8th numbered list)			**Config Ref:**	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						
Identifier:	**TP_IMS_5108_05**					
Summary:	S-CSCF rejects barred users on initial INVITE					
IUT Role:	IMS B					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶8 (item 1 in 1st numbered list)			**Config Ref:**	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						
Identifier:	**TP_IMS_5115_01**					
Summary:	S-CSCF include term-ioi parameter and restores orig-ioi in 180 responses from UE to initial requests in terminating network					
IUT Role:	IMS B					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶91 (item 2 in 4th numbered list)			**Config Ref:**	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**		
Step	**Direction**				**Message**	**IF**
1			⇦	⇦	**180 response** addressed to UE A	
2		⇦	⇦		**180 response** ✓ 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						
Identifier:	**TP_IMS_5115_02**					
Summary:	S-CSCF include term-ioi parameter and restores orig-ioi in 2xx responses from UE to initial requests in terminating network					
IUT Role:	IMS B					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶91 (item 2 in 4th numbered list)			**Config Ref:**	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			⇦	⇦	**2xx response** addressed to UE A	
2		⇦	⇦		**2xx response** ✓ 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						
Identifier:	**TP_IMS_5115_03**					
Summary:	S-CSCF inserts a second P-Asserted-Identity header in 1xx response indicating a registered tel URI or SIP URI whichever is not present					
IUT Role:	IMS B					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶92 (item 3 in 4th numbered list)			**Config Ref:**	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 SIP URI	
	✓			✓	UE B has received an initial request for a dialog from UE A	
	UE A	**IMS A**	**IMS B**	**UE B**		
Step	**Direction**				**Message**	**IF**
1			⇦	⇦	**1xx response** addressed to UE A	
2		⇦	⇦		**1xx response** ✓ a P-Asserted-Identity header ➔ the SIP URI of UE B ✓ a P-Asserted-Identity header ➔ the Tel URI of UE B	

Test Purpose						
Identifier:	**TP_IMS_5115_04**					
Summary:	S-CSCF inserts a second P-Asserted-Identity header in 2xx response indicating a registered tel URI or SIP URI whichever is not present					
IUT Role:	IMS B					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶92 (item 3 in 4th numbered list)			**Config Ref:**	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	
				✓	UE B default registered public identity is a SIP URI	
	✓			✓	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			⇦	⇦	**2xx response** addressed to UE A	
2		⇦	⇦		**2xx response** ✓ a P-Asserted-Identity header ➔ the SIP URI of UE B ✓ a P-Asserted-Identity header ➔ the Tel URI of UE B	

Test Purpose						
Identifier:	**TP_IMS_5120_01**					
Summary:	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					
IUT Role:	IMS B					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶99 (item 3 and 5 in 7th numbered list)			**Config Ref:**	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		←	←		**INVITE** ✗ a topmost Route header ➔ the S-CSCF SIP URI of IMS B ✓ a Record-Route header ✓ the S-CSCF SIP URI	

Test Purpose						
Identifier:	**TP_IMS_5120_02**					
Summary:	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					
IUT Role:	IMS B					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶99 (item 3 and 5 in 7th numbered list)			**Config Ref:**	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		←	←		**UPDATE** ✗ a topmost Route header ➔ the S-CSCF SIP URI of IMS B ✓ a Record-Route header ✓ the S-CSCF SIP URI	

Test Purpose						
Identifier:	**TP_IMS_5121_01**					
Summary:	S-CSCF remove access-network-charging-info parameter from 1xx response to subsequent or target refresh requests					
IUT Role:	IMS B					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶123 (9th numbered list)			**Config Ref:**	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		←	←		**1xx response** ✓ a P-Charging-Vector header ✗ an access-network-charging-info parameter	

Test Purpose						
Identifier:	**TP_IMS_5121_02**					
Summary:	S-CSCF remove access-network-charging-info parameter from 2xx response to subsequent or target refresh requests					
IUT Role:	IMS B					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶123 (9th numbered list)			**Config Ref:**	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			🡐	🡐	**2xx response** addressed to UE A	
2		🡐	🡐		**2xx response** ✓ a P-Charging-Vector header ✗ an access-network-charging-info parameter	

Test Purpose						
Identifier:	**TP_IMS_5301_01**					
Summary:	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					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶126 (10th numbered list)			**Config Ref:**	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	🡒	🡒			**BYE**	
2		🡒	🡒		**BYE** ✓ 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							
Identifier:	**TP_IMS_5139_01**						
Summary:	In case the S-CSCF serves the calling 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						
IUT Role:	IMS A						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.5.1.2 ¶1 (item 1 and 2 in 1st numbered list)			**Config Ref:**	CF_INT_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 A has initiated a dialog with UE B	
	UE A	**NWK**	**IMS A**	**IMS B**	**UE B**		
Step	**Direction**					**Message**	**IF**
1		↰	↱			**network internal indication** that the lifetime of the last public user identity has expired	
2			↰		↱	**BYE** ✓ a Request URI ➔ Contact header value of UE B ✓ a To header ➔ the To header of the 200 response to initial INVITE ✓ a From header ➔ the From header of the initial INVITE ✓ a Call-ID header ➔ the Call-ID header of the initial ✓ a CSeq header ➔ CSeq header of the calling user incremented by one ✓ a Route header ➔ routing information towards the called user as stored for the dialog ✓ a Reason header ✓ further headers, based on local policy or the requested session release reason	
2	↰		↱			**BYE** ✓ a Request URI ➔ Contact address of UE A ✓ a To header ➔ the From header of the initial INVITE ✓ a From header ➔ the To header of the 200 response to initial ✓ a Call-ID header ➔ the Call-ID header of the initial INVITE ✓ a CSeq header ➔ CSeq header of the called user incremented by one ✓ a Route header ➔ routing information towards the calling user as stored for the dialog ✓ a Reason header ✓ further headers, based on local policy or the requested session release reason	

Test Purpose							
Identifier:	**TP_IMS_5139_02**						
Summary:	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						
IUT Role:	IMS B						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.5.1.2 ¶1 (item 3 and 4 in 1st numbered list)			**Config Ref:**	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						**BYE** ✓ a Request URI ➔ Contact header value of UE A ✓ a To header ➔ the From header of the initial INVITE ✓ a From header ➔ the To header of the 200 response to initial INVITE ✓ a Call-ID header ➔ the Call-ID header of the initial INVITE ✓ a CSeq header ➔ CSeq header of the called user incremented by one ✓ a Route header ➔ routing information towards the calling user as stored for the dialog ✓ a Reason header ✓ further headers, based on local policy or the requested session release reason	
2						**BYE** ✓ a Request URI ➔ Contact address of UE A ✓ a To header ➔ the To header of the 200 response to initial INVITE ✓ a From header ➔ the From header of the initial INVITE ✓ a Call-ID header ➔ the Call-ID header of the initial INVITE ✓ a CSeq header ➔ CSeq header of the calling user incremented by one ✓ a Route header ➔ routing information towards the calling user as stored for the dialog ✓ a Reason header ✓ further headers, based on local policy or the requested session release reason	

5.4.3 Dialog at I-CSCF

Test Purpose						
Identifier:	**TP_IMS_5131_01**					
Summary:	I-CSCF shall remove P-Charging-Function-Addresses header from 180 response to initial request					
IUT Role:	IMS B					
References:	TS 124 229 (V9.5.0) [1], clause 5.3.2.1 ¶62 (after note 11)			**Config Ref:**	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**		
Step	**Direction**				**Message**	**IF**
1			⇦	⇦	**180 response** addressed to UE A	
2		⇦	⇦		**180 response** × a P-Charging-Function-Addresses header	

Test Purpose						
Identifier:	**TP_IMS_5131_02**					
Summary:	I-CSCF shall remove P-Charging-Function-Addresses header from 200 response to initial request					
IUT Role:	IMS B					
References:	TS 124 229 (V9.5.0) [1], clause 5.3.2.1 ¶Clause 5.3.2.1 ¶62 (after note 11)			**Config Ref:**	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			⇦	⇦	**2xx response** addressed to UE A	
2		⇦	⇦		**2xx response** × a P-Charging-Function-Addresses header	

Test Purpose						
Identifier:	**TP_IMS_5132_01**					
Summary:	I-CSCF shall return an appropriate response to initial request to non-existent user					
IUT Role:	IMS B					
References:	TS 124 229 (V9.5.0) [1], clause 5.3.2.1 ¶54 (after 5th numbered list)			**Config Ref:**	CF_INT_CALL	
	Entities				**Condition**	
	UE A	**IMS A**	**IMS B**	**UE B**		
	✓	✓			UE A registered in IMS A	
			×		IMS B not configured with local policy to attempt request routeing	
			×	×	UE B not registered 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 non existing user in IMS B	
2a		⇦	⇦		**404 response**	
2b		⇦	⇦		**604 response**	

Test Purpose						
Identifier:	**TP_IMS_5133_01**					
Summary:	I-CSCF shall return unsuccessful response to initial request to non-registered user					
IUT Role:	IMS B					
References:	TS 124 229 (V9.5.0) [1], clause 5.3.2.1 ¶55 (before 6th numbered list)			**Config Ref:**	CF_INT_CALL	
	Entities				**Condition**	
	UE A	**IMS A**	**IMS B**	**UE B**		
	✓	✓			UE A registered in IMS A	
			×	×	UE B not registered in IMS B	
			×	×	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						
Identifier:	**TP_IMS_5135_01**					
Summary:	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					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.10.4.1 ¶7 (after note 4)			**Config Ref:**	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						
Identifier:	**TP_IMS_5137_01**					
Summary:	The IBCF shall perform encryption for topology hiding before an initial INVITE request is sent					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.10.4.2 ¶1 (items 7 & 8 in 1st numbered list)			**Config Ref:**	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	
2		→	←		**initial INVITE** ✓ a Via header ➔ the IBCF SIP URI of IMS A ✓ encrypted consecutive header entries ✓ a tokenized-by parameter ✓ a Route header ➔ the IBCF SIP URI of IMS A ✓ encrypted consecutive header entries ✓ a tokenized-by parameter	

Test Purpose						
Identifier:	**TP_IMS_5137_02**					
Summary:	The IBCF shall perform encryption for topology hiding before 180 response is sent					
IUT Role:	IMS B					
References:	TS 124 229 (V9.5.0) [1], clause 5.10.4.2 ¶1 (item 8 in 1st numbered list)			**Config Ref:**	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	
			✓		IMS B configured for topology hiding	
	UE A	**IMS A**	**IMS B**	**UE B**		
Step	**Direction**				**Message**	**IF**
1			←	←	**180 response** addressed to UE A	
2		←	←		**180 response** ✓ Via header ➔ the IBCF SIP URI of IMS A ✓ encrypted consecutive header entries ✓ a tokenized-by parameter	

Test Purpose						
Identifier:	**TP_IMS_5137_03**					
Summary:	The IBCF shall perform encryption for topology hiding before 200 response is sent					
IUT Role:	IMS B					
References:	TS 124 229 (V9.5.0) [1], clause 5.10.4.2 ¶(item 8 in 1st numbered list)			**Config Ref:**	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		←	→		**200 response** ✓ a Via header ➔ the IBCF SIP URI of IMS A ✓ encrypted consecutive header entries ✓ a tokenized-by parameter	

Test Purpose					
Identifier:	**TP_IMS_5137_04**				
Summary:	The IBCF shall perform encryption for topology hiding before an initial REGISTER request is sent				
IUT Role:	IMS A				
References:	TS 124 229 (V9.5.0) [1], clauses 5.10.4.1 and 5.10.4.2 ¶1 (1st numbered list)			**Config Ref:**	CF_ROAM_REG
	Entities			**Condition**	
	UE B	**IMS A**	**IMS B**		
		✓		IMS A configured for topology hiding	
	UE B	**IMS A**	**IMS B**		
Step	**Message**				**IF**
1	→	→		**unprotected REGISTER** addressed to IMS B	
2	→	→		**REGISTER** ✓ a Via header ➔ the IBCF SIP URI of IMS A ✓ encrypted consecutive header entries ✓ a tokenized-by parameter ✓ a Route header ➔ the IBCF SIP URI of IMS A ✓ encrypted consecutive header entries ✓ a tokenized-by parameter ✓ a Path header ➔ the IBCF SIP URI of IMS A ✓ encrypted consecutive header entries ✓ a tokenized-by parameter	

Test Purpose						
Identifier:	**TP_IMS_5404_01**					
Summary:	IBCF shall remove P-Charging-Function-Addresses header from initial INVITE request					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.10.2.2 ¶1 (item 8 in 1st numbered list)				**Config Ref:**	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						
Identifier:	**TP_IMS_5408_01**					
Summary:	The IBCF shall perform encryption for topology hiding before ACK request is sent					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.10.2.3 ¶1 (item 4 in 1st numbered list)				**Config Ref:**	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** ✓ a Via header ➔ the IBCF SIP URI of IMS A ✓ encrypted consecutive header entries ✓ a tokenized-by parameter ✓ a Route header ➔ the IBCF SIP URI of IMS A ✓ encrypted consecutive header entries ✓ a tokenized-by parameter	

Test Purpose						
Identifier:	**TP_IMS_5408_02**					
Summary:	The IBCF shall perform encryption for topology hiding before CANCEL request is sent					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.10.2.3 ¶1 (item 4 in 1st numbered list)			**Config Ref:**	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		↳	↱		**CANCEL** ✓ a Via header ➔ the IBCF SIP URI of IMS A ✓ encrypted consecutive header entries ✓ a tokenized-by parameter ✓ a Route header ➔ the IBCF SIP URI of IMS A ✓ encrypted consecutive header entries ✓ a tokenized-by parameter	

Test Purpose						
Identifier:	**TP_IMS_5408_03**					
Summary:	The IBCF shall perform encryption for topology hiding before BYErequest is sent					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.10.2.3 ¶1 (item 4 in 1st numbered list)			**Config Ref:**	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		↳	↱		**BYE** ✓ a Via header ➔ the IBCF SIP URI of IMS A ✓ encrypted consecutive header entries ✓ a tokenized-by parameter ✓ a Route header ➔ the IBCF SIP URI of IMS A ✓ encrypted consecutive header entries ✓ a tokenized-by parameter	

Test Purpose						
Identifier:	**TP_IMS_5408_04**					
Summary:	The IBCF shall perform encryption for topology hiding before subsequent INVITE request is sent					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.10.2.3 ¶1 (item 4 in 1st numbered list)			**Config Ref:**	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	→	←			**subsequent INVITE** addressed to UE B	
2		→	←		**subsequent INVITE** ✓ a Via header ➔ the IBCF SIP URI of IMS A ✓ encrypted consecutive header entries ✓ a tokenized-by parameter ✓ a Route header ➔ the IBCF SIP URI of IMS A ✓ encrypted consecutive header entries ✓ a tokenized-by parameter	

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

Test Purpose						
Identifier:	**TP_IMS_CONTENT_SHARE_01**					
Summary:	The IBCF shall pass content share specific information in the OPTIONS request					
IUT Role:	IMS A					
References:	Rich Communication Suite Release 2, Technical realization [7], clause 8.1			**Config Ref:**	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	→	←			**OPTIONS** addressed to UE B	
2		→	←		**OPTIONS** ✓ a Contact header ➔ +g.3gpp.cs-voice feature tag ✓ a Accept-Contact header ➔ +g.3gpp.cs-voice feature tag	

Test Purpose						
Identifier:	**TP_IMS_CONTENT_SHARE_02**					
Summary:	The IBCF shall pass content share specific information in the subsequent INVITE request					
IUT Role:	IMS A					
References:	Rich Communication Suite Release 2, Technical realization [7], clause 8.1			**Config Ref:**	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	→	←			**subsequent INVITE** addressed to UE B	
2		→	←		**subsequent INVITE** ✓ a Contact header ➔ +g.3gpp.cs-voice feature tag ✓ a Accept-Contact header ➔ +g.3gpp.cs-voice feature tag	

Test Purpose						
Identifier:	**TP_IMS_CONTENT_SHARE_03**					
Summary:	The IBCF shall transport content sharing rejection in 603 response					
IUT Role:	IMS A					
References:	Rich Communication Suite Release 2, Technical realization [7], clause 8.1			**Config Ref:**	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			←	←	**603 response**	
2		←	←		**603 response**	

Test Purpose						
Identifier:	**TP_IMS_CONTENT_SHARE_04**					
Summary:	The IBCF shall transport content sharing rejection in 603 response					
IUT Role:	IMS A					
References:	Rich Communication Suite Release 2, Technical realization [7], clause 8.1			**Config Ref:**	CF_INT_ROAM	
	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		←		←	**603 response**	
2		→	←		**603 response**	

5.5 Messaging Procedures

5.5.1 Messaging at P-CSCF

Test Purpose						
Identifier:	**TP_IMS_5050_01**					
Summary:	When the P-CSCF receives a MESSAGE request from a UE for which a Service-Route header list exists without topology hiding					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.2.6.3.3 ¶(1st numbered list)			**Config Ref:**	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 not configured for topology hiding	
	UE A	**IMS A**	**IMS B**	**UE B**		
Step	**Direction**				**Message**	**IF**
1					**MESSAGE**	
2					**MESSAGE** ✓ 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						
Identifier:	**TP_IMS_5097_05**					
Summary:	S-CSCF must inserts orig-ioi parameter, remove access-network-charging-info parameter before sending MESSAGE over NNI					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶1			**Config Ref:**	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 not configured for topology hiding	
	UE A	**IMS A**	**IMS B**	**UE B**		
Step	**Direction**				**Message**	**IF**
1					**MESSAGE** addressed to UE B	
2					**MESSAGE** × 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						
Identifier:	**TP_IMS_5097_06**					
Summary:	S-CSCF inserts a second P-Asserted-Identity header indicating a tel URI					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶11 (item 9 in 1st numbered list)			**Config Ref:**	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					**MESSAGE** ✓ a P-Asserted-Identity header ➔ the SIP URI of UE A ✓ a P-Asserted-Identity header ➔ the Tel URI of UE A	

Test Purpose						
Identifier:	**TP_IMS_5097_07**					
Summary:	S-CSCF inserts a second P-Asserted-Identity header indicating a SIP URI					
IUT Role:	IMS A					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶11 (item 9 in 1st numbered list)			**Config Ref:**	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					**MESSAGE** ✓ a P-Asserted-Identity header ➔ the SIP URI of UE A ✓ a P-Asserted-Identity header ➔ the Tel URI of UE A	

Test Purpose							
Identifier:	**TP_IMS_5097_08**						
Summary:	S-CSCF uses ENUM/DNS to translate Tel URIs to SIP URIs in MESSAGE requests						
IUT Role:	IMS A						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶11 (item 10 in1st numbered)			**Config Ref:**	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							
Identifier:	**TP_IMS_5097_10**						
Summary:	MESSAGE handling by S-CSCF with matching filter criteria AS						
IUT Role:	IMS B						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶11 (item 5 and 8 in 1st numbered list)			**Config Ref:**	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						
Identifier:	**TP_IMS_5108_01**					
Summary:	Standalone request; terminated at the served user					
IUT Role:	IMS B					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶5 (1st numbered list)			**Config Ref:**	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						
Identifier:	**TP_IMS_5108_02**					
Summary:	Standalone request; terminated at the served user					
IUT Role:	IMS B					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶5 (1st numbered list)			**Config Ref:**	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						
Identifier:	**TP_IMS_5108_06**					
Summary:	S-CSCF rejects barred users on MESSAGE					
IUT Role:	IMS B					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶6 (item 1 in1st numbered list)			**Config Ref:**	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						
Identifier:	**TP_IMS_5117_01**					
Summary:	S-CSCF remove access-network-charging-info parameter from 1xx response to standalone transaction					
IUT Role:	IMS B					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶100 (item 2 in 5th numbered list)			**Config Ref:**	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						
Identifier:	**TP_IMS_5117_02**					
Summary:	S-CSCF remove access-network-charging-info parameter from 2xx response to standalone transaction					
IUT Role:	IMS B					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶100 (item 2 in 5th numbered list)			**Config Ref:**	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						
Identifier:	**TP_IMS_5117_05**					
Summary:	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					
IUT Role:	IMS B					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶(item 1 in 5th numbered list)				**Config Ref:**	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**		
Step	**Direction**				**Message**	**IF**
1			🡸	🡺	**1xx response** addressed to UE A	
2		🡸	🡺		**1xx response** ✓ a P-Asserted-Identity header ➔ the tel URI of UE B ✓ a P-Asserted-Identity header ➔ a SIP URI of UE B	

Test Purpose						
Identifier:	**TP_IMS_5117_06**					
Summary:	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					
IUT Role:	IMS B					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶100 (item 1 in 5th numbered list)				**Config Ref:**	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**		
Step	**Direction**				**Message**	**IF**
1			🡸	🡺	**2xx response** addressed to UE A	
2		🡸	🡺		**2xx response** ✓ a P-Asserted-Identity header ➔ the tel URI of UE B ✓ a P-Asserted-Identity header ➔ the SIP URI of UE B	

Test Purpose							
Identifier:	**TP_IMS_5118_01**						
Summary:	S-CSCF include term-ioi parameter and restores orig-ioi in 200 responses to standalone requests						
IUT Role:	IMS B						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶105 (item 2 in 6th numbered list)				**Config Ref:**	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		←	→		**200 response** ✓ a P-Charging-Vector header ✓ an orig-ioi parameter ➔ operator identifier of IMS A ✓ a term-ioi parameter ➔ operator identifier of IMS B		

5.6 Application Server Handling Procedures

5.6.1 Application Server Handling at S-CSCF

Test Purpose							
Identifier:	**TP_IMS_5097_09**						
Summary:	Initial request for a dialog handling by S-CSCF with matching filter criteria AS						
IUT Role:	IMS B						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶11 (items 5 and 8 in 1st numbered list)				**Config Ref:**	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			→	→		**initial INVITE** ✓ a Route header ➔ the SIP URI of AS B ✓ a P-Charging-Function-Addresses header ✓ a P-Charging-Vector header ✓ an orig-ioi parameter ➔ operator identifier of IMS A × a term-ioi parameter ✓ access-network-charging-info	

Test Purpose							
Identifier:	**TP_IMS_5097_13**						
Summary:	Standalone request handling by S-CSCF with matching filter criteria AS						
IUT Role:	IMS B						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶11 (items 5 and 8 in 1st numbered list)			**Config Ref:**	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		↯	⇗			**PUBLISH** sent by UE_B	
2			↯	⇗		**PUBLISH** ✓ a Route header ➔ the SIP URI of AS B ✓ a P-Charging-Function-Addresses header ✓ a P-Charging-Vector header ✓ an orig-ioi parameter ➔ operator identifier of IMS A × a term-ioi parameter ✓ access-network-charging-info	

Test Purpose							
Identifier:	**TP_IMS_5097_14**						
Summary:	Initial request for a dialog handling by S-CSCF with matching filter criteria AS						
IUT Role:	IMS A						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶11 (items 5 and 8 in 1st numbered list)			**Config Ref:**	CF_IP_TV		
	Entities					**Condition**	
	UE A	**IMS A**		**AS A**			
	✓	✓				UE A registered in IMS A	
		✓		✓		IMS A configured with filter criteria to contact AS A	
	UE A	**IMS A**		**AS A**			
Step	**Direction**					**Message**	**IF**
1		↯		⇗		**SUBSCRIBE** ✓ a Route header ➔ the SIP URI of AS A ✓ a P-Charging-Function-Addresses header ✓ a P-Charging-Vector header ✓ an orig-ioi parameter ➔ operator identifier of IMS A × a term-ioi parameter ✓ access-network-charging-info	

Test Purpose							
Identifier:	**TP_IMS_5108_03**						
Summary:	Request for a initial dialog terminated at the served user						
IUT Role:	IMS B						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶5 (item 4 in 1st numbered list)				**Config Ref:**	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			↳	⇗		**INVITE** ✓ 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-ioi parameter ➔ operator identifier of IMS A × a term-ioi parameter	

Test Purpose							
Identifier:	**TP_IMS_5108_04**						
Summary:	Standalone request; terminated at the served user						
IUT Role:	IMS B						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶5 (item 4 in1st numbered list)				**Config Ref:**	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			↳	⇗		**MESSAGE** ✓ 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-ioi parameter ➔ operator identifier of IMS A × a term-ioi parameter	

Test Purpose							
Identifier:	**TP_IMS_5108_07**						
Summary:	Request for a initial dialog terminated at the served user (SUBSCRIBE)						
IUT Role:	IMS B						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶(item 4 in 1st numbered list)					**Config Ref:**	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			↳	⇗		**SUBSCRIBE** ✓ 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-ioi parameter ➔ operator identifier of IMS A × a term-ioi parameter	

Test Purpose						
Identifier:	**TP_IMS_5109_01**					
Summary:	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					
IUT Role:	IMS B					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶76 (after 2nd numbered list)				**Config Ref:**	CF_INT_CALL CF_ROAM_CALL
	Entities				**Condition**	
	UE A	**IMS A**	**IMS 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**	**UE B**		
Step	**Direction**				**Message**	**IF**
1		↳	⇗		**initial INVITE** addressed to UE B	
2a		↰	↲		**408 response**	
2b		↰	↲		**5xx response**	

Test Purpose							
Identifier:	**TP_IMS_5110_01**						
Summary:	Forward 200 from AS on final response to an initial request for a dialog or a standalone request						
IUT Role:	IMS A						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶79 (after 6th dashed list)					**Config Ref:**	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						
Identifier:	**TP_IMS_5114_01**					
Summary:	S-CSCF should turn down initial dialog request when terminated at the not registered served user					
IUT Role:	IMS B					
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶85 (item 3 in 3rd numbered list)			**Config Ref:**	CF_INT_CALL CF_ROAM_CALL	
	Entities				**Condition**	
	UE A	**IMS A**	**IMS B**	**UE B**		
	✓		✓		UE A registered in IMS B	
				×	UE B not registered	
			×		IMS B not configured with filter criteria to contact any AS	
	UE A	**IMS A**	**IMS B**	**UE B**		
Step	**Direction**				**Message**	**IF**
1		→	→		**initial INVITE** addressed to UE B	
2		←	←		**4xx response**	

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

Test Purpose							
Identifier:	**TP_IMS_5115_07**						
Summary:	S-CSCF include term-ioi parameter and restores orig-ioi in 1xx responses from AS to initial requests in terminating network						
IUT Role:	IMS B						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶89 (4th numbered list)				**Config Ref:**	CF_ROAM_AS CF_INT_AS	
	Entities					**Condition**	
	UE A	**IMS A**	**IMS B**	**AS B**	**UE 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	
	UE A	**IMS A**	**IMS B**	**AS B**	**UE B**		
Step	**Direction**					**Message**	**IF**
1			←	←		**1xx response** addressed to UE A	
2		←	←			**1xx response** ✓ 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							
Identifier:	**TP_IMS_5115_08**						
Summary:	S-CSCF include term-ioi parameter and restores orig-ioi in 2xx responses from AS to initial requests in terminating network						
Clause:							
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶89 (4th numbered list)			**Config Ref:**		CF_ROAM_AS CF_INT_AS	
IUT Role:	IMS B			**Test Case:**		**TC_IMS_5115_08**	
	Entities					**Condition**	
	UE A	**IMS A**	**IMS B**	**AS B**	**UE B**		
	✓	✓				UE A registered in IMS A	
	✓			✓		AS B has received an initial request for a dialog from UE A	
	UE A	**IMS A**	**IMS B**	**AS B**	**UE B**		
Step	**Direction**					**Message**	**IF**
1			🡸	🡻		**2xx response** addressed to UE A	
2		🡸	🡻			**2xx response** ✓ 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							
Identifier:	**TP_IMS_5118_02**						
Summary:	S-CSCF include term-ioi parameter and restores orig-ioi in 200 responses from AS to standalone requests						
IUT Role:	IMS B						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶106 (item 2 in 6th numbered list)			**Config Ref:**		CF_ROAM_AS CF_INT_AS	
	Entities					**Condition**	
	UE A	**IMS A**	**IMS B**	**AS B**	**UE B**		
	✓	✓				UE A registered in IMS A	
			✓	✓		IMS B configured with filter criteria to contact AS B	
	✓			✓		AS B has received a standalone request from UE A	
	UE A	**IMS A**	**IMS B**	**AS B**	**UE B**		
Step	**Direction**					**Message**	**IF**
1			🡸	🡻		**200 response** addressed to UE A	
2		🡸	🡻			**200 response** ✓ 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							
Identifier:	**TP_IMS_5302_01**						
Summary:	The S-CSCF shall retain the access-network-charging-info parameter in the P-Charging-Vector header a 1xx or 2xx response to AS						
IUT Role:	IMS B						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶(after 11th numbered list)					**Config Ref:**	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**		
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							
Identifier:	**TP_IMS_5302_02**						
Summary:	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						
IUT Role:	IMS B						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.3 ¶(after 11th numbered list)					**Config Ref:**	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 not within the trust domain	
	UE A	**IMS A**	**IMS B**	**AS 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 (TO BE REVISITED)					
Identifier:	**TP_IMS_5206_01**				
Summary:	REGISTER request if there is at least on AS that matches Filter Criteria				
IUT Role:	IMS B				
References:	TS 124 229 (V9.5.0) [1], clause 5.4.1.2.2F ¶15 (before note 3)		**Config Ref:**	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	⇦		⇨	**protected REGISTER** ✓ 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	⇩	⇗		**third party REGISTER** ✓a P-Access-Network-Info header ✓a P-Visited-Network-ID header	
3	⇦	⇨		**200 response**	

Test Purpose							
Identifier:	**TP_IMS_5308_01**						
Summary:	Retain the access-network-charging-info parameter from the P-Charging-Vector header in 180 to AS						
IUT Role:	IMS A						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.4.2.2 ¶2				**Config Ref:**	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	⇩		⇗			**180 response** ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter	
2		⇦	⇨			**180 response** ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter	

Test Purpose							
Identifier:	**TP_IMS_5308_02**						
Summary:	Retain the access-network-charging-info parameter from the P-Charging-Vector header in 200 to AS						
IUT Role:	IMS A						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.4.2.2 ¶2			**Config Ref:**	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						**200 response** ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter	
2						**200 response** ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter	

Test Purpose							
Identifier:	**TP_IMS_5310_01**						
Summary:	Retaining the access-network-charging-info parameter from the P-Charging-Vector						
IUT Role:	IMS B						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.6.1.2 ¶1			**Config Ref:**	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						**subsequent INVITE** ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter	
2						**INVITE** ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter	

Test Purpose							
Identifier:	**TP_IMS_5310_02**						
Summary:	Not retaining the access-network-charging-info parameter from the P-Charging-Vector						
IUT Role:	IMS B						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.6.1.2 ¶1					**Config Ref:**	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	
				×		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		↳	↛			**subsequent INVITE** ✓ P-Charging-Vector header ✓ an access-network-charging-info parameter	
2			↳	↛		**INVITE** ✓ a P-Charging-Vector header ×✓ an access-network-charging-info parameter	

Test Purpose							
Identifier:	**TP_IMS_5310_03**						
Summary:	Retaining in UPDATE the access-network-charging-info parameter from the P-Charging-Vector						
IUT Role:	IMS B						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.6.1.2 ¶1					**Config Ref:**	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		↳	↛			**subsequent UPDATE** ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter	
2			↳	↛		**UPDATE** ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter	

Test Purpose							
Identifier:	**TP_IMS_5310_04**						
Summary:	Not retaining in UPDATE the access-network-charging-info parameter from the P-Charging-Vector						
IUT Role:	IMS B						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.6.1.2 ¶1			**Config Ref:**	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 not within the trust domain of IMS B	
	UE A	**IMS A**	**IMS B**	**AS B**	**UE B**		
Step	**Direction**					**Message**	**IF**
1		↳	↛			**subsequent UPDATE** ✓ P-Charging-Vector header ✓ an access-network-charging-info parameter	
2			↳	↛		**UPDATE** ✓ a P-Charging-Vector header × an access-network-charging-info parameter	

Test Purpose							
Identifier:	**TP_IMS_5312_01**						
Summary:	Retaining the access-network-charging-info parameter from the P-Charging-Vector on 200 (OK) response						
IUT Role:	IMS B						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.6.1.3 ¶1			**Config Ref:**	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		↳	↛			**200 response** addressed to UE B ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter	
2			↳	↛		**200 response** ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter	

Test Purpose							
Identifier:	**TP_IMS_5313_01**						
Summary:	Retaining the access-network-charging-info parameter from the P-Charging-Vector on any SIP request						
IUT Role:	IMS B						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.6.1.3 ¶2			**Config Ref:**	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**	**IMSA**	**IMS B**	**UE B**		
Step	**Direction**					**Message**	**IF**
1			🡸	🡺		**a response** ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter	
2		🡸	🡺			**The response** ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter	

Test Purpose							
Identifier:	**TP_IMS_5313_02**						
Summary:	Not retaining the access-network-charging-info parameter from the P-Charging-Vector on any SIP request						
Clause:							
References:	TS 124 229 (V9.5.0) [1], clause 5.4.6.1.3 ¶2			**Config Ref:**	CF_INT_AS		
IUT Role:	IMS A			**Test Case:**	**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	
		×				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			🡸	🡺		**a response** ✓ a P-Charging-Vector header ✓ an access-network-charging-info parameter	
2		🡸	🡺			**the response** ✓ a P-Charging-Vector header × access-network-charging-info parameter	

Test Purpose							
Identifier:	**TP_IMS_5320_01**						
Summary:	S-CSCF is failing to receive a SIP response or receive 408 (Request Timeout) response or a 5xx response from the AS						
IUT Role:	IMS B						
References:	TS 124 229 (V9.5.0) [1], clause 5.4.3.2 ¶91 (after note 15)				**Config Ref:**	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**		
Step	**Direction**					**Message**	**IF**
1			⇦‖	‖⇨		**Any response**	
2a			⇦		⇨	**408 response**	
2b			⇦		⇨	**5xx response**	

5.7 MGCF tests for IMS-PSTN interconnection

Test Purpose					
Identifier:	**TP_IMS_MGCF_01**				
Summary:	MGCF shall send INVITE due to indication of an incoming call				
Clause:	TS 124 229 [1], clause 5.5.3.1.1				
References:	RQ_24.229_5.5.3.1.1		**Config Ref:**	CF_PSTN	
IUT Role:	MGCF		**Test Case:**	**TC_IMS_MGCF_01**	
	Entities			**Condition**	
	IMS_A	**IUT**	**PSTN**		
	✓		✓	IMS A and PSTN with peer-to-peer arrangement	
	IMS_A	**IUT**	**PSTN**		
Step	**Direction**			**Message**	**IF**
1		⇦	⇨	**initial** IAM	
2	⇦	⇨		**INVITE** ✓ 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					
Identifier:	**TP_IMS_MGCF_02**				
Summary:	MGCF shall send 100 response due to indication of an incoming INVITE				
Clause:	TS 124 229 [1], clause 5.5.3.1.2				
References:	RQ_24.229_5.5.3.1.2		**Config Ref:**	CF_PSTN	
IUT Role:	MGCF		**Test Case:**	**TC_IMS_MGCF_02**	
	Entities			**Condition**	
	IMS_A	**IUT**	**PSTN**		
	✓		✓	IMS A and PSTN with peer-to-peer arrangement	
	IMS_A	**IUT**	**PSTN**		
Step	**Direction**			**Message**	**IF**
1	⇨	⇨		**initial** INVITE	
2	⇦	⇨		**100 response**	

Test Purpose						
Identifier:	**TP_IMS_MGCF_03**					
Summary:	MGCF shall send 183 response codec found or not required					
Clause:	TS 124 229 [1], clause 5.5.3.1.2					
References:	RQ_24.229_5.5.3.1.2			**Config Ref:**	CF_PSTN	
IUT Role:	MGCF			**Test Case:**	**TC_IMS_MGCF_03**	
	Entities			**Condition**		
	IMS_A	**IUT**	**PSTN**			
	✓		✓	IMS A and PSTN with peer-to-peer arrangement		
	IMS_A	**IUT**	**PSTN**			
Step	**Direction**			**Message**		**IF**
1	⇘	⇗		**initial** INVITE		
2	⇖	⇙		**100 response**		
3	⇖	⇙		**183 response** ✓ Require header ➔ 100rel value ✓ a P-Charging-Vector header ✓ a term-ioi parameter ➔ the operator identifier of IMS A		

Test Purpose						
Identifier:	**TP_IMS_MGCF_05**					
Summary:	MGCF shall send UPDATE request					
Clause:	TS 124 229 [1], clause 5.5.3.2.1					
References:	RQ_24.229_5.5.3.2.1			**Config Ref:**	CF_PSTN	
IUT Role:	MGCF			**Test Case:**	**TC_IMS_MGCF_05**	
	Entities			**Condition**		
	IMS_A	**IUT**	**PSTN**			
	✓		✓	IMS A and PSTN with peer-to-peer arrangement		
	IMS_A	**IUT**	**PSTN**			
Step	**Direction**			**Message**		**IF**
1	⇘	⇗		**200 response** for PRACK conditions fulfilled		
2	⇖	⇙		**UPDATE**		

Test Purpose						
Identifier:	**TP_IMS_MGCF_06**					
Summary:	MGCF shall send 180 response due to indication of an ACM/CPG					
Clause:	TS 129 163 [6], clause 7.2.3.1.4, TS 124 229 [1], clause 5.5.3.2.2					
References:	RQ_29.163_7.2.3.1.4			**Config Ref:**	CF_PSTN	
IUT Role:	MGCF			**Test Case:**	**TC_IMS_MGCF_06**	
	Entities			**Condition**		
	IMS_A	**IUT**	**PSTN**			
	✓		✓	IMS A and PSTN with peer-to-peer arrangement		
	IMS_A	**IUT**	**PSTN**			
Step	**Direction**			**Message**		**IF**
1a		⇖	⇙	**ACM** ➔ subscriber free		
1b		⇖	⇙	**CPG** ➔ ALERTING		
2	⇖	⇙		**180 response**		

Test Purpose						
Identifier:	**TP_IMS_MGCF_07**					
Summary:	MGCF shall send 200 response due to indication of ANM					
Clause:	TS 129 163 [6], clause 7.2.3.1.5, TS 124 229 [1], clause 5.5.3.2.2					
References:	RQ_29.163_7.2.3.1.5			**Config Ref:**	CF_PSTN	
IUT Role:	MGCF			**Test Case:**	**TC_IMS_MGCF_07**	
	Entities			**Condition**		
	IMS_A	**IUT**	**PSTN**			
	✓		✓	IMS A and PSTN with peer-to-peer arrangement		
	IMS_A	**IUT**	**PSTN**			
Step	**Direction**			**Message**		**IF**
1		⇖	⇙	**ANM**		
2	⇖	⇙		**200 response**		

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

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

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

Test Purpose						
Identifier:	**TP_IMS_MGCF_11**					
Summary:	MGCF shall send CPG with a 'remote hold' Generic notification indicator on receipt of HOLD request from IMS					
Clause:	TS 129 163 [6], clause 7.4.10.1					
References:	RQ_29.163_7.4.10.1			**Config Ref:**	CF_PSTN	
IUT Role:	MGCF			**Test Case:**	**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**			
Step	**Direction**			**Message**		**IF**
1	←	←		**UPDATE** or a target refresh INVITE ✓ a SDP ➔ sendonly		
2		←	→	**CPG** ➔ remote hold		

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

Test Purpose						
Identifier:	**TP_IMS_MGCF_13**					
Summary:	MGCF shall send CPG with a 'remote hold' Generic notification indicator on receipt of HOLD request from IMS					
Clause:	TS 129 163 [6], clause 7.4.10.2					
References:	RQ_29.163_7.4.10.2			**Config Ref:**	CF_PSTN	
IUT Role:	MGCF			**Test Case:**	**TC_IMS_MGCF_13**	
	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**			
Step	**Direction**			**Message**		**IF**
1		↙	↙	**CPG** ➔ remote hold		
2	↙	↙		**UPDATE** or a target refresh INVITE ✓ a SDP ➔ sendonly		

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

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

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

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

5.8 ENUM tests for Tel-URI Resolution

Test Purpose							
Identifier:	**TP_IMS_ENUM_01**						
Summary:	The ENUM DB resolves a Tel URI into a SIP URI						
IUT Role:	IMS A						
References:	TS124 229 (V9.5.0) [1], clause 5.4.3.2 ¶11 (item 10 1st numbered list)			**Config Ref:**		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	↯	⇗				**initial INVITE** addressed to UE B ✓ a Request URI ➔ a Tel URI	
2		↯	⇗			**NAPTR Query** ✓ the derived Tel URI E.164 Number	
3		⇦	⇦			**NAPTR Response** ✓ 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	

Annex A (normative): Zip file with TPLan code

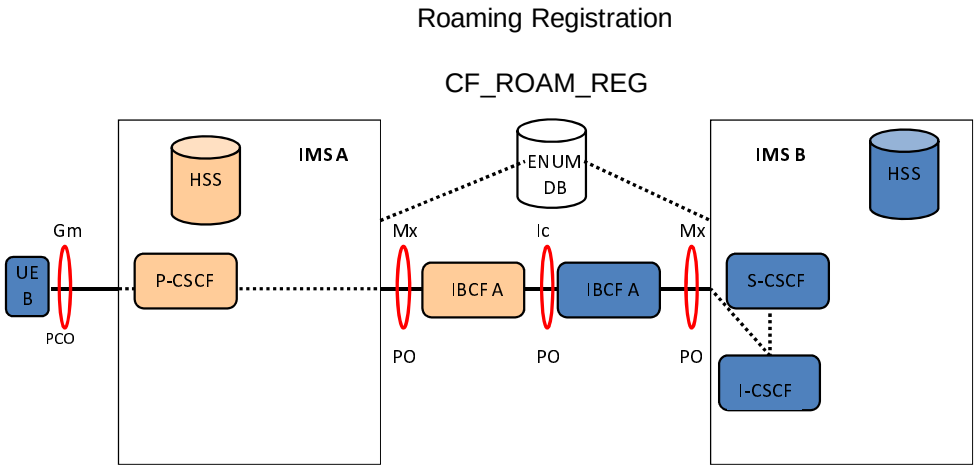
The test purposes defined in the present document have been automatically generated from the TPLan text files in the archive file ts_18601101v040101p0.zip which accompanies the present document. The raw text files has been converted to a symbolic table format to allow better readability.

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.

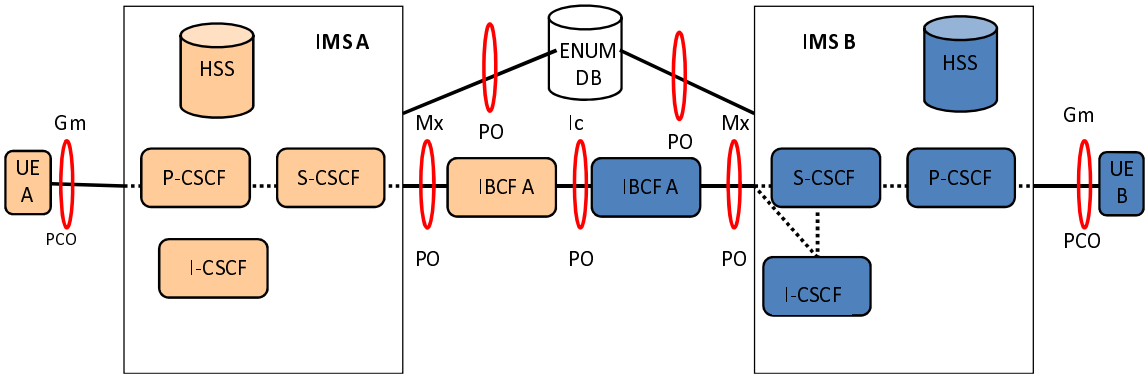


Precondition:
Different network operators performing origination and termination, UE_B roaming in visited network A (ROAM). UE_B not yet registered (REG), neither UE_A nor AS involved, a common interconnect ENUM DB and local ENUM is involved, IBCF is involved but no topology hiding performed.
Test configuration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

Interworking Call

CF_INT_CALL



Precondition:

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

Test configuration for:

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

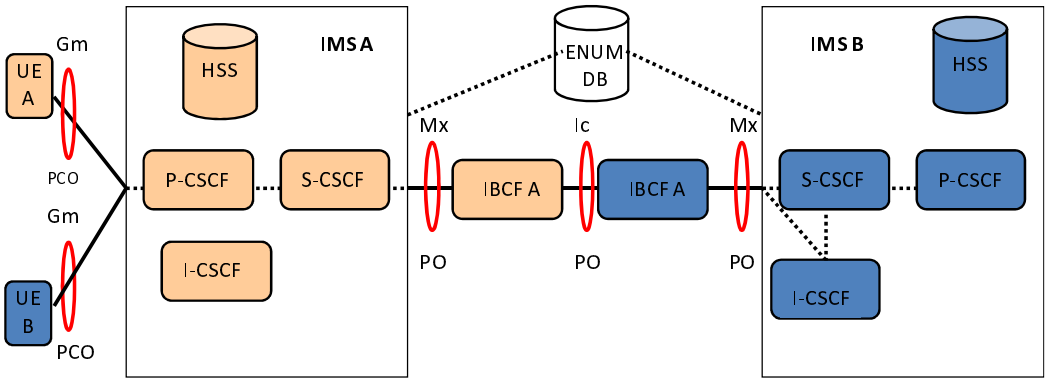
Example:

Initial INVITE in IMS VoIP voice call from UE_A to UE_B

Figure B.2: CF_INT_CALL

Roaming Call

CF_ROAM_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

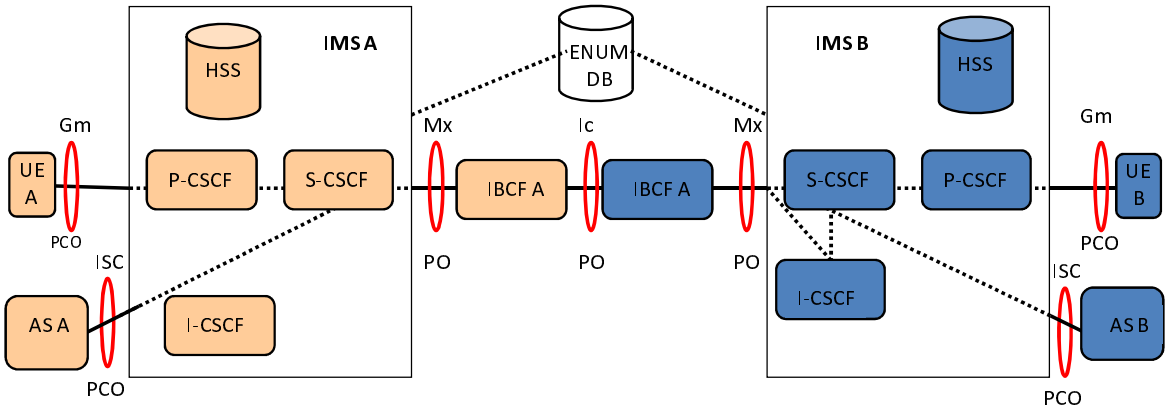
Example:

Initial INVITE in IMS VoIP voice call from UE_B to UE_A

Figure B.3: CF_ROAM_CALL

Interworking Application Server

CF_INT_AS



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

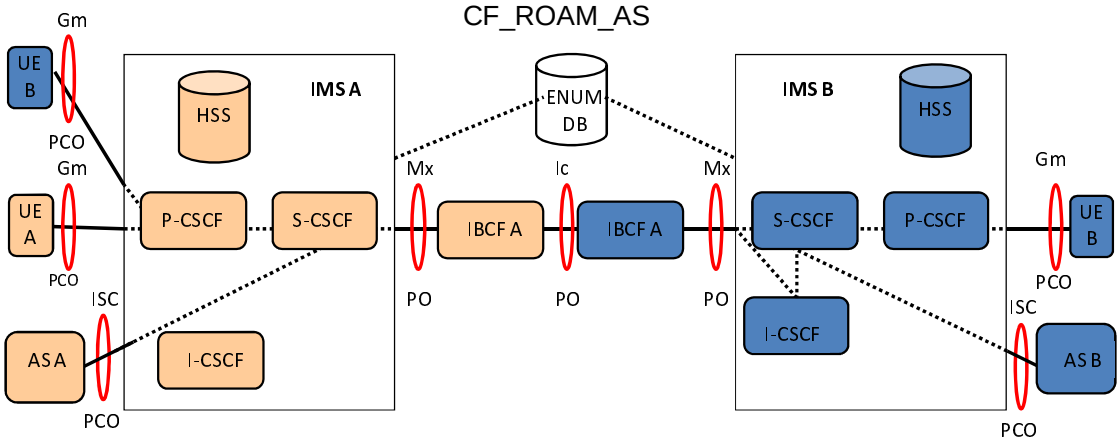
Example:

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

Figure B.4: CF_INT_AS

Roaming Application Server

CF_ROAM_AS



Precondition:

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

Test configuration for:

Requests and responses between AS_B and UEs

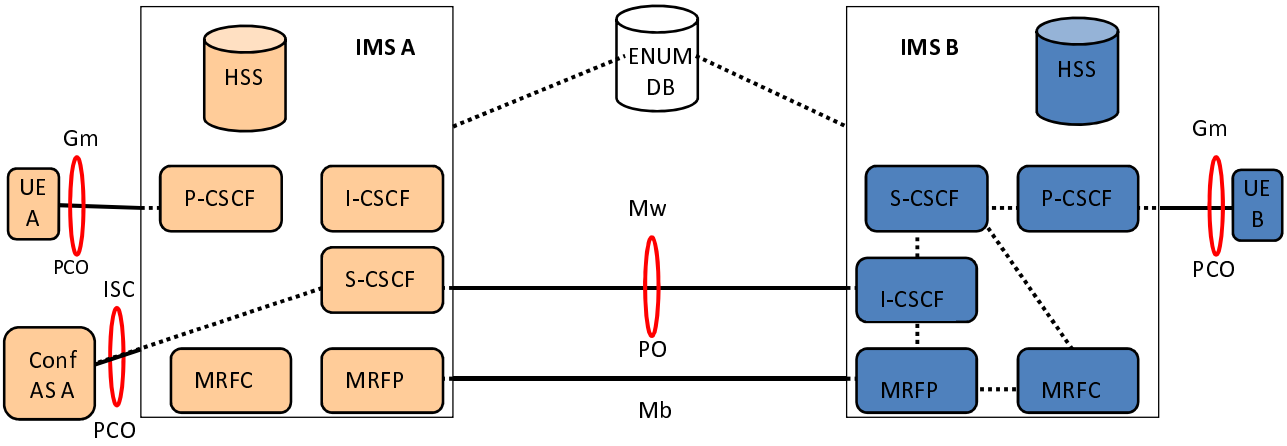
Example:

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

Figure B.5: CF_ROAM_AS

Interworking Conference Server

CF_INT_CONF_AS



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)

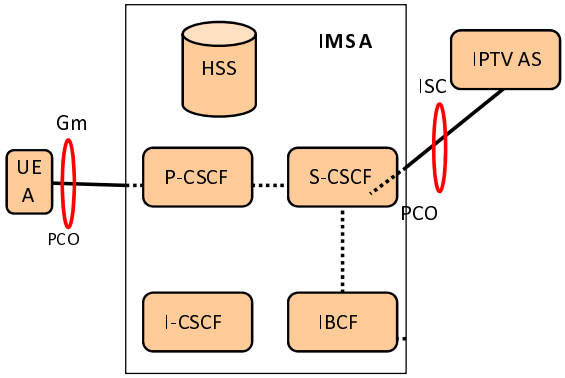
Example:

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

IPTV

CF_IPTV



Precondition:

UE_A registered in home network, IPTV_AS involved

Test configuration for:

Requests and responses between UE_A and IPTV AS

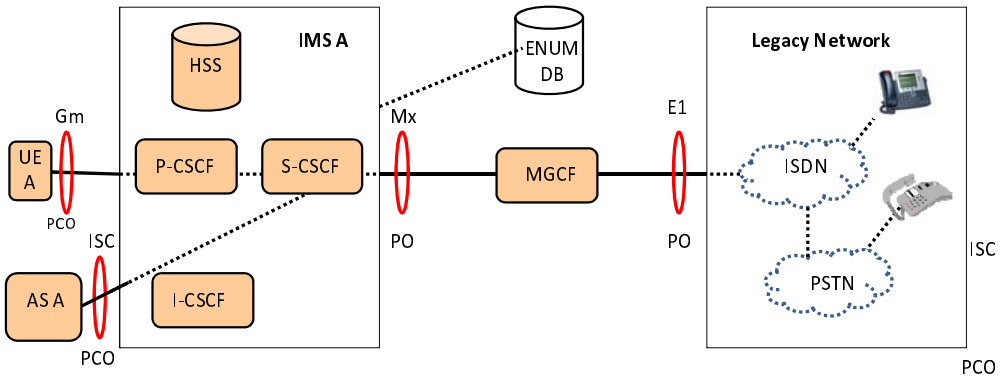
Example:

Initial INVITE from UE_A to initiate an IPTV Broadcast session

Figure B.7: CF_IPTV

PSTN Interworking

CF_PSTN



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

History

Document history		
V1.0.0	April 2008	Publication
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V4.1.1	October 2011	Publication