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Core Network and Interoperability Testing (INT);
VoLTE/ViLTE interoperability test description over 4G/early 5G in physical/virtual environments;
(3GPP™ Release 15);
Part 1: Test Purposes (TP) and
Protocol Implementation Conformance Statement (PICS)
for VoLTE/ViLTE interoperability

Reference
RTS/INT-00168-1

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Foreword

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

The present document is part 1 of a multi-part deliverable covering the interoperability test purposes and PICS for the VoLTE/ViLTE over 4G/early 5G in physical/virtual environments, as identified below:

Part 1: "Test Purposes (TP) and Protocol Implementation Conformance Statement (PICS) for VoLTE/ViLTE interoperability";

Part 2: "Test Descriptions for VoLTE/ViLTE interoperability";

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

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

1 Scope

The present document defines VoLTE/ViLTE interoperability test purposes and PICS. The VoLTE/ViLTE interoperability test purposes cover the test scenarios within single-network configuration over 4G/early 5G in physical/virtual environments, as well as interconnect and roaming test scenarios within multiple-network configurations. Test purposes provide monitoring points and test specifications in prose details with focus on different interworking and interoperability interfaces using SIP, Diameter protocols and checks of ENUM Transactions. Emergency call and enhanced eCall are not in scope of the present document.

2 References

2.1 Normative 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 referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at https://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.

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

[1] ETSI TS 124 229 (V15.6.0): "Digital cellular telecommunications system (Phase 2+) (GSM); 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 15.6.0 Release 15)".

[2] ETSI TS 129 165: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; 5G; Inter-IMS Network to Network Interface (NNI) (3GPP TS 29.165 Release 15)".

[3] ETSI TS 129 228 (V15.1.0): "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; IP Multimedia (IM) Subsystem Cx and Dx Interfaces; Signalling flows and message contents (3GPP TS 29.228 version 15.1.0 Release 15)".

[4] ETSI TS 129 229 (V15.0.0): "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Cx and Dx interfaces based on the Diameter protocol; Protocol details (3GPP TS 29.229 version 15.0.0 Release 15)".

[5] ETSI TS 132 260: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Charging management; IP Multimedia Subsystem (IMS) charging (3GPP TS 32.260 Release 15)".

[6] ETSI TS 132 299: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Telecommunication management; Charging management; Diameter charging applications (3GPP TS 32.299 Release 15)".

[7] ETSI TS 129 214: "Universal Mobile Telecommunications System (UMTS); LTE; 5G; Policy and charging control over Rx reference point (3GPP TS 29.214 Release 15)".

[8] ETSI TS 129 212 (V15.3.0): "Universal Mobile Telecommunications System (UMTS); LTE; Policy and Charging Control (PCC); Reference points (3GPP TS 29.212 version 15.3.0 Release 15)".

[9] ETSI TS 129 272: "Universal Mobile Telecommunications System (UMTS); LTE; 5G; Evolved Packet System (EPS); Mobility Management Entity (MME) and Serving GPRS Support Node (SGSN) related interfaces based on Diameter protocol (3GPP TS 29.272 Release 15)".

[10] ETSI TS 129 215: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Policy and Charging Control (PCC) over S9 reference point; Stage 3 (3GPP TS 29.215 Release 15)".

[11] ETSI TS 129 328 (V15.3.0): "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; IP Multimedia (IM) Subsystem Sh interface; Signalling flows and message contents (3GPP TS 29.328 version 15.3.0 Release 15)".

[12] ETSI TS 129 329: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; 5G; Sh interface based on the Diameter protocol; Protocol details (3GPP TS 29.329 Release 15)".

[13] ETSI ES 203 119-4: "Methods for Testing and Specification (MTS); The Test Description Language (TDL); Part 4: Structured Test Objective Specification (Extension)".

[14] IETF RFC 3261: "SIP: Session Initiation Protocol".

2.2 Informative 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 referenced document (including any amendments) applies.

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

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

[i.1] ISO/IEC 9646-1: "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 1: General concepts".

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms given in ETSI TS 124 229 [1], ETSI TS 129 165 [2], ETSI TS 129 228 [3], ETSI TS 129 229 [4], ETSI TS 132 260 [5], ETSI TS 132 299 [6], ETSI TS 129 214 [7], ETSI TS 129 212 [8], ETSI TS 129 272 [9], ETSI TS 129 215 [10], ETSI TS 129 328 [11], ETSI TS 129 329 [12] and the following apply:

Abstract Test Method (ATM): Refer to ISO/IEC 9646-1-1 [i.1].

Abstract Test Suite (ATS): Refer to ISO/IEC 9646-1-1 [i.1].

Implementation Under Test (IUT): Refer to ISO/IEC 9646-1-1 [i.1].

Test Purposes (TP): Refer to ISO/IEC 9646-1-1 [i.1].

3.2 Symbols

Void.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI TS 124 229 [1], ETSI TS 129 165 [2], ETSI TS 129 228 [3], ETSI TS 129 229 [4], ETSI TS 132 260 [5], ETSI TS 132 299 [6], ETSI TS 129 214 [7], ETSI TS 129 212 [8], ETSI TS 129 272 [9], ETSI TS 129 215 [10], ETSI TS 129 328 [11], ETSI TS 129 329 [12] and the following apply:

3GPP	3rd Generation Partnership Project
ACK	SIP 'ACK' message
ATS	Abstract Test Suite
CF	(Test) Configuration
CX	Cx interface
DB	Data Base
ENUM	E.164 Number Mapping
EPC	Evolved Packet Core
GM	Gm interface
GX	Gx interface
IC	Ic interface
ICSCF	Interrogating Call Session Control Function
IUT	Implementation Under Test
MW	Mw interface
NAPTR	Naming Authority Pointer Record
PCSCF	Proxy Call Session Control Function
PGW	PDN Gateway
PICS	Protocol Implementation Conformance Statement
RX	Rx interface
SCSCF	Serving Call Session Control Function
SH	Sh interface
TAS	Telephony Application Server
TDL-TO	TDL Test Objectives
TP	Test Purposes
TSS	Test Suite Structure

4 Protocol Implementation Conformance Statement (PICS)

The purpose of a PICS pro forma is to allow the static conformance review of an implementation. For an implementation claiming to be conforming to the requirements of a given base protocol specification all, specified functions need to be identified which an IUT shall support, those which are recommended or optional and those which are conditional based on the presence of other functions. The totality of those static requirement are usually listed in PICS pro forma tables in the form of questions which need to be answered by the provider of an implementation. During the static conformance review, the answers to all PICS questions are verified and the conformance of an implementation to a base protocol specification can be determined. However, in the context of an interoperability testing exercise this first role has no relevance.

A second role of the PICS pro forma is the use of PICS items as test selection criteria for test purposes. This is of importance for optional features within a protocol specification. If an implementation does not support an optional feature it is still conformant to the specification and will not fail the static conformance review. However, testing such an unsupported feature with a test purpose is not applicable to that implementation and the PICS item is used to deselect that test purpose during a test run.

In the case of the present technical specification, as the static conformance of an implementation is not the main objective the test purposes defined and listed in clause 7 of the present document could have still contained references to PICS items. Those would have been used for test selection purposes by identifying which functions an IUT supports when performing interoperability testing. However, during the development of the TPs no PICS items were identified for test selection. This is mainly due to the fact that the interoperability testing concentrates on the main, i.e. mandatory capabilities at the interfaces under testing.

For information, annex B lists references to the PICS pro forma specifications for all interfaces under testing.

5 Test Configurations

5.1 General

Test purposes of the present document address the VoLTE/ViLTE functional entities that are accessible via the following standardized interfaces:

- SIP interfaces: Gm, Mw, Ic(Ici), and ISC;
- Diameter interfaces: Rx, Gx, S6a, S9, Sh, Cx;
- Voice interfaces: RTP, RTCP.

5.2 Configuration CF_VxLTE_INT

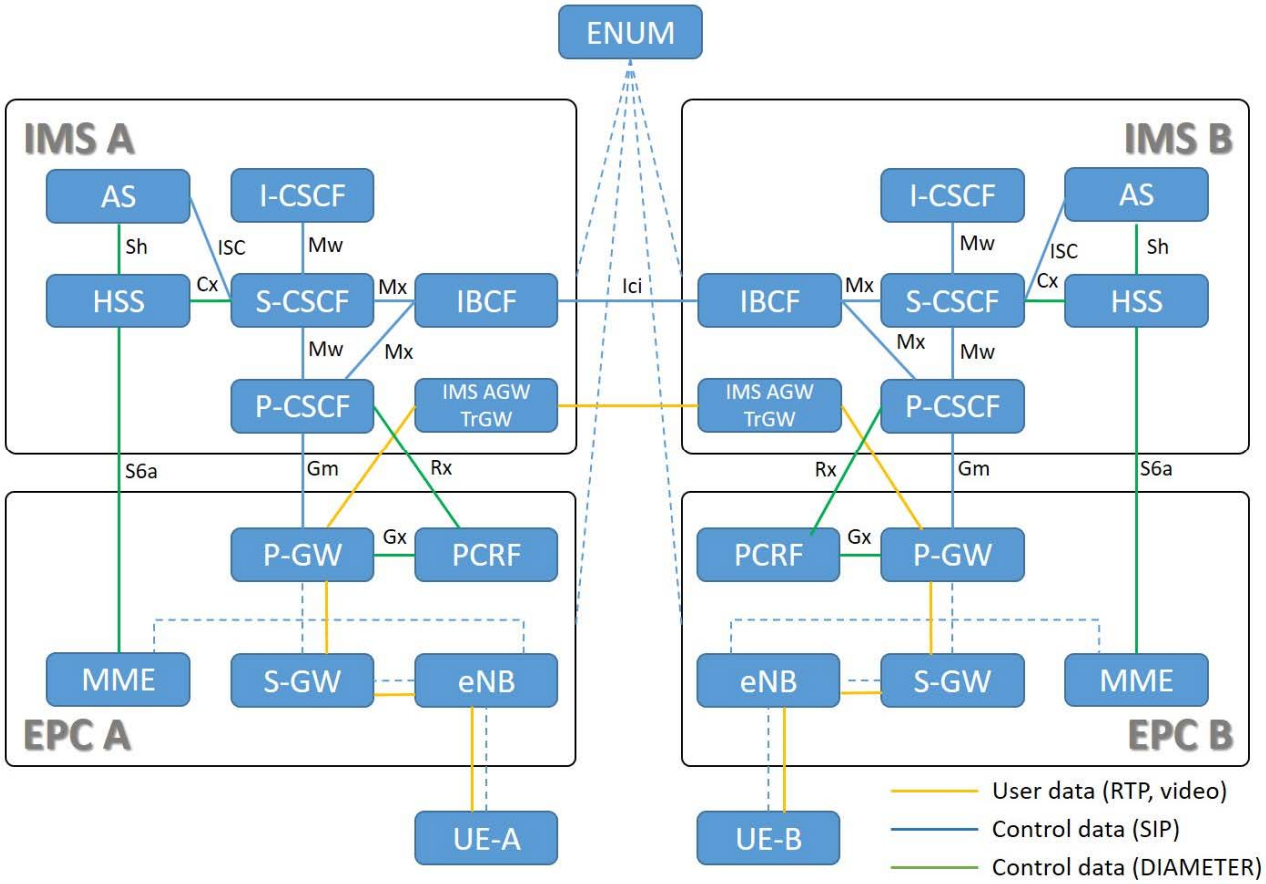

Figure 1: Configuration CF_VxLTE_INT

Configuration CF_VxLTE_INT is used for two peer networks where users are attached and registered to their home network. The suffix INT stands for home interoperability scenario. UE-A connects to home network A represented by EPC A and IMS A. UE-B connects to home network B represented by EPC B and IMS B. Attachment, Registration, Detachment and Deregistration procedures of each user are performed locally in their own home network. For Call establishment, call modification and call release procedures signalling is going between the two networks over the Ici interface and therefore all related TDs are named as home interoperability tests.

5.3 Configuration CF_VxLTE_RMI_A

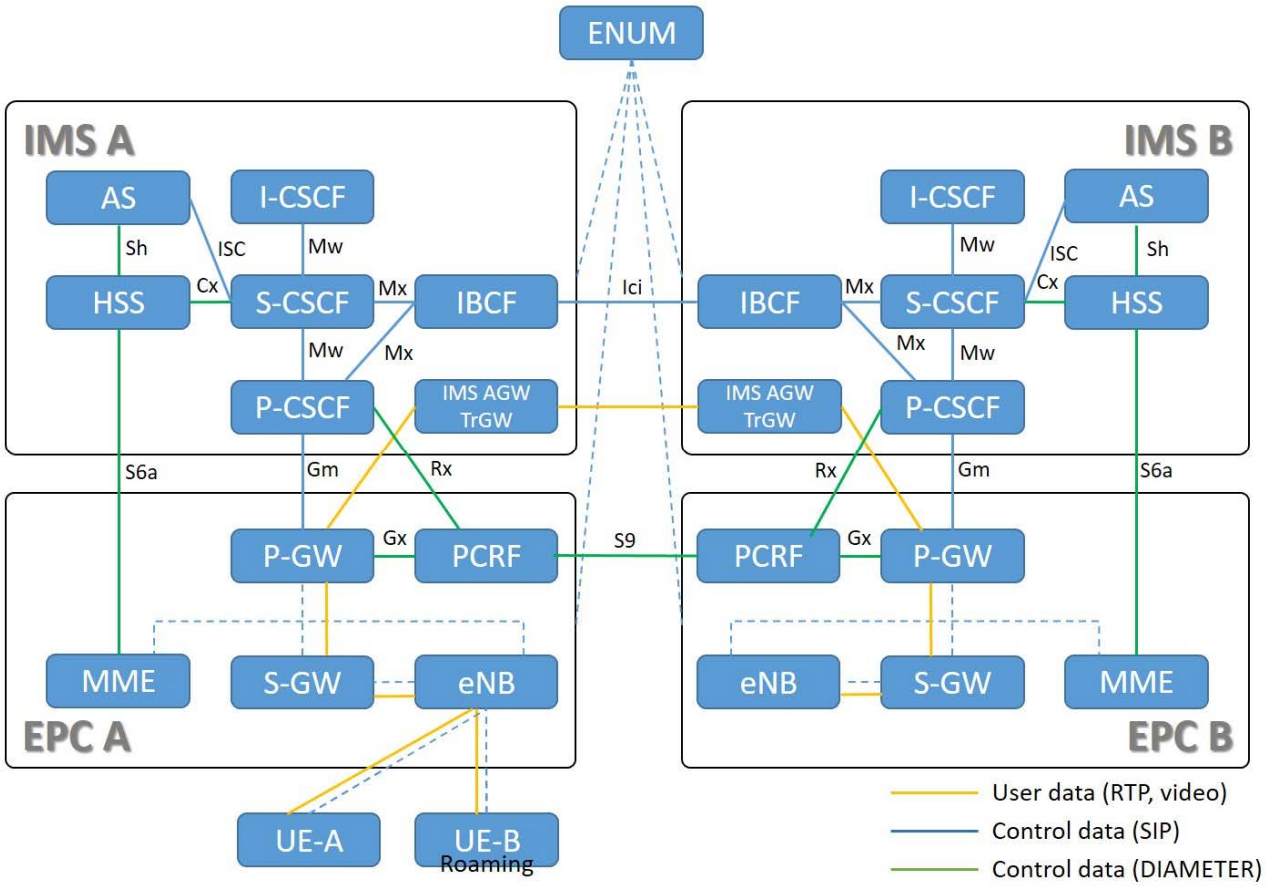

Figure 2: Configuration CF_VxLTE_RMI_A

Configuration CF_VxLTE_RMI_A describes the first roaming scenario. Within CF_VxLTE_RMI_A, UE-A connects to its home network A represented by EPC A and IMS A. UE-B connects to the visited network A attached to the EPC A. Attachment, Registration, Detachment and Deregistration procedures of user UE-A are performed in its own home network. Attachment and detachment of UE-B is performed at the visited network A and provides the ability to subsequently register the visiting user UE-B at the home network. UE_A acts as originating user and when a call is established towards user B the signalling runs from UE_A over its home network A towards the network of UE_B. Due to the previous registration of user B, network B knows that UE_B is located at network A and signalling messages are routed back to the network A and then delivered towards UE_B. The related roaming interoperability configuration is named CF_VxLTE_RMI_A; where the suffix A signifies 'visited network A'.

5.4 Configuration CF_VxLTE_RMI_B

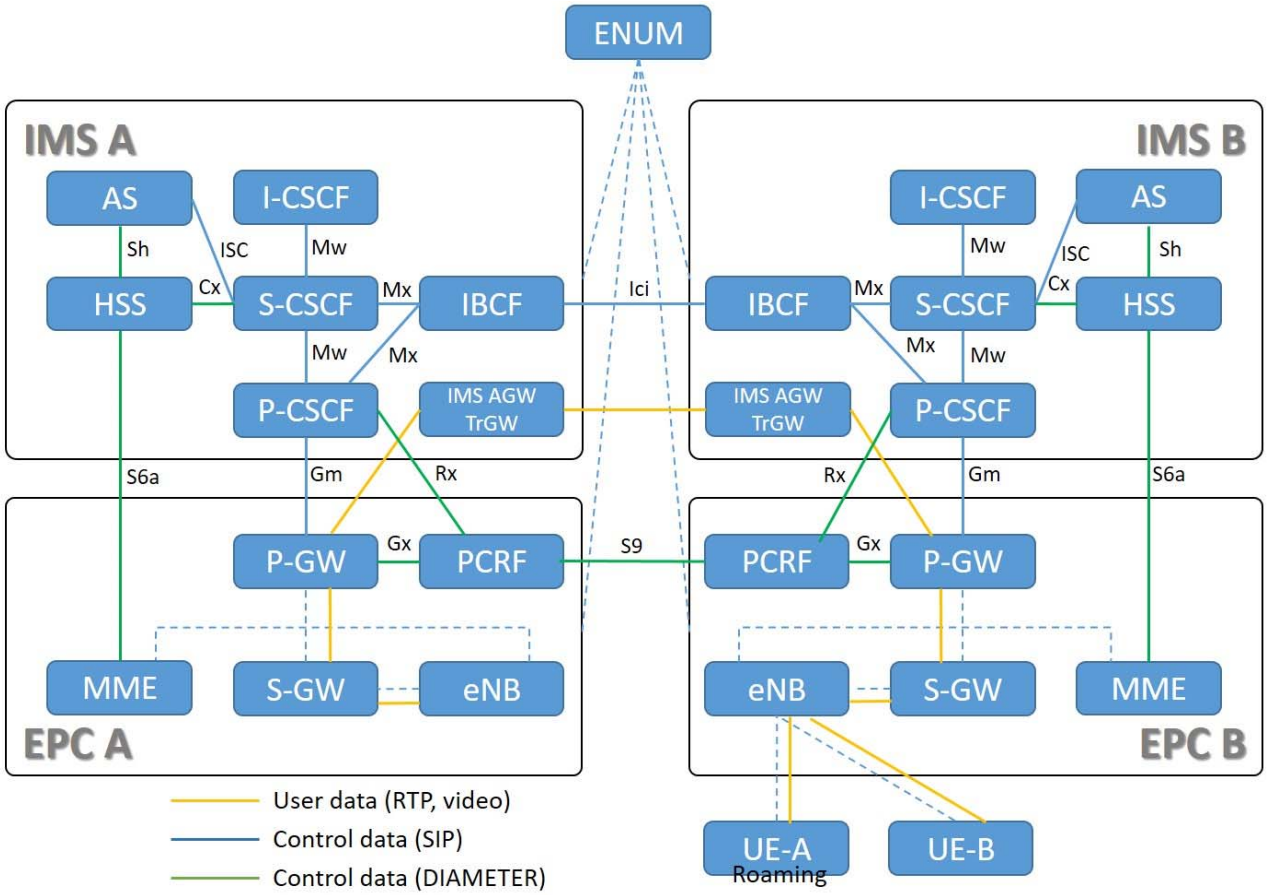

Figure 3: Configuration CF_VxLTE_RMI_B

Configuration CF_VxLTE_RMI_B describes the second roaming scenario. Within CF_VxLTE_RMI_B, UE-B connects to its home network B represented by EPC B and IMS B. UE-A connects to the visited network B attached to the EPC B. Attachment, Registration, Detachment and Deregistration procedures of user UE-B are performed in its own home network B. Attachment and detachment of UE-A is performed at the visited network B and provides the ability to subsequently register the visiting user UE-A at the home network. UE_A acts as originating user and when a call is established the signalling runs from UE_A over roaming network B towards network A. Afterwards, the call is routed back to network B towards UE_B. The related roaming interoperability configuration is named CF_VxLTE_RMI_B where the suffix B signifies 'visited network B'.

5.5 Configuration CF_VxLTE_RMI_S8HR

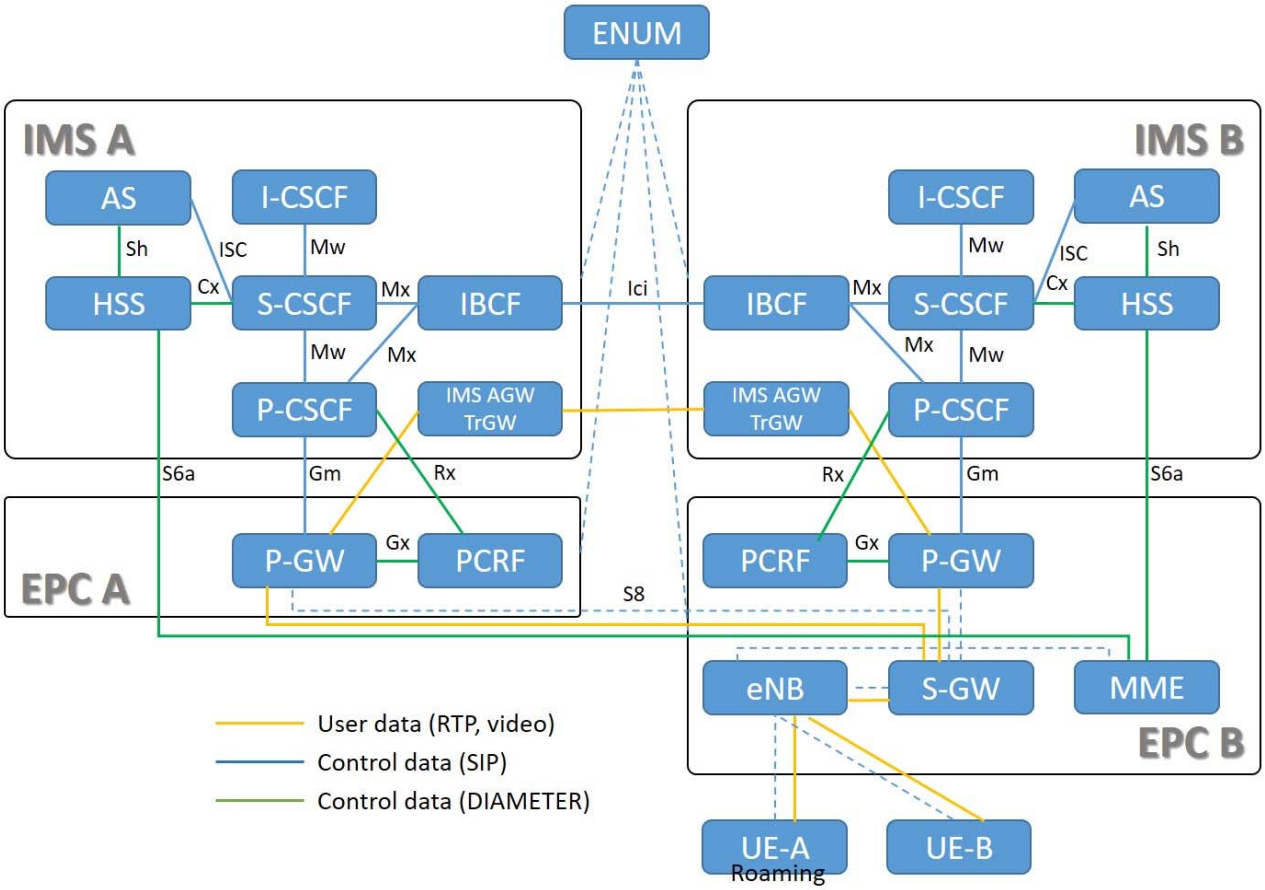

Figure 4: Configuration CF_VxLTE_RMI_S8HR

Configuration CF_VxLTE_RMI_S8HR describes an additional roaming scenario. Within CF_VxLTE_RMI_S8HR, UE-B connects to home network B represented by EPC B and IMS B. UE-A connects to visited network B attached to the EPC B. Attachment, Registration, Detachment and Deregistration procedures of user UE-B are performed in its own home network B. Attachment and detachment of UE-A is performed at the visited network A and provides the ability to subsequently register the visited user UE-A at the home network over the S8 interface. UE_A acts as originating user and when a call is established the signalling runs from UE_A over roaming/visited network B towards the network A. Afterwards, the call is routed towards UE_B. The related roaming interoperability configuration is named CF_VxLTE_RMI_S8HR where 'S8' signifies routing over interface S8.

6 Test Suite Structure

6.1 Structure for ViLTE/VoLTE test purposes

Table 1 shows the Test Suite Structure (TSS) including its subgroups defined for conformance testing of ViLTE/VoLTE test purposes.

Table 1: TSS for ViLTE/VoLTE TPs

Interfaces	Component	Scope	Category
Gm	P-CSCF	MESSAGE	Valid
		REGISTER	Valid
		INVITE	Valid
		BYE	Valid
		CANCEL	Valid
		INVITE (Busy)	Valid
		INVITE (Terminate Request)	Valid
Mw	P-CSCF I-CSCF S-CSCF	MESSAGE	Valid
		REGISTER	Valid
		INVITE	Valid
		BYE	Valid
		CANCEL	Valid
		INVITE (Busy)	Valid
		INVITE (Terminate Request)	Valid
Ic	IBCF	ACK	Valid
		REGISTER	Valid
		INVITE	Valid
		REINVITE	Valid
		BYE	Valid
		CANCEL	Valid
		INVITE (Busy)	Valid
		INVITE (Terminate Request)	Valid
		100TRY	Valid
		180RESP	Valid
		1XXRESP	Valid
		2XXRESP	Valid
		MESSAGE	Valid
Cx	HSS	UAA	Valid
		MAA	Valid
		SAA	Valid
		RTA	Valid
Rx	PCSCF PCRF	AAR	Valid
		AAA	Valid
		STR	Valid
		STA	Valid
		ASR	Valid
		ASA	Valid
Gx	PGW PCRF	RAR	Valid
		RAA	Valid
		CCR	Valid
		CCA	Valid
Sh	HSS	UDA	Valid
S6a	HSS MME	CLR	Valid
		CLA	Valid
		ULR	Valid
		ULA	Valid
		PUR	Valid
		PUA	Valid
		AIR	Valid
		AIA	Valid
S9	PCRF	CCR	Valid
		CCA	Valid
		AAR	Valid
		AAA	Valid
		STR	Valid
		STA	Valid
		ASR	Valid
		ASA	Valid
Rtp	UE		Valid

The test suite is structured as a tree with the Interfaces defined as Gm, Mw, Ic, Rx, Gx, S6a, Cx, S9, Sh. The tree is of rank 3 with the first rank a Component, the second a sub-group Scope and the third a category.

6.2 Test groups

6.2.1 Interfaces

The Interface identify the entities to be tested.

6.2.2 Component

This level contains the component where test purpose is checked.

6.2.3 Scope

This level identifies the scope of each Group.

6.2.4 Categories

This level contains the standard conformance test categories: behaviour for valid, invalid, inopportune events and timers.

7 Test Purposes (TP)

7.1 General

7.1.1 Test strategy

The test purposes were generated as a result of analysis of the base documents ETSI TS 124 229 [1], ETSI TS 129 165 [2], ETSI TS 129 228 [3], ETSI TS 129 229 [4], ETSI TS 132 260 [5], ETSI TS 132 299 [6], ETSI TS 129 214 [7], ETSI TS 129 212 [8], ETSI TS 129 272 [9], ETSI TS 129 215 [10], ETSI TS 129 328 [11], ETSI TS 129 329 [12].

NOTE: The test purposes in the present document are of three kinds:

1) TPs adopted from Release 10 where the conformance requirements are unchanged.

2) TPs adopted from Release 10 where the conformance requirements have changed (and hence the TP modified accordingly).

3) New TPs identified from the Test Description specification where new conformance requirements need to be fulfilled.

7.1.2 TP naming convention

TPs are numbered, starting at 01, within each group. Groups are organized according to the TSS.

Table 2: TP identifier naming convention scheme

Identifier: **<TP>_<interface>_<component>_<scope>_<nn>**			
<tp>	=	Test Purpose:	fixed to "TP"
<interface>	=	Interface:	GM, MW, IC, CX, RX, GX, SH, S6, RTP
<component>	=	Component:	UE, PGW, PCRF, PCSCF, SCSCF, ICSCF, IBCF, HSS, TAS
<scope>	=	group/message	INVITE, BYE…
			AAR, AAA…
<nn>	=	sequential number	(01 to 99)

7.1.3 TP structure

Each TP has been written in TDL-TO and thus in a structured manner which is consistent with all other TPs. The intention of this is to make the TPs more formal. In addition, a more readable format is provided by generating tables out of the TDL-TO format. The defined structure, that has been used, is illustrated in table 3. This table should be read in conjunction with any TP, i.e. a TP can be used as an example to facilitate the full comprehension of table 3. All structures are defined formally in the TDL Specification ETSI ES 203 119-4 [13]. The TDL-TO files are also included as an electronic annex to the present document

Table 3: Structure of a single TP

TP part	Text	Example
Header	<Identifier> <Test objective> <Reference> <PICS reference>	*see table 2* *"The IUT is responding on a correctly set …"* *ETSI TS* 124 229*#clause-3* *PIC_Server*
Initial condition (optional)	Free text description of the condition that the IUT has reached before the test purpose applies.	*… the IUT is in the initial state …*
Start point	Describes the full logic of the test purpose. Includes trigger and expected behaviour of the IUT.	*Expected behaviour* *ensure that { … }*
Trigger	One or more actions that trigger an expected response of the IUT. Mostly a set of different messages the IUT receives.	*when {* *the IUT entity receives an INVITE request message* *containing CSeq indicating value 1 …* *}*
Expected behaviour	Describes the response that the IUT sends after receiving a certain (set of) messages. This response describes the pass criteria	*then {* *the IUT entity sends a 100 Trying response message* *containing CSeq indicating value 1 …* *}*

7.2 Ic interface

TP Id	TP_IC_IBCF_GC_01
Test Objective	IMS CN components shall support SIP messages > 1 300 bytes
Reference	ETSI TS 124 229 [1], clause 4.2A
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isAttachedTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends a MESSAGE
containing Message_Body_Size indicating value greater than 1 300 bytes
to the IMS_A entity
}
then {
the IMS_IBCF_A forwards the MESSAGE to the IMS_IBCF_B entity
}
}	

TP Id	TP_IC_IBCF_INVITE_01
Test Objective	S-CSCF shall insert orig-ioi parameter, remove access-network-charging-info parameter and P-Access-Network-Info header before sending initial INVITE or an initial request over NNI
Reference	ETSI TS 124 229 [1], clauses 5.4.3.2 paragraph 11 (1st numbered list) and 5.10.3.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the IMS_A isNotConfiguredForTopologyHiding
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends an initial INVITE "addressed to UE_B" to the IMS_A entity
}
then {
the IMS_IBCF_A forwards the initial INVITE containing
Route not indicating value PX_S_CSCF_A_SIP_URI,
PChargingVector containing
Icid_value,
Orig_Ioi indicating value PX_IMS_A_ICID,
not Access_Network_Charging_Info,
not Term_Ioi,
RecordRoute containing
Header indicating value PX_S_CSCF_A_SIP_URI,
not PAccessNetworkInfo
to the IMS_IBCF_B entity
}
}	

TP Id	TP_IC_IBCF_INVITE_02
Test Objective	S-CSCF inserts a second P-Asserted-Identity header indicating a registered tel URI or sip URI whichever is not present in initial INVITE
Reference	ETSI TS 124 229 [1], clause 5.4.3.2 paragraph 9 (item 9 1st numbered list)
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A registeredIdentityTelURI and
the UE_A registeredIdentitySipURI
}	

Expected Behaviour

ensure that {
when {
the UE_A sends an initial INVITE "addressed to UE_B" to the IMS_A entity
}
then {
the IMS_IBCF_A forwards the initial INVITE containing
PAssertedID containing
PAssertedIDValue indicating value PX_UE_A_SIP_URI,
PAssertedIDValue indicating value PX_UE_A_TEL_URI
to the IMS_IBCF_B entity
}
}

TP Id	TP_IC_IBCF_INVITE_03
Test Objective	S-CSCF uses ENUM/DNS to translate Tel URIs to SIP URIs in initial INVITE requests
Reference	ETSI TS 124 229 [1], clause 5.4.3.2 (item 10 1st numbered list)
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the NW_UE_B and
the Enum_DB isConfiguredWithENUMentryForTelURI_E164NumberOf the UE_B
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends an initial INVITE "addressed to UE_B" containing
RequestLine indicating value PX_UE_B_TEL_URI
 	
to the IMS_S_CSCF_A and
the IMS_S_CSCF_A sends a NAPTR_Query containing
Query indicating value PX_UE_B_TEL_URI
to the Enum_DB and
the Enum_DB sends a NAPTR_Response containing
NAPTR_ResourceRecord indicating value PX_UE_B_SIP_URI
to the IMS_S_CSCF_A entity
}
then {
the IMS_IBCF_A forwards the initial INVITE containing
RequestLine indicating value PX_UE_B_SIP_URI,
PChargingVector containing
not Access_Network_Charging_Info
to the IMS_IBCF_B entity
}
}	

TP Id	TP_IC_IBCF_INVITE_04
Test Objective	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 and the UE is not performing the functions of an external attached network using static mode of operation
Reference	ETSI TS 124 229 [1], clause 5.2.6.3.3 (1st numbered list)
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the IMS_A isNotConfiguredForTopologyHiding and
the UE_B isAttachedTo the EPC_A
}	

Expected Behaviour

ensure that {
  when {
  the UE_B sends an initial INVITE "addressed to UE_A" to the IMS_A entity
  }
  then {
  the IMS_IBCF_A forwards the initial INVITE containing
  Route containing
  RouteBody not indicating value PX_P_CSCF_A_SIP_URI,
  RouteBody indicating value PX_P_CSCF_Service_Route_URIs ,
  Via containing
  ViaBody containing
  HostPort indicating value PX_P_CSCF_Port_Number ,
  PX_P_CSCF_FQDN "or"
  PX_P_CSCF_IP_Addr ,
  RecordRoute containing
  RouteBody containing
  NameAddr indicating value PX_P_CSCF_Port_Number_Subsequent_Requests ,
  PX_P_CSCF_FQDN_address_IMS_A "or"
  PX_P_CSCF_IP_address_IMS_A ,
  not PPreferredID ,
  PAssertedID indicating value PX_UE_B_SIP_URI ,
  PChargingVector indicating value PX_IMS_A_ICID
  to the IMS_IBCF_B entity
  }
}

TP Id	TP_IC_IBCF_INVITE_05
Test Objective	Verify that the IBCF successfully processes an initial INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clause 5.2.6.3.3 (1st numbered list)
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A
  }	

Expected Behaviour	

ensure that {
  when {
  the UE_A sends an initial INVITE "addressed to roaming UE_B" to the IMS_A entity
  }
  then {
  the IMS_IBCF_A receives the initial INVITE
  from the IMS_IBCF_B and
  the IMS_IBCF_A forwards the initial INVITE
  to the IMS_P_CSCF_A entity
  }
}	

TP Id	TP_IC_IBCF_180RESP_01
Test Objective	S-CSCF include term-ioi parameter and restores orig-ioi in 180 responses from UE to initial requests in terminating network
Reference	ETSI TS 124 229 [1], clause 5.4.3.3 (item 2 in 3rd numbered list)
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A hasReceivedInitialRequestForDialog from the UE_B entity
  }	

Expected Behaviour

ensure that {
when {
the UE_A sends a 180_Ringing response "addressed to UE_B" to the IMS_A entity
}
then {
the IMS_IBCF_A sends the 180_Ringing response containing
P_Charging_Vector_Header containing
Orig_Ioi indicating value PX_IMS_B_ICID ,
Term_Ioi indicating value PX_IMS_A_ICID
to the IMS_IBCF_B entity
}
}

TP Id	TP_IC_IBCF_180RESP_02
Test Objective	I-CSCF shall remove P-Charging-Function-Addresses header from 180 response to initial request
Reference	ETSI TS 124 229 [1], clause 5.3.2.1 (paragraph after note 10)
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A hasReceivedInitialRequestForDialog from the UE_B entity
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends a 180_Ringing response "addressed to UE_B" to the IMS_A entity
}
then {
the IMS_IBCF_A sends the 180_Ringing response containing
not PChargingVector
to the IMS_IBCF_B entity
}
}	

TP Id	TP_IC_IBCF_183RESP_01
Test Objective	S-CSCF inserts a second P-Asserted-Identity header in 183 response indicating a registered tel URI or SIP URI whichever is not present
Reference	ETSI TS 124 229 [1], clause 5.4.3.3 (item 3 in 3rd numbered list)
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A registeredPublicIdsWithTelUriAndSipUri and
the UE_A hasReceivedInitialRequestForDialog from the UE_B entity
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends a 183_Session Progress response "addressed to UE_B" to the IMS_A entity
}
then {
the IMS_IBCF_A sends the 183 Session Progress response containing
PAssertedID containing
PAssertedIDValue indicating value PX_UE_A_SIP_URI
to the IMS_IBCF_B entity
}
}	

TP Id	TP_IC_IBCF_1XXRESP_01
Test Objective	S-CSCF inserts a second P-Asserted-Identity header in 1xx response indicating a registered tel URI or SIP URI whichever is not present
Reference	ETSI TS 124 229 [1], clause 5.4.3.3 (item 3 in 3rd numbered list)
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A registeredPublicIdsWithTelUriAndSipUri and
the UE_A hasReceivedInitialRequestForDialog from the UE_B entity
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends a 180_Ringing response "addressed to UE_B" to the IMS_A entity
}
then {
the IMS_IBCF_A sends the 180_Ringing response containing
PAssertedID containing
PAssertedIDValue indicating value PX_UE_A_SIP_URI
to the IMS_IBCF_B entity
}
}	

TP Id	TP_IC_IBCF_1XXRESP_02
Test Objective	The P-CSCF receives a 180 response to an initial request for a dialog from the UE
Reference	ETSI TS 124 229 [1], clause 5.2.6.4.4 (1st numbered list)
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A hasReceivedInitialRequestForDialog from the UE_B entity
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends a 180_Ringing response "addressed to UE_B" to the IMS_A entity
}
then {
the IMS_IBCF_A sends the 180_Ringing response containing
RecordRoute containing
RouteBody containing
NameAddr indicating value PX_P_CSCF_A_SIP_URI ,
RouteBody containing
NameAddr indicating value PX_P_CSCF_Port_Number_Subsequent_Requests ,
not CompSipUri ,
not PPreferredID ,
PAssertedID containing
PAssertedIDValue indicating value PX_UE_A_SIP_URI
to the IMS_IBCF_B entity
}
}	

TP Id	TP_IC_IBCF_1XXRESP_03
Test Objective	The P-CSCF receives a 180 response to an initial request for a dialog from the UE (Originating leg)
Reference	ETSI TS 124 229 [1], clause 5.2.6.4.4 (1st numbered list)
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_B hasReceivedInitialRequestForDialog from the UE_A entity
}	

Expected Behaviour

ensure that {
when {
the UE_B sends a 180_Ringing response "addressed to UE_A" to the IMS_B entity
}
then {
the IMS_IBCF_B receives the 180_Ringing response containing
RecordRoute containing
RouteBody containing
NameAddr indicating value PX_P_CSCF_A_SIP_URI ,
RouteBody containing
NameAddr indicating value PX_P_CSCF_Port_Number_Subsequent_Requests ,
not CompSipUri ,
not PPreferredID ,
PAssertedID containing
PAssertedIDValue indicating value PX_UE_A_SIP_URI
from the IMS_IBCF_A and
the IMS_IBCF_B sends the 180_Ringing
to the IMS_P_CSCF_B entity
}
}

TP Id	TP_IC_IBCF_1XXRESP_04
Test Objective	The P-CSCF receives a 180 response to an initial request for a dialog from the UE (Terminating leg)
Reference	ETSI TS 124 229 [1], clause 5.2.6.4.4 (1st numbered list)
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A and
the UE_B hasReceivedInitialRequestForDialog from the UE_A entity
}	

Expected Behaviour	

ensure that {
when {
the UE_B sends a 180_Ringing response "addressed to UE_A" to the IMS_A entity
}
then {
the IMS_IBCF_A sends the 180_Ringing response containing
RecordRoute containing
RouteBody containing
NameAddr indicating value PX_P_CSCF_A_SIP_URI ,
RouteBody containing
NameAddr indicating value PX_P_CSCF_Port_Number_Subsequent_Requests ,
not CompSipUri ,
not PPreferredID ,
PAssertedID containing
PAssertedIDValue indicating value PX_UE_A_SIP_URI
to the IMS_IBCF_B entity
}
}	

TP Id	TP_IC_IBCF_2XXRESP_01
Test Objective	S-CSCF include term-ioi parameter and restores orig-ioi in 2xx responses from UE to initial requests in terminating network
Reference	ETSI TS 124 229 [1], clause 5.4.3.3 (item 2 in 3rd numbered list)
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_B hasReceived180OnInitialRequest from the UE_A entity
}	

Expected Behaviour

ensure that {
when {
the UE_A sends a 200_Ok response "addressed to UE_B" to the IMS_A entity
}
then {
the IMS_IBCF_A sends the 200_Ok response containing
PChargingVector containing
Orig_Ioi indicating value PX_IMS_B_ICID ,
Term_Ioi indicating value PX_IMS_A_ICID
to the IMS_IBCF_B entity
}
}

TP Id	TP_IC_IBCF_2XXRESP_02
Test Objective	S-CSCF inserts a second P-Asserted-Identity header in 1xx response indicating a registered tel URI or SIP URI whichever is not present
Reference	ETSI TS 124 229 [1], clause 5.4.3.3 (item 3 in 3rd numbered list)
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A registeredPublicIdsWithTelUriAndSipUri and
the UE_B hasReceived180OnInitialRequest from the UE_A entity
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends a 200_Ok response "addressed to UE_B" to the IMS_A entity
}
then {
the IMS_IBCF_A sends the 200_Ok response containing
PAssertedID containing
PAssertedIDValue indicating value PX_UE_A_SIP_URI ,
PAssertedIDValue indicating value PX_UE_A_TEL_URI
to the IMS_IBCF_B entity
}
}	

TP Id	TP_IC_IBCF_2XXRESP_03
Test Objective	I-CSCF shall remove P-Charging-Function-Addresses header from 200 response to initial request
Reference	ETSI TS 124 229 [1], clause 5.3.2.1 (paragraph after note 10)
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A hasReceivedInitialRequestForDialog from the UE_B entity
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends a 200_Ok response "addressed to UE_B" to the IMS_A entity
}
then {
the IMS_IBCF_A sends the 200_Ok response containing
not PChargingFunctionAddresses
to the IMS_IBCF_B entity
}
}	

TP Id	TP_IC_IBCF_2XXRESP_04
Test Objective	S-CSCF remove access-network-charging-info parameter from 2xx response to subsequent or target refresh requests
Reference	ETSI TS 124 229 [1], clause 5.4.3.3 (9th numbered list)
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A hasReceivedSubsequentOrTargetRefreshRequestInDialog
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends a 200_Ok response "addressed to UE_B" to the IMS_A entity
}
then {
the IMS_IBCF_A sends the 200_Ok response containing
PChargingVector containing
not AccessNetworkChargingInfo
to the IMS_IBCF_B entity
}
}	

TP Id	TP_IC_IBCF_2XXRESP_05
Test Objective	The P-CSCF receives a 2xx response to an initial request for a dialog from the UE (Originating leg)
Reference	ETSI TS 124 229 [1], clause 5.2.6.4.4 (1st numbered list)
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_B hasReceivedInitialRequestForDialog from the UE_A entity
}	

Expected Behaviour	

ensure that {
when {
the UE_B sends a 200_Ok response "addressed to UE_A" to the IMS_B entity
}
then {
the IMS_IBCF_B receives a 200_Ok response containing
RecordRoute containing
RouteBody containing
NameAddr indicating value PX_P_CSCF_A_SIP_URI ,
RouteBody containing
NameAddr indicating value PX_P_CSCF_Port_Number_Subsequent_Requests ,
not CompSipUri ,
not PPreferredID ,
PAssertedID containing
PAssertedIDValue indicating value PX_UE_B_SIP_URI
from the IMS_IBCF_A and
the IMS_IBCF_B sends the 200_Ok response
to the IMS_P_CSCF_B entity
}
}	

TP Id	TP_IC_IBCF_2XXRESP_06
Test Objective	The IBCF forwards a 2xx response to a successful initial request for a dialog from the UE A (Terminating leg)
Reference	ETSI TS 124 229 [1], clause 5.2.6.4.4 (1st numbered list)
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A and
the UE_B hasReceivedInitialRequestForDialog from the UE_A entity
}	

Expected Behaviour

ensure that {
when {
the UE_B sends a 200_Ok response "addressed to UE_A" to the IMS_A entity
}
then {
the IMS_IBCF_A sends the 200_Ok response containing
RecordRoute containing
RouteBody containing
NameAddr indicating value PX_P_CSCF_A_SIP_URI ,
RouteBody containing
NameAddr indicating value PX_P_CSCF_Port_Number_Subsequent_Requests ,
not CompSipUri ,
not PPreferredID ,
PAssertedID containing
PAssertedIDValue indicating value PX_UE_B_SIP_URI
to the IMS_IBCF_A and
the IMS_IBCF_B sends the 200_Ok response
to the IMS_P_CSCF_B // MORE TO COME!!!!
}
}

TP Id	TP_IC_IBCF_REINVITE_01
Test Objective	S-CSCF shall handle subsequent INVITE prior to sending it over NNI
Reference	ETSI TS 124 229 [1], clause 5.4.3.2 (6th numbered list)
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A hasInitiatedDialogWith the UE_B
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends a subsequent INVITE "addressed to UE_B" to the IMS_A entity
}
then {
the IMS_IBCF_A sends the subsequent INVITE containing
RecordRoute indicating value PX_S_CSCF_A_SIP_URI ,
Route not indicating value PX_S_CSCF_A_SIP_URI
PChargingVector containing
not AccessNetworkChargingInfo
to the IMS_IBCF_B entity
}
}	

TP Id	TP_IC_IBCF_BYE_01
Test Objective	S-CSCF removes its own SIP URI from the route header before sending BYE
Reference	ETSI TS 124 229 [1], clause 5.4.3.2 (item 1 in 7th numbered list)
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A hasInitiatedDialogWith the UE_B
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends a BYE "addressed to UE_B" to the IMS_A entity
}
then {
the IMS_IBCF_A forwards the BYE containing
Route not indicating value PX_S_CSCF_A_SIP_URI
to the IMS_IBCF_B entity
}
}	

TP Id	TP_IC_IBCF_BYE_02
Test Objective	IBCF successfully processes a BYE message
Reference	ETSI TS 124 229 [1], clause 5.4.3.2 (item 1 in 7th numbered list)
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_A hasInitiatedDialogWith the UE_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_IBCF_B receives a BYE "addressed to UE_A"
from the IMS_A entity
}
then {
the IMS_IBCF_B forwards the BYE
to the IMS_P_CSCF_B and
the IMS_IBCF_B receives a 200_OK
from the IMS_P_CSCF_B and
the IMS_IBCF_B sends the 200_OK
to the IMS_A entity
}
}	

TP Id	TP_IC_IBCF_BYE_03
Test Objective	IBCF successfully processes a BYE message
Reference	ETSI TS 124 229 [1], clause 5.4.3.2 (item 1 in 7th numbered list)
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_A hasInitiatedDialogWith the UE_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_IBCF_B receives a BYE "addressed to UE_B"
from the IMS_P_CSCF_B entity
}
then {
the IMS_IBCF_B forwards the BYE
to the IMS_A and
the IMS_IBCF_B receives a 200_OK
from the IMS_A and
the IMS_IBCF_B sends the 200_OK
to the IMS_P_CSCF_B entity
}
}	

TP Id	TP_IC_IBCF_ACK_01
Test Objective	S-CSCF removes its own SIP URI from the route header before sending ACK
Reference	ETSI TS 124 229 [1], clause 5.4.3.2 (item 1 in 7th numbered list)
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the IMS_A hasReceived200OkOnInitialRequestForDialogWith the UE_B
}	

Expected Behaviour

ensure that {
when {
the UE_A sends an ACK "addressed to UE_B" to the IMS_A entity
}
then {
the IMS_IBCF_A forwards the ACK containing
Route not indicating value PX_S_CSCF_A_SIP_URI
to the IMS_IBCF_B entity
}
}

TP Id	TP_IC_IBCF_100TRY_01
Test Objective	The IBCF shall respond with a 100 (Trying) provisional response on initial INVITE (terminating leg)
Reference	ETSI TS 124 229 [1], clause 5.10.3.2
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A and
the UE_B isAttachedTo the EPC_A
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends an initial INVITE "addressed to UE_B" to the IMS_A entity
}
then {
the IMS_IBCF_A receives the INVITE
from the IMS_IBCF_B and
the IMS_IBCF_A sends a 100_Trying response
to the IMS_IBCF_B entity
}
}	

TP Id	TP_IC_IBCF_100TRY_02
Test Objective	The IBCF shall respond with a 100 (Trying) provisional response on initial INVITE (originating leg)
Reference	ETSI TS 124 229 [1], clause 5.10.3.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_A isAttachedTo the EPC_B
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends an initial INVITE "addressed to UE_B" to the IMS_B entity
}
then {
the IMS_IBCF_B sends the INVITE
to the IMS_IBCF_A and
the IMS_IBCF_B receives a 100_Trying response
from the IMS_IBCF_A entity
}
}	

TP Id	TP_IC_IBCF_CANCEL_01
Test Objective	S-CSCF removes its own SIP URI from the route header before sending CANCEL (Originating leg)
Reference	ETSI TS 124 229 [1], clause 5.4.3.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A hasReceived180OnInitialRequest from the UE_B entity
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends a CANCEL "addressed to UE_B" to the IMS_A entity
}
then {
the IMS_IBCF_A sends a CANCEL containing
Route not indicating value PX_S_CSCF_A_SIP_URI
to the IMS_IBCF_B and
the IMS_IBCF_B forwards the CANCEL
to the IMS_P_CSCF_B entity
}
}	

TP Id	TP_IC_IBCF_CANCEL_02
Test Objective	S-CSCF removes its own SIP URI from the route header before sending CANCEL (Terminating leg)
Reference	ETSI TS 124 229 [1], clause 5.4.3.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A isRequestedToSend a CANCEL to the UE_B entity
}	

Expected Behaviour	

ensure that {
when {
the IMS_IBCF_B receives the CANCEL containing
Route not indicating value PX_S_CSCF_A_SIP_URI
from the IMS_A entity
}
then {
the IMS_IBCF_B forwards the CANCEL
to the IMS_S_CSCF_B entity
}
}	

TP Id	TP_IC_IBCF_CANCEL_03
Test Objective	S-CSCF removes its own SIP URI from the route header before sending CANCEL (Originating leg)
Reference	ETSI TS 124 229 [1], clause 5.4.3.2
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_A hasReceived180OnInitialRequest from the UE_B entity
}	

Expected Behaviour

ensure that {
when {
the UE_A sends a CANCEL "addressed to UE_B" to the IMS_B entity
}
then {
the IMS_IBCF_B sends a CANCEL containing
Route not indicating value PX_S_CSCF_B_SIP_URI
to the IMS_IBCF_A entity
}
}

TP Id	TP_IC_IBCF_CANCEL_OK_01
Test Objective	The P-CSCF receives a 200 OK response to a CANCEL request from the UE receiving the CANCEL request (Originating leg)
Reference	ETSI TS 124 229 [1], clause 5.2.8.1.1 and IETF RFC 3261 [14], clause 9.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A hasReceivedInitialRequestForDialog from the UE_B and
the UE_A isRequestedToSend a CANCEL
}	

Expected Behaviour	

ensure that {
when {
the UE_B sends a 200_Ok response "addressed to UE_A" to the IMS_A entity
}
then {
the IMS_IBCF_A receives the 200_Ok response
and
the IMS_IBCF_A forwards the 200_OK
to the IMS_P_CSCF_A entity
}
}	

TP Id	TP_IC_IBCF_CANCEL_OK_02
Test Objective	The P-CSCF receives a 200 OK response to a CANCEL request from the UE receiving the CANCEL request (Terminating leg)
Reference	ETSI TS 124 229 [1], clause 5.2.8.1.1 and IETF RFC 3261 [14], clause 9.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A hasReceivedInitialRequestForDialog from the UE_B and
the UE_A isRequestedToSend a CANCEL
}	

Expected Behaviour	

ensure that {
when {
the UE_B sends a 200_Ok response "addressed to UE_A" to the IMS_A entity
}
then {
the IMS_IBCF_B sends the 200_Ok
to the IMS_A entity
}
}	

TP Id	TP_IC_IBCF_CANCEL_OK_03
Test Objective	The P-CSCF receives a 200 OK response to a CANCEL request from the UE receiving the CANCEL request (Originating leg)
Reference	ETSI TS 124 229 [1], clause 5.2.8.1.1 and IETF RFC 3261 [14], clause 9.2
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_A hasReceivedInitialRequestForDialog from the UE_B and
the UE_A isRequestedToSend a CANCEL
}	

Expected Behaviour	

ensure that {
when {
the UE_B sends a 200_Ok response "addressed to UE_A" to the IMS_A entity
}
then {
the IMS_IBCF_A receives the 200_Ok response
and
the IMS_IBCF_A forwards the 200_OK
to the IMS_P_CSCF_A entity
}
}	

TP Id	TP_IC_IBCF_487INVITE_01
Test Objective	Verify that the IBCF successfully processes a 487 INVITE (Request Terminated). (Originating leg)
Reference	ETSI TS 124 229 [1], clause 5.3.2.2 and IETF RFC 3261 [14], clause 9.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A hasReceivedInitialRequestForDialog from the UE_B and
the UE_A isRequestedToSend a CANCEL and
the UE_A hasReceived200OkCancel from the UE_B entity
}	

Expected Behaviour	

ensure that {
when {
the UE_B sends a 487_INVITE request "addressed to UE_A" to the IMS_A entity
}
then {
the IMS_IBCF_A receives the 487_INVITE request
from the IMS_B and
the IMS_IBCF_A forwards the 487_INVITE request
to the IMS_S_CSCF_A entity
}
}	

TP Id	TP_IC_IBCF_487INVITE_02
Test Objective	Verify that the IBCF successfully processes a 487 INVITE (Request Terminated). (Terminating leg)
Reference	ETSI TS 124 229 [1], clause 5.3.2.2 and IETF RFC 3261 [14], clause 9.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A hasReceivedInitialRequestForDialog from the UE_B and
the UE_A isRequestedToSend a CANCEL and
the UE_A hasReceived200OkCancel from the UE_B entity
}	

Expected Behaviour

ensure that {
when {
the UE_B sends a 487_INVITE request "addressed to UE_A" to the IMS_B entity
}
then {
the IMS_IBCF_B sends the 487_INVITE request
to the IMS_IBCF_A entity
}
}

TP Id	TP_IC_IBCF_487INVITE_ACK_01
Test Objective	Verify that the IBCF successfully processes an ACK response for a Request terminated. (Originating leg)
Reference	ETSI TS 124 229 [1], clause 5.3.2.2 and IETF RFC 3261 [14], clause 9.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A hasReceivedInitialRequestForDialog from the UE_B and
the UE_A isRequestedToSend a CANCEL and
the UE_A hasReceived200OkCancel from the UE_B and
the UE_A hasReceivedTerminatedRequest from the UE_B entity
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends a ACK response "addressed to UE_A" to the IMS_A entity
}
then {
the IMS_IBCF_A receives the ACK response
from the IMS_S_CSCF_A and
the IMS_IBCF_A sends the ACK response
to the IMS_IBCF_B entity
}
}	

TP Id	TP_IC_IBCF_487INVITE_ACK_02
Test Objective	Verify that the IBCF successfully processes an ACK response for a Request terminated. (Terminating leg)
Reference	ETSI TS 124 229 [1], clause 5.3.2.2 and IETF RFC 3261 [14], clause 9.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A hasReceivedInitialRequestForDialog from the UE_B and
the UE_A isRequestedToSend a CANCEL and
the UE_A hasReceived200OkCancel from the UE_B and
the UE_A hasReceivedTerminatedRequest from the UE_B entity
}	

Expected Behaviour	

ensure that {
when {
the IMS_A sends a ACK response "addressed to UE_A" to the IMS_B entity
}
then {
the IMS_IBCF_B receives the ACK response
from the IMS_A and
the IMS_IBCF_B forwards the ACK response
to the IMS_S_CSCF_B entity
}
}	

TP Id	TP_IC_IBCF_486INVITE_01
Test Objective	Verify that the IBCF successfully processes a 486 INVITE (BUSY) originating leg
Reference	ETSI TS 124 229 [1], clause 5.10.3.2 and IETF RFC 3261 [14], clause 13.3.1.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
UE_A isAttachedTo the EPC_A and
UE_B isAttachedTo the EPC_B and
UE_A isRegisteredTo the IMS_A and
UE_B isRegisteredTo the IMS_B and
UE_B isBusy
}	

Expected Behaviour	

ensure that {
when {
the UE_B sends a 486_INVITE "addressed to UE_A" to the IMS_A entity
}
then {
the IMS_IBCF_A receives the 486_INVITE
from the IMS_B and
the IMS_IBCF_A forwards the 486_INVITE
to the IMS_P_CSCF_A entity
}
}	

TP Id	TP_IC_IBCF_486INVITE_02
Test Objective	Verify that the IBCF successfully processes a 486 INVITE (BUSY) Terminating leg
Reference	ETSI TS 124 229 [1], clause 5.10.3.2 and IETF RFC 3261 [14], clause 13.3.1.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
UE_A isAttachedTo the EPC_A and
UE_B isAttachedTo the EPC_B and
UE_A isRegisteredTo the IMS_A and
UE_B isRegisteredTo the IMS_B and
UE_B isBusy
}	

Expected Behaviour	

ensure that {
when {
the UE_B sends a 486_INVITE "addressed to UE_A" to the IMS_B entity
}
then {
the IMS_IBCF_B receives the 486_INVITE
from the IMS_S_CSCF_B and
the IMS_IBCF_B forwards the 486_INVITE
to the IMS_A entity
}
}	

TP Id	TP_IC_IBCF_486INVITE_03
Test Objective	Verify that the IBCF successfully processes a 486 INVITE (BUSY) originating leg, roaming case
Reference	ETSI TS 124 229 [1], clause 5.10.3.2 and IETF RFC 3261 [14], clause 13.3.1.3
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
UE_A isAttachedTo the EPC_B and
UE_B isAttachedTo the EPC_B and
UE_A isRegisteredTo the IMS_B and
UE_B isRegisteredTo the IMS_B and
UE_B isBusy
}	

Expected Behaviour

ensure that {
when {
the UE_B sends a 486_INVITE "addressed to UE_A" to the IMS_A entity
}
then {
the IMS_IBCF_B receives the 486_INVITE
from the IMS_A and
the IMS_IBCF_B forwards the 486_INVITE
to the IMS_P_CSCF_B entity
}
}

TP Id	TP_IC_IBCF_486INVITE_04
Test Objective	Verify that the IBCF successfully processes a 486 INVITE (BUSY) terminating leg, roaming case
Reference	ETSI TS 124 229 [1], clause 5.10.3.2 and IETF RFC 3261 [14], clause 13.3.1.3
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

with {
UE_A isAttachedTo the EPC_A and
UE_B isAttachedTo the EPC_A and
UE_A isRegisteredTo the IMS_A and
UE_B isRegisteredTo the IMS_A and
UE_B isBusy
}	

Expected Behaviour	

ensure that {
when {
the UE_B sends a 486_INVITE "addressed to UE_A" to the IMS_A entity
}
then {
the IMS_IBCF_A receives the 486_INVITE
from the IMS_P_CSCF_A and
the IMS_IBCF_A sends the 486_INVITE
to the IMS_IBCF_B entity
}
}	

TP Id	TP_IC_IBCF_486INVITE_ACK_01
Test Objective	Verify that the IBCF successfully processes an ACK in response to a BUSY reply during session set-up (Originating leg)
Reference	ETSI TS 124 229 [1], clause 5.10.3.2 and IETF RFC 3261 [14], clause 13.3.1.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
UE_A isAttachedTo the EPC_A and
UE_B isAttachedTo the EPC_B and
UE_A isRegisteredTo the IMS_A and
UE_B isRegisteredTo the IMS_B and
UE_B isBusy and
UE_B hasResponded486INVITE
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends an ACK "addressed to UE_B" to the IMS_B entity
}
then {
the IMS_IBCF_A receives the ACK
from the IMS_P_CSCF_A and
the IMS_IBCF_A sends the ACK
to the IMS_IBCF_B entity
}
}	

TP Id	TP_IC_IBCF_486INVITE_ACK_02
Test Objective	Verify that the IBCF successfully processes an ACK in response to a BUSY reply during session set-up (Terminating leg)
Reference	ETSI TS 124 229 [1], clause 5.10.3.2 and IETF RFC 3261 [14], clause 13.3.1.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
UE_A isAttachedTo the EPC_A and
UE_B isAttachedTo the EPC_B and
UE_A isRegisteredTo the IMS_A and
UE_B isRegisteredTo the IMS_B and
UE_B isBusy and
UE_B hasResponded486INVITE
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends an ACK "addressed to UE_B" to the IMS_A entity
}
then {
the IMS_IBCF_B receives the ACK
from the IMS_A and
the IMS_IBCF_B forwards the ACK
to the IMS_S_CSCF_B entity
}
}	

TP Id	TP_IC_IBCF_REGISTER_01
Test Objective	The IBCF shall perform encryption for topology hiding before an initial REGISTER request is sent
Reference	ETSI TS 124 229 [1], clauses 5.10.2.1, 5.10.3.1 and 5.10.4.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
IMS_A isConfiguredForTopologyHiding and
the UE_A isAttachedTo the EPC_B and
the UE_A isNotRegisteredTo the IMS_B and
the UE_B isNotRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends a REGISTER "addressed to home network IMS_A" to the IMS_B entity
}
then {
the IMS_IBCF_B sends the REGISTER containing
Via containing
ViaBody containing
HostPort indicating value PX_IBCF_B_SIP_URI ,
Route indicating value PX_IBCF_B_SIP_URI,
Path containing
PathValue indicating value PX_IBCF_B_SIP_URI
to the IMS_IBCF_A and
the IMS_IBCF_B receives the 401_Unauthorized
from the IMS_A and
the IMS_IBCF_B forwards the 401_Unauthorized
to the IMS_P_CSCF_B entity
}
}	

TP Id	TP_IC_IBCF_REGISTER_02
Test Objective	The IBCF shall perform encryption for topology hiding before a second REGISTER request is sent
Reference	ETSI TS 124 229 [1], clauses 5.10.2.1, 5.10.3.1 and 5.10.4.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
IMS_A isConfiguredForTopologyHiding and
the UE_A isAttachedTo the EPC_B and
the UE_A isNotRegisteredTo the IMS_B and
the UE_B isNotRegisteredTo the IMS_B and
the UE_A hasAchievedFirstREGISTER
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends a second REGISTER "addressed to home network IMS_A" to the IMS_B entity
}
then {
the IMS_IBCF_B sends the REGISTER containing
Via containing
ViaBody containing
HostPort indicating value PX_IBCF_B_SIP_URI ,
Route indicating value PX_IBCF_B_SIP_URI,
Path containing
PathValue indicating value PX_IBCF_B_SIP_URI
to the IMS_IBCF_A and
the IMS_IBCF_B receives the 200_OK
from the IMS_A and
the IMS_IBCF_B forwards the 200_OK
to the IMS_P_CSCF_B entity
}
}	

TP Id	TP_IC_IBCF_REGISTER_03
Test Objective	Verify that the IBCF successfully processes a user de-registration
Reference	ETSI TS 124 229 [1], clauses 5.10.2.1, 5.10.3.1 and 5.10.4.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends a REGISTER "addressed to home network IMS_A" containing
Expire indicating value 0
to the IMS_B entity
}
then {
the IMS_IBCF_B receives the REGISTER
from the IMS_P_CSCF_B and
the IMS_IBCF_B forwards the REGISTER
to the IMS_A and
the IMS_IBCF_B receives a 200_OK
from the IMS_A and
the IMS_IBCF_B forwards the 200_OK
to the IMS_P_CSCF_B entity
}
}	

TP Id	TP_IC_IBCF_REGISTER_04
Test Objective	Verify that the IBCF successfully processes an IMS de-registration due to expiration of registration timer
Reference	ETSI TS 124 229 [1], clauses 5.10.2.1, 5.10.3.1 and 5.10.4.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_B sends a REGISTER "addressed to home network IMS_A" containing
Expire indicating value 0
to the IMS_B entity
}
then {
the IMS_IBCF_B receives the REGISTER
from the IMS_P_CSCF_B and
the IMS_IBCF_B forwards the REGISTER
to the IMS_A and
the IMS_IBCF_B receives a 200_OK
from the IMS_A and
the IMS_IBCF_B forwards the 200_OK
to the IMS_P_CSCF_B entity
}
}	

TP Id	TP_IC_IBCF_REGISTER_05
Test Objective	Verify that the IBCF successfully processes an IMS de-registration due user initiated network detachment
Reference	ETSI TS 124 229 [1], clauses 5.10.2.1, 5.10.3.1 and 5.10.4.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_B sends a REGISTER "addressed to home network IMS_A" containing
Expire indicating value 0
to the IMS_B entity
}
then {
the IMS_IBCF_B receives the REGISTER
from the IMS_P_CSCF_B and
the IMS_IBCF_B forwards the REGISTER
to the IMS_A and
the IMS_IBCF_B receives a 200_OK
from the IMS_A and
the IMS_IBCF_B forwards the 200_OK
to the IMS_P_CSCF_B entity
}
}	

TP Id	TP_IC_IBCF_SUBSCRIBE_01
Test Objective	Verify that the IBCF successfully processes a SUBSCRIBE
Reference	ETSI TS 124 229 [1], clause 5.10.3.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B
}	

Expected Behaviour

ensure that {
when {
the UE_A sends a SUBSCRIBE "addressed to home network IMS_A" to the IMS_B entity
}
then {
the IMS_IBCF_B sends the SUBSCRIBE containing
Route indicating value PX_IBCF_B_SIP_URI
to the IMS_IBCF_A and
the IMS_IBCF_B receives the 200_OK
from the IMS_A and
the IMS_IBCF_B forwards the 200_OK
to the IMS_P_CSCF_B entity
}
}

TP Id	TP_IC_IBCF_NOTIFY_01
Test Objective	Verify that the IBCF successfully processes a NOTIFY in case of IMS Administrative de-registration
Reference	ETSI TS 124 229 [1], clause 5.10.3.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_IBCF_B receives a NOTIFY containing
Event indicating value "reg,de-reg"
from the IMS_A entity
}
then {
the IMS_IBCF_B sends the NOTIFY
to the IMS_P_CSCF_B and
the IMS_IBCF_B receives a 200_OK
from the IMS_P_CSCF_B and
the IMS_IBCF_B forwards the 200_OK
to the IMS_A entity
}
}	

7.3 Gm interface

TP Id	TP_GM_PCSCF_MESSAGE_01
Test Objective	Verify that the P-CSCF successfully processes a SIP messages greater than 1 300 bytes
Reference	ETSI TS 124 229 [1], clause 4.2A (1st paragraph)
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour

```
ensure that {
    when {
        the UE_A isRequestedToSend a MESSAGE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            ContentLength indicating value greater than 1 300 bytes
        to the IMS_P_CSCF_A entity
    }
    then {
        the IMS_P_CSCF_A receives the MESSAGE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            ContentLength indicating value greater than 1 300 bytes
        from the UE_A entity
        and the IMS_P_CSCF_A sends a 200_Ok containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            PChargingVector containing
                orig_ioi indicating value PX_OPERATOR_ID_A,
                term_ioi indicating value PX_OPERATOR_ID_B,
            not PAccessNetworkInfo
        to the UE_A entity
    }
}
```

TP Id	TP_GM_PCSCF_REGISTER_01
Test Objective	Verify that the P-CSCF successfully processes a first registration (Successful)
Reference	ETSI TS 124 229 [1], clauses 5.1.1.1, 6.1.1 and 6.1.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isNotRegisteredTo the IMS_A and
the UE_B isNotRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the UE_A isTriggeredToStart
    }
    then {
        the UE_A sends a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Authorization containing
                Authentication_Schema indicating value PX_TO_BE_DEFINED,
                Authentication_URI indicating value PX_TO_BE_DEFINED,
                Username indicating value PX_UE_A_USERNAME,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value "",
                not term_ioi,
            not SecurityClient
        to the IMS_P_CSCF_A entity
        and the UE_A receives an 401_Unauthorized containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Path,
            Warning,
            PAccessNetworkInfo,
            WwwAuthenticate containing
                Digest,
                Realm indicating value PX_UE_A_REALM,
```

```
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value "not empty",
                qop indicating value "auth"
        from the IMS_P_CSCF_A entity
    }
}
```

TP Id	TP_GM_PCSCF_REGISTER_02
Test Objective	Verify that the P-CSCF successfully processes a full registration (Successful)
Reference	ETSI TS 124 229 [1], clauses 5.1.1.1, 6.1.1 and 6.1.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isNotRegisteredTo the IMS_A and
the UE_B isNotRegisteredTo the IMS_B and
the UE_A hasAchievedFirstRegistration
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Authorization containing
                Authentication_Schema indicating value PX_TO_BE_DEFINED,
                Authentication_URI indicating value PX_TO_BE_DEFINED,
                Username indicating value PX_UE_A_USERNAME,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value "not empty",
                qop indicating value "auth",
            not SecurityClient
        from the UE_A entity
    }
    then {
        the IMS_P_CSCF_A sends an 200_Ok containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            AuthenticationInfo,
            PAccessNetworkInfo,
            PAssociatedURI indicating value PX_UE_A_SIP_URI,
            PChargingVector,
               orig_ioi_parameter
                   indicating value "Operator Identifier Of ImsA" ,
               term_ioi_parameter
                   indicating value "Operator Identifier Of ImsB"
            Path,
            ServiceRoute
        to the UE_A entity
    }
}
```

TP Id	TP_GM_PCSCF_REGISTER_03
Test Objective	Verify that the P-CSCF successfully processes an invalid first registration (Unsuccessful)
Reference	ETSI TS 124 229 [1], clauses 5.1.1.1, 6.1.1 and 6.1.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isNotRegisteredTo the IMS_A and
the UE_B isNotRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the UE_A isTriggeredToStart
    }
    then {
        the IMS_P_CSCF_A receives a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Authorization containing
                Authentication_Schema indicating value PX_TO_BE_DEFINED,
                Authentication_URI indicating value PX_TO_BE_DEFINED,
                Username indicating value PX_UE_A_INVALID_USERNAME,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value ""
        from the UE_A entity
        and the IMS_P_CSCF_A sends an 404_NotFound containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID
        to the UE_A entity
    }
}
```

TP Id	TP_GM_PCSCF_REGISTER_04
Test Objective	Verify that the P-CSCF successfully processes a first registration (Successful)
Reference	ETSI TS 124 229 [1], clauses 5.1.1.1, 6.1.1 and 6.1.3
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_A isNotRegisteredTo the IMS_B and
the UE_B isNotRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the UE_A isTriggeredToStart
    }
    then {
        the UE_A sends a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Authorization containing
                Authentication_Schema indicating value PX_TO_BE_DEFINED,
                Authentication_URI indicating value PX_TO_BE_DEFINED,
                Username indicating value PX_UE_A_USERNAME,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value "",
                not term_ioi,
            not SecurityClient
        to the IMS_P_CSCF_B entity
        and the UE_A receives an 401_Unauthorized containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Path,
            Warning,
            PAccessNetworkInfo,
            PVisitedNetwork,
            WwwAuthenticate containing
                Digest,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value "not empty",
                qop indicating value "auth"
        from the IMS_P_CSCF_B entity
```

```
    }
}
```

TP Id	TP_GM_PCSCF_REGISTER_05
Test Objective	Verify that the P-CSCF successfully processes a full registration (Successful)
Reference	ETSI TS 124 229 [1], clauses 5.1.1.1 and 6.1.13
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_A isNotRegisteredTo the IMS_B and
the UE_B isNotRegisteredTo the IMS_B and
the UE_A hasAchievedFirstRegistration
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_B receives a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Authorization containing
                Authentication_Schema indicating value PX_TO_BE_DEFINED,
                Authentication_URI indicating value PX_TO_BE_DEFINED,
                Username indicating value PX_UE_A_USERNAME,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value "not empty",
                qop indicating value "auth",
            not SecurityClient
        from the UE_A entity
    }
    then {
        the IMS_P_CSCF_B sends an 200_Ok containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            AuthenticationInfo,
            PAccessNetworkInfo,
            PAssociatedURI indicating value PX_UE_A_SIP_URI,
            PVisitedNetwork,
            PChargingVector,
               orig_ioi_parameter
                   indicating value "Operator Identifier Of ImsA" ,
               term_ioi_parameter
                   indicating value "Operator Identifier Of ImsB"
            Path,
            ServiceRoute
        to the UE_A entity
    }
}
```

TP Id	TP_GM_PCSCF_REGISTER_06
Test Objective	Verify that the P-CSCF successfully processes an invalid first registration (Unsuccessful)
Reference	ETSI TS 124 229 [1], clauses 5.1.1.1 and 6.1.1
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_A isNotRegisteredTo the IMS_B and
the UE_B isNotRegisteredTo the IMS_B
        }
```

Expected Behaviour

ensure that {
  when {
  the UE_A isTriggeredToStart
  }
  then {
  the IMS_P_CSCF_B receives a REGISTER containing
  From indicating value PX_UE_A_SIP_URI,
  To indicating value PX_UE_A_SIP_URI,
  CallId indicating value PX_UE_A_CALLID,
  Via indicating value PX_UE_A_VIA,
  Authorization containing
  Authentication_Schema indicating value PX_TO_BE_DEFINED,
  Authentication_URI indicating value PX_TO_BE_DEFINED,
  Username indicating value PX_UE_A_INVALID_USERNAME,
  Realm indicating value PX_UE_A_REALM,
  Algorithm indicating value PX_UE_A_AUTH_ALG,
  Nonce indicating value ""
  and the IMS_P_CSCF_B sends an 404_NotFound containing
  From indicating value PX_UE_A_SIP_URI,
  To indicating value PX_UE_A_SIP_URI,
  CallId indicating value PX_UE_A_CALLID
  }
}

TP Id	TP_GM_PCSCF_REGISTER_07
Test Objective	Verify that the P-CSCF successfully processes a user de-registration (no SIP session active)
Reference	ETSI TS 124 229 [1], clauses 5.2.5.1 and 6.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
  }	

Expected Behaviour	

ensure that {
  when {
  the UE_A isTriggeredToDetachUser
  }
  then {
  the UE_A sends a REGISTER containing
  Expire indicating value 0
  to the IMS_P_CSCF_A entity
  }
}	

TP Id	TP_GM_PCSCF_REGISTER_08
Test Objective	Verify that the P-CSCF successfully processes a user de-registration (no SIP session active)
Reference	ETSI TS 124 229 [1], clauses 5.2.5.1 and 6.1
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B
  }	

Expected Behaviour	

ensure that {
  when {
  the UE_A isTriggeredToDetachUser
  }
  then {
  the IMS_P_CSCF_B receives a REGISTER containing
  Expire indicating value 0
  from the UE_A entity
  }
}	

TP Id	TP_GM_PCSCF_REGISTER_10
Test Objective	Verify that the P-CSCF successfully processes a user de-registration (with SIP session active)
Reference	ETSI TS 124 229 [1], clauses 5.2.5.1 and 6.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A previouslyEstablishedCallWith the UE_B
}	

Expected Behaviour	

ensure that {
when {
the UE_A isTriggeredToDetachUser
}
then {
the UE_A sends a REGISTER containing
Expire indicating value 0
to the IMS_P_CSCF_A and
the UE_A receives a BYE
from the IMS_P_CSCF_A entity
}
}	

TP Id	TP_GM_PCSCF_SUBSCRIBE_01
Test Objective	Verify that the P-CSCF successfully processes a SUBSCRIBE
Reference	ETSI TS 124 229 [1], clauses 5.1.1.1, 6.1.1 and 6.1.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the UE_A isRequestedToSend a SUBSCRIBE
}
then {
the IMS_P_CSCF_A receives an SUBSCRIBE containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE
from the UE_A entity
and the IMS_P_CSCF_A sends a 200_Ok containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA
to the UE_A entity
}
}	

TP Id	TP_GM_PCSCF_SUBSCRIBE_02
Test Objective	Verify that the P-CSCF successfully processes a SUBSCRIBE
Reference	ETSI TS 124 229 [1], clauses 5.1.1.1, 6.1.1 and 6.1.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B
}	

Expected Behaviour

ensure that {
when {
the UE_A isRequestedToSend a SUBSCRIBE
}
then {
the UE_A sends an SUBSCRIBE containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE
to the IMS_P_CSCF_B entity
and the UE_A receives a 200_Ok containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
PVisitedNetwork
to the IMS_P_CSCF_B entity
}
}

TP Id	TP_GM_PCSCF_NOTIFY_01
Test Objective	Verify that the P-CSCF successfully processes a NOTIFY in case of IMS Administrative de-registration
Reference	ETSI TS 124 229 [1], clauses 5.1.2.1, 6.1.1 and 6.1.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_S_CSCF_A isRequestedToSend a NOTIFY
}
then {
the IMS_P_CSCF_A sends an NOTIFY containing
Event indicating value "reg,de-reg"
to the UE_A entity
}
}	

TP Id	TP_GM_PCSCF_NOTIFY_02
Test Objective	Verify that the P-CSCF successfully processes a NOTIFY in case of IMS Administrative de-registration
Reference	ETSI TS 124 229 [1], clauses 5.1.2.1, 6.1.1 and 6.1.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_B receives a NOTIFY containing
Event indicating value "reg,de-reg"
 	
}
then {
the IMS_P_CSCF_B sends an NOTIFY containing
Event indicating value "reg,de-reg"
to the UE_A and
the UE_A sends a 200_Ok
to the IMS_P_CSCF_B entity
}
}	

TP Id	TP_GM_PCSCF_200OK_01
Test Objective	Verify that the P-CSCF successfully processes a 200 (OK) NOTIFY (IMS Administrative de-registration)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_S_CSCF_A isRequestedToSend a NOTIFY containing
Event indicating value "reg,de-reg"
 	
}
then {
the UE_A sends a 200_Ok
to the IMS_P_CSCF_A entity
}
}	

TP Id	TP_GM_PCSCF_INVITE_01
Test Objective	Verify that the P-CSCF successfully processes an initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7.2, 5.4.4.1, 5.4.4.2 and 6.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the UE_A isRequestedToSend an INVITE
}
then {
the IMS_P_CSCF_A receives an INVITE containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE,
PAccessNetworkInfo,
MessageBody containing
SDP containing
Version indicating value "0"
from the UE_A entity
}
}	

TP Id	TP_GM_PCSCF_INVITE_02
Test Objective	Verify that the P-CSCF successfully processes an initial INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7.3 and 6.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the UE_A isRequestedToSend an INVITE
    }
    then {
        the IMS_P_CSCF_B sends an INVITE containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE,
            PAccessNetworkInfo,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
        to the UE_B entity
    }
}
```

TP Id	TP_GM_PCSCF_INVITE_03
Test Objective	Verify that the P-CSCF successfully processes an initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7.2 and 6.1
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the UE_A isRequestedToSend an INVITE
    }
    then {
        the IMS_P_CSCF_B receives an INVITE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
        from the UE_A entity
    }
}
```

TP Id	TP_GM_PCSCF_INVITE_04
Test Objective	Verify that the P-CSCF successfully processes an initial INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7.3 and 6.1
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the UE_B isRequestedToSend an INVITE
}
then {
the IMS_P_CSCF_A sends an INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE,
PAccessNetworkInfo,
MessageBody containing
SDP containing
Version indicating value "0"
to the UE_B entity
}
}	

TP Id	TP_GM_PCSCF_100TRY_01
Test Objective	Verify that the P-CSCF successfully processes a 100 (Trying) provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.3.5 and 6.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the UE_A hasAchievedInitialINVITE
}
then {
the IMS_P_CSCF_A sends a 100_Trying
to the UE_A entity
}
}	

TP Id	TP_GM_PCSCF_100TRY_02
Test Objective	Verify that the P-CSCF successfully processes a 100 (Trying) provisional response on initial INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.3.5 and 6.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour

ensure that {
when {
the UE_B sends a 100_Trying containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
to the IMS_P_CSCF_B entity
}
then {
the IMS_P_CSCF_B receives a 100_Trying containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
from the UE_B entity
}
}

TP Id	TP_GM_PCSCF_100TRY_03
Test Objective	Verify that the P-CSCF successfully processes a 100 (Trying) provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.3.5 and 6.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the UE_A hasAchievedInitialINVITE
}
then {
the IMS_P_CSCF_B sends a 100_Trying
to the UE_A entity
}
}	

TP Id	TP_GM_PCSCF_100TRY_04
Test Objective	Verify that the P-CSCF successfully processes a 100 (Trying) provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.3.5 and 6.1
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the UE_B sends a 100_Trying containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
to the IMS_P_CSCF_A entity
}
then {
the IMS_P_CSCF_A receives a 100_Trying containing	

```
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE
        from the UE_B entity
    }
}
```

TP Id	TP_GM_PCSCF_180RINGING_01
Test Objective	Verify that the P-CSCF successfully processes a 180 (Ringing) provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.3.5 and 6.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the UE_A hasAchievedInitialINVITE
    }
    then {
        the IMS_P_CSCF_A sends a 180_Ringing containing
            not PChargingVector,
            not PChargingFunctionAddresses,
            not PPreferredIdentity
        to the UE_A entity
    }
}
```

TP Id	TP_GM_PCSCF_180RINGING_02
Test Objective	Verify that the P-CSCF successfully processes a 180 (Ringing) provisional response on initial INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.3.5 and 6.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the UE_B sends a 180_Ringing containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE,
            not PChargingVector,
            not PChargingFunctionAddresses,
            not PPreferredIdentity
        to the IMS_P_CSCF_B entity
    }
    then {
        the IMS_P_CSCF_B receives a 180_Ringing containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE,
            not PChargingVector,
            not PChargingFunctionAddresses,
```

```
            not PPreferredIdentity
        from the UE_B entity
    }
}
```

TP Id	TP_GM_PCSCF_180RINGING_03
Test Objective	Verify that the P-CSCF successfully processes a 180 (Ringing) provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.3.5 and 6.1
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the UE_A hasAchievedInitialINVITE
    }
    then {
        the IMS_P_CSCF_B sends a 180_Ringing containing
            not PChargingVector,
            not PChargingFunctionAddresses,
            not PPreferredIdentity
        to the UE_A entity
    }
}
```

TP Id	TP_GM_PCSCF_180RINGING_04
Test Objective	Verify that the P-CSCF successfully processes a 180 (Ringing) provisional response on initial INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.3.5 and 6.1
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the UE_B sends a 180_Ringing containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE,
            not PChargingVector,
            not PChargingFunctionAddresses,
            not PPreferredIdentity
        to the IMS_P_CSCF_A entity
    }
    then {
        the IMS_P_CSCF_A receives a 180_Ringing containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE,
            not PChargingVector,
            not PChargingFunctionAddresses,
            not PPreferredIdentity
        from the UE_B entity
    }
}
```

TP Id	TP_GM_PCSCF_200OK_01
Test Objective	Verify that the P-CSCF successfully processes a 200 (OK) provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the UE_A hasAchievedInitialINVITE
    }
    then {
        the IMS_P_CSCF_A sends a 200_Ok containing
            not PChargingVector,
            not PChargingFunctionAddresses,
            not PPreferredIdentity
        to the UE_A entity
    }
}
```

TP Id	TP_GM_PCSCF_200OK_02
Test Objective	Verify that the P-CSCF successfully processes a 200 (Ok) provisional response on initial INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.4 and 6.1.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the UE_B sends a 200_Ok containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE,
            not PChargingVector,
            not PChargingFunctionAddresses,
            not PPreferredIdentity
        from the IMS_P_CSCF_B entity
    }
    then {
        the IMS_P_CSCF_B receives a 200_Ok containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE,
            not PChargingVector,
            not PChargingFunctionAddresses,
            not PPreferredIdentity
        from the UE_B entity
    }
}
```

TP Id	TP_GM_PCSCF_200OK_03
Test Objective	Verify that the P-CSCF successfully processes a 200 (OK) provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1.1
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the UE_A hasAchievedInitialINVITE
    }
    then {
        the IMS_P_CSCF_B sends a 200_Ok containing
            not PChargingVector,
            not PChargingFunctionAddresses,
            not PPreferredIdentity
        to the UE_A entity
    }
}
```

TP Id	TP_GM_PCSCF_200OK_04
Test Objective	Verify that the P-CSCF successfully processes a 200 (Ok) provisional response on initial INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.4 and 6.1.1
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the UE_B sends a 200_Ok containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE,
            not PChargingVector,
            not PChargingFunctionAddresses,
            not PPreferredIdentity
        from the IMS_P_CSCF_A entity
    }
    then {
        the IMS_P_CSCF_A receives a 200_Ok containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE,
            not PChargingVector,
            not PChargingFunctionAddresses,
            not PPreferredIdentity
        from the UE_B entity
    }
}
```

TP Id	TP_GM_PCSCF_ACK_01
Test Objective	Verify that the P-CSCF successfully processes a ACK provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the UE_A hasAchievedINVITE
}
then {
the IMS_P_CSCF_A receives an ACK containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE
from the UE_A entity
}
}	

TP Id	TP_GM_PCSCF_ACK_02
Test Objective	Verify that the P-CSCF successfully processes a ACK provisional response on initial INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the UE_B hasAchievedInitialINVITE
}
then {
the UE_B receives an ACK containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
from the IMS_P_CSCF_B entity
}
}	

TP Id	TP_GM_PCSCF_ACK_03
Test Objective	Verify that the P-CSCF successfully processes a ACK provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1.1
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour

ensure that {
  when {
  the UE_A hasAchievedINVITE
  }
  then {
  the IMS_P_CSCF_B receives an ACK containing
  From indicating value PX_UE_A_SIP_URI,
  To indicating value PX_UE_B_SIP_URI,
  CallId indicating value PX_UE_A_CALLID,
  Via indicating value PX_UE_A_VIA,
  Route indicating value PX_UE_A_SERVICE_ROUTE
  from the UE_A entity
  }
}

TP Id	TP_GM_PCSCF_ACK_04
Test Objective	Verify that the P-CSCF successfully processes a ACK provisional response on initial INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1.1
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A
  }	

Expected Behaviour	

ensure that {
  when {
  the IMS_P_CSCF_A receives an ACK containing
  From indicating value PX_UE_A_SIP_URI,
  To indicating value PX_UE_B_SIP_URI,
  CallId indicating value PX_UE_A_CALLID,
  Via indicating value PX_UE_A_VIA,
  Route indicating value PX_UE_A_SERVICE_ROUTE
  to the IMS_S_CSCF_A entity
  }
  then {
  the IMS_P_CSCF_A sends an ACK containing
  From indicating value PX_UE_A_SIP_URI,
  To indicating value PX_UE_B_SIP_URI,
  CallId indicating value PX_UE_A_CALLID,
  Via indicating value PX_UE_A_VIA,
  Route indicating value PX_UE_A_SERVICE_ROUTE
  from the UE_B entity
  }
}	

TP Id	TP_GM_PCSCF_RE_INVITE_01
Test Objective	Verify that the P-CSCF successfully processes an initial RE-INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A previouslyEstablishedCallWith the UE_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the UE_A isRequestedToSend an ReINVITE
    }
    then {
        the IMS_P_CSCF_A receives an ReINVITE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
        from the UE_A entity
    }
}
```

TP Id	TP_GM_PCSCF_RE_INVITE_02
Test Objective	Verify that the P-CSCF successfully processes an initial RE-INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_B previouslyEstablishedCallWith the UE_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the UE_B isRequestedToSend an ReINVITE
    }
    then {
        the IMS_P_CSCF_B sends an ReINVITE containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE,
            PAccessNetworkInfo,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
        from the UE_B entity
    }
}
```

TP Id	TP_GM_PCSCF_RE_INVITE_03
Test Objective	Verify that the P-CSCF successfully processes an initial RE-INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1.1
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_A previouslyEstablishedCallWith the UE_B
}	

Expected Behaviour	

ensure that {
when {
the UE_A isRequestedToSend an ReINVITE
}
then {
the IMS_P_CSCF_B receives an ReINVITE containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE,
PAccessNetworkInfo,
MessageBody containing
SDP containing
Version indicating value "0"
from the UE_B entity
}
}	

TP Id	TP_GM_PCSCF_RE_INVITE_04
Test Objective	Verify that the P-CSCF successfully processes an initial RE-INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1.1
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A and
the UE_B previouslyEstablishedCallWith the UE_A
}	

Expected Behaviour	

ensure that {
when {
the UE_A isRequestedToSend an ReINVITE
}
then {
the IMS_P_CSCF_A sends an ReINVITE containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE,
PAccessNetworkInfo,
MessageBody containing
SDP containing
Version indicating value "0"
from the UE_B entity
}
}	

TP Id	TP_GM_PCSCF_BYE_01
Test Objective	Verify that the P-CSCF successfully processes a BYE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.5 (1st paragraph), 5.2.8.2 and 6.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A previouslyEstablishedCallWith the UE_B
}	

Expected Behaviour	

ensure that {
when {
the UE_A isRequestedToSend a BYE
}
then {
the IMS_P_CSCF_A receives a BYE containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE
from the UE_A entity
}
}	

TP Id	TP_GM_PCSCF_BYE_02
Test Objective	Verify that the P-CSCF successfully processes a BYE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.5 (1st paragraph), 5.2.8.2 and 6.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_B previouslyEstablishedCallWith the UE_A
}	

Expected Behaviour	

ensure that {
when {
the UE_A isRequestedToSend a BYE
}
then {
the IMS_P_CSCF_B sends an BYE containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE
to the UE_B entity
}
}	

TP Id	TP_GM_PCSCF_BYE_03
Test Objective	Verify that the P-CSCF successfully processes a BYE (Network initiated)
Reference	ETSI TS 124 229 [1], clauses 5.1.5 (1st paragraph), 5.2.8.2 and 6.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_B previouslyEstablishedCallWith the UE_A
}	

Expected Behaviour

ensure that {
  when {
  the UE_A isNoLongerAvailable
  }
  then {
  the IMS_P_CSCF_A sends an BYE containing
  From indicating value PX_UE_B_SIP_URI,
  To indicating value PX_UE_A_SIP_URI,
  CallId indicating value PX_UE_B_CALLID,
  Via indicating value PX_UE_B_VIA,
  Route indicating value PX_UE_B_SERVICE_ROUTE
  to the UE_A entity
  }
}

TP Id	TP_GM_PCSCF_BYE_04
Test Objective	Verify that the P-CSCF successfully processes a BYE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.5 (1st paragraph), 5.2.8.2 and 6.1
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_A previouslyEstablishedCallWith the UE_B
  }	

Expected Behaviour	

ensure that {
  when {
  the UE_A isRequestedToSend a BYE
  }
  then {
  the IMS_P_CSCF_B receives a BYE containing
  From indicating value PX_UE_A_SIP_URI,
  To indicating value PX_UE_B_SIP_URI,
  CallId indicating value PX_UE_A_CALLID,
  Via indicating value PX_UE_A_VIA,
  Route indicating value PX_UE_A_SERVICE_ROUTE
  from the UE_A entity
  }
}	

TP Id	TP_GM_PCSCF_BYE_05
Test Objective	Verify that the P-CSCF successfully processes a BYE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.5 (1st paragraph), 5.2.8.2 and 6.1
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A and
the UE_A previouslyEstablishedCallWith the UE_B
  }	

Expected Behaviour	

ensure that {
  when {
  the UE_B isRequestedToSend a BYE
  }
  then {
  the IMS_P_CSCF_A receives an BYE containing
  From indicating value PX_UE_A_SIP_URI,
  To indicating value PX_UE_B_SIP_URI,
  CallId indicating value PX_UE_A_CALLID,
  Via indicating value PX_UE_A_VIA,
  Route indicating value PX_UE_A_SERVICE_ROUTE
  from the UE_B entity	

```
    }
}
```

TP Id	TP_GM_PCSCF_BYE_06
Test Objective	Verify that the P-CSCF successfully processes a BYE (Network initiated)
Reference	ETSI TS 124 229 [1], clauses 5.1.5 (1st paragraph), 5.2.8.2 and 6.1
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A and
the UE_B previouslyEstablishedCallWith the UE_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_A isRequestedToSend a BYE
    }
    then {
        the IMS_P_CSCF_A sends an BYE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        to the UE_B entity
    }
}
```

TP Id	TP_GM_PCSCF_200OK_BYE_01
Test Objective	Verify that the P-CSCF successfully processes a 200 (OK) BYE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.5 and 6.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A sends a 200_Ok containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE
        from the IMS_S_CSCF_A entity
    }
    then {
        the IMS_P_CSCF_A sends a 200_Ok containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE,
            not PChargingVector,
            not PChargingFunctionAddresses,
            not PPreferredIdentity
        to the UE_A entity
    }
}
```

TP Id	TP_GM_PCSCF_200OK_BYE_02
Test Objective	Verify that the P-CSCF successfully processes a 200 (OK) BYE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.5 and 6.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_B receives a 200_Ok containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the IMS_S_CSCF_B entity
    }
    then {
        the IMS_P_CSCF_B sends a 200_Ok containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            not PChargingVector,
            not PChargingFunctionAddresses,
            not PPreferredIdentity
        to the UE_B entity
    }
}
```

TP Id	TP_GM_PCSCF_200OK_BYE_03
Test Objective	Verify that the P-CSCF successfully processes a 200 (OK) BYE (Network initiated)
Reference	ETSI TS 124 229 [1], clauses 5.1.5 and 6.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives a 200_Ok
    }
    then {
        the IMS_P_CSCF_A sends a 200_Ok containing
            not PChargingVector,
            not PChargingFunctionAddresses,
            not PPreferredIdentity
        to the IMS_S_CSCF_A entity
    }
}
```

TP Id	TP_GM_PCSCF_200OK_BYE_04
Test Objective	Verify that the P-CSCF successfully processes a 200 (OK) BYE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.5 and 6.1
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_B receives a 200_Ok containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
from the IMS_S_CSCF_B entity
}
then {
the IMS_P_CSCF_B sends a 200_Ok containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE,
not PChargingVector,
not PChargingFunctionAddresses,
not PPreferredIdentity
to the UE_A entity
}
}	

TP Id	TP_GM_PCSCF_200OK_BYE_05
Test Objective	Verify that the P-CSCF successfully processes a 200 (OK) BYE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.5 and 6.1
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_A receives a 200_Ok containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE
from the IMS_S_CSCF_A entity
}
then {
the IMS_P_CSCF_A sends a 200_Ok containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE,
not PChargingVector,
not PChargingFunctionAddresses,
not PPreferredIdentity
to the UE_B entity
}
}	

TP Id	TP_GM_PCSCF_200OK_BYE_06
Test Objective	Verify that the P-CSCF successfully processes a 200 (OK) BYE (Network initiated)
Reference	ETSI TS 124 229 [1], clauses 5.1.5 and 6.1
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_A receives a 200_Ok
}
then {
the IMS_P_CSCF_A sends a 200_Ok containing
not PChargingVector,
not PChargingFunctionAddresses,
not PPreferredIdentity
to the IMS_S_CSCF_A entity
}
}	

TP Id	TP_GM_PCSCF_CANCEL_01
Test Objective	Verify that the P-CSCF successfully processes a CANCEL (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A hasAchievedInitialINVITE
}	

Expected Behaviour	

ensure that {
when {
the UE_A isRequestedToSend a CANCEL
}
then {
the IMS_P_CSCF_A receives a CANCEL containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE
from the UE_A entity
}
}	

TP Id	TP_GM_PCSCF_CANCEL_02
Test Objective	Verify that the P-CSCF successfully processes a CANCEL (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A hasAchievedInitialINVITE
}	

Expected Behaviour

ensure that {
when {
the UE_A isRequestedToSend a CANCEL
}
then {
the IMS_P_CSCF_B sends a CANCEL containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE
to the UE_B entity
}
}

TP Id	TP_GM_PCSCF_CANCEL_03
Test Objective	Verify that the P-CSCF successfully processes a CANCEL (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_A hasAchievedInitialINVITE
}	

Expected Behaviour	

ensure that {
when {
the UE_A isRequestedToSend a CANCEL
}
then {
the IMS_P_CSCF_B receives an CANCEL containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE
from the UE_A entity
}
}	

TP Id	TP_GM_PCSCF_CANCEL_04
Test Objective	Verify that the P-CSCF successfully processes a CANCEL (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_B hasAchievedInitialINVITE
}	

Expected Behaviour	

ensure that {
when {
the UE_A isRequestedToSend a CANCEL
}
then {
the IMS_P_CSCF_A sends an CANCEL containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE
to the UE_B entity	

```
    }
}
```

TP Id	TP_GM_PCSCF_200OK_CANCEL_01
Test Objective	Verify that the P-CSCF successfully processes a 200 (OK) CANCEL (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the UE_A isRequestedToSend a CANCEL
    }
    then {
        the IMS_P_CSCF_A receives a 200_Ok containing
            not PChargingVector,
            not PChargingFunctionAddresses,
            not PPreferredIdentity
        from the IMS_S_CSCF_A entity
    }
}
```

TP Id	TP_GM_PCSCF_200OK_CANCEL_02
Test Objective	Verify that the P-CSCF successfully processes a 200 (OK) CANCEL (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the UE_B isRequestedToSend a CANCEL
    }
    then {
        the IMS_P_CSCF_B receives a 200_Ok containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE,
            not PChargingVector,
            not PChargingFunctionAddresses,
            not PPreferredIdentity
        from the UE_B entity
    }
}
```

TP Id	TP_GM_PCSCF_200OK_CANCEL_03
Test Objective	Verify that the P-CSCF successfully processes a 200 (OK) CANCEL (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1.1
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_B isRequestedToSend a 200_Ok
}
then {
the IMS_P_CSCF_B sends a 200_Ok containing
not PChargingVector,
not PChargingFunctionAddresses,
not PPreferredIdentity
to the UE_A entity
}
}	

TP Id	TP_GM_PCSCF_200OK_CANCEL_04
Test Objective	Verify that the P-CSCF successfully processes a 200 (OK) CANCEL (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.4 and 6.1.1
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the UE_A receives a CANCEL
from the IMS_P_CSCF_A entity
}
then {
the UE_B sends a 200_Ok containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE,
not PChargingVector,
not PChargingFunctionAddresses,
not PPreferredIdentity
to the IMS_P_CSCF_A entity
}
}	

TP Id	TP_GM_PCSCF_486INVITE_01
Test Objective	Verify that the P-CSCF successfully processes a 486 INVITE (busy) to reject call (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_B isBusy
        }
```

Expected Behaviour

```
ensure that {
    when {
        the UE_B isRequestedToSend an 486_INVITE
    }
    then {
        the IMS_P_CSCF_A sends a 486_INVITE containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE
        to the UE_A entity
    }
}
```

TP Id	TP_GM_PCSCF_486INVITE_02
Test Objective	Verify that the P-CSCF successfully processes a 486 INVITE (busy) to reject call (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_B isBusy
        }
```

Expected Behaviour

```
ensure that {
    when {
        the UE_B isRequestedToSend a 486_INVITE
    }
    then {
        the IMS_P_CSCF_B receives a 486_INVITE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the UE_B entity
    }
}
```

TP Id	TP_GM_PCSCF_486INVITE_03
Test Objective	Verify that the P-CSCF successfully processes a 486 INVITE (busy) to reject call (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_B isBusy
}	

Expected Behaviour	

ensure that {
when {
the UE_B isRequestedToSend an 486_INVITE
}
then {
the IMS_P_CSCF_B sends a 486_INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
to the UE_A entity
}
}	

TP Id	TP_GM_PCSCF_486INVITE_04
Test Objective	Verify that the P-CSCF successfully processes a 486 INVITE (busy) to reject call (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A and
the UE_A isBusy
}	

Expected Behaviour	

ensure that {
when {
the UE_A isRequestedToSend a 486_INVITE
}
then {
the IMS_P_CSCF_A receives a 486_INVITE containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE
from the UE_B entity
}
}	

TP Id	TP_GM_PCSCF_487INVITE_01
Test Objective	Verify that the P-CSCF successfully processes a 487 INVITE (Request Terminated) (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the UE_A isRequestedToSend an CANCEL
}
then {
the IMS_P_CSCF_A sends a 487_INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
to the UE_A entity
}
}	

TP Id	TP_GM_PCSCF_487INVITE_02
Test Objective	Verify that the P-CSCF successfully processes a 487 INVITE (Request Terminated) (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the UE_A isRequestedToSend a CANCEL
}
then {
the IMS_P_CSCF_B receives a 487_INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE,
not PChargingVector,
not PChargingFunctionAddresses,
not PPreferredIdentity
from the UE_B entity
}
}	

TP Id	TP_GM_PCSCF_487INVITE_03
Test Objective	Verify that the P-CSCF successfully processes a 487 INVITE (Request Terminated) (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_A hasAchievedInitialINVITE
        }
```

Expected Behaviour

```
ensure that {
    when {
        the UE_A isRequestedToSend an CANCEL
    }
    then {
        the IMS_P_CSCF_B sends a 487_INVITE containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE
        to the UE_A entity
    }
}
```

TP Id	TP_GM_PCSCF_487INVITE_04
Test Objective	Verify that the P-CSCF successfully processes a 487 INVITE (Request Terminated) (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_A isRequestedToSend a CANCEL
        }
```

Expected Behaviour

```
ensure that {
    when {
        the UE_A isRequestedToSend a CANCEL
    }
    then {
        the IMS_P_CSCF_A receives a 487_INVITE containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE,
            not PChargingVector,
            not PChargingFunctionAddresses,
            not PPreferredIdentity
        from the UE_B entity
    }
}
```

7.4 Cx interface

TP Id	TP_CX_HSS_MAA_01
Test Objective	IUT successfully processes all mandatory AVPs in a MA-Request received due to S-CSCF registration notification procedure and sends SA-Answer
Reference	ETSI TS 129 228 [3], clause 6.1.2 ETSI TS 129 229 [4], clauses 6.1.3 and 6.1.4
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isNotRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_S_CSCF_A sends a MAR containing
Session_ID_AVP
Vendor_Specific_Application_Id_AVP
Auth_Session_State_AVP
indicating value NO_STATE_MAINTAINED
Origin_Host_AVP
Origin_Realm_AVP
Destination_Realm_AVP
Public_Identity_AVP
User_Name_AVP
Server_Name_AVP
SIP_Number_Auth_Items_AVP
SIP_Auth_Data_Item_AVP containing
SIP_Authentication_Scheme_AVP
to the IMS_HSS_A entity
}
then {
the IMS_HSS_A sends the MAA containing
Session_ID_AVP,
Vendor_Specific_Application_Id_AVP,
Auth_Session_State_AVP,
Origin_Host_AVP,
Origin_Realm_AVP,
not Experimental_Result_AVP,
Result_Code_AVP
indicating value DIAMETER_SUCCESS
User_Name_AVP,
SIP_Number_Auth_Items_AVP,
SIP_Auth_Data_Item_AVP containing
SIP_Authentication_Scheme_AVP
to the IMS_S_CSCF_A entity
}
}	

TP Id	TP_CX_HSS_RTA_01
Test Objective	IUT successfully processes all mandatory AVPs in a RT-Request received due to S-CSCF network de-registration notification procedure and sends RT-Answer
Reference	ETSI TS 129 228 [3], clause 6.1.3 ETSI TS 129 229 [4], clauses 6.1.9 and 6.1.10
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_S_CSCF_A sends a RTR containing
Session_ID_AVP
Vendor_Specific_Application_Id_AVP
Auth_Session_State_AVP
indicating value NO_STATE_MAINTAINED
Origin_Host_AVP
Origin_Realm_AVP
Destination_Host_AVP	

```
            Destination_Realm_AVP
            User_Name_AVP
            Deregistration_Reason_AVP containing
                Reason_Code_AVP
        to the IMS_HSS_A entity
    }
    then {
        the IMS_HSS_A sends the RTA containing
            Session_ID_AVP
            Vendor_Specific_Application_Id_AVP
            Auth_Session_State_AVP
            Origin_Host_AVP
            Origin_Realm_AVP
            Result_Code_AVP
                indicating value DIAMETER_SUCCESS
        to the IMS_S_CSCF_A entity
    }
}
```

TP Id	TP_CX_HSS_SAA_01
Test Objective	IUT successfully processes all mandatory AVPs in a SA-Request received due to S-CSCF registration notification procedure and sends SA-Answer
Reference	ETSI TS 129 228 [3], clause 6.3 ETSI TS 129 229 [4], clauses 6.1.7 and 6.1.8
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isNotRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_A sends a SAR containing
            Session_ID_AVP,
            Vendor_Specific_Application_Id_AVP,
            Auth_Session_State_AVP
                indicating value NO_STATE_MAINTAINED,
            Origin_Host_AVP,
            Origin_Realm_AVP,
            Public_Identity_AVP,
            not User_Name_AVP,
            Destination_Realm_AVP,
            Server_Name_AVP,
            Server_Assignment_Type_AVP
                indicating value REGISTRATION
            User_Data_Already_Available_AVP
        to the IMS_HSS_A entity
    }
    then {
        the IMS_HSS_A sends the SAA containing
            Session_ID_AVP
            Vendor_Specific_Application_Id_AVP
            Auth_Session_State_AVP
            Origin_Host_AVP
            Origin_Realm_AVP
            Result_Code_AVP
                indicating value DIAMETER_SUCCESS
            User_Data AVP
            Charging_Information_AVP
        to the IMS_S_CSCF_A entity
    }
}
```

TP Id	TP_CX_HSS_SAA_02
Test Objective	IUT successfully processes all mandatory AVPs in an SA-Request received due to S-CSCF de-registration procedure and sends SA-Answer
Reference	ETSI TS 129 228 [3], clauses 6.1.2.1 and A.4.3 ETSI TS 129 229 [4], clauses 6.1.3 and 6.1.4
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_S_CSCF_A sends a SAR containing
Session_ID_AVP
Vendor_Specific_Application_Id_AVP
Auth_Session_State_AVP
indicating value NO_STATE_MAINTAINED,
Origin_Host_AVP
Origin_Realm_AVP
Public_Identity_AVP
User_Name_AVP
Destination_Realm_AVP
Server_Name_AVP
Server_Assignment_Type_AVP
indicating value USER_DEREGISTRATION
User_Data_Already_Available_AVP
to the IMS_HSS_A entity
}
then {
the IMS_HSS_A sends the SAA containing
Session_ID_AVP
Vendor_Specific_Application_Id_AVP
Auth_Session_State_AVP
Origin_Host_AVP
Origin_Realm_AVP
Result_Code_AVP
indicating value DIAMETER_SUCCESS
to the IMS_S_CSCF_A entity
}
}	

TP Id	TP_CX_HSS_UAA_01
Test Objective	IUT successfully processes all mandatory AVPs in a UA-Request received due to first UE initial registration and sends UA-Answer
Reference	ETSI TS 129 228 [3], clause 6.1.1 and tables 6.1.1.1 and 6.1.1.2 ETSI TS 129 229 [4], clauses 6.1.1 and 6.1.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isNotRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_I_CSCF_A sends a UAR containing
Session_ID_AVP
Vendor_Specific_Application_Id_AVP
Auth_Session_State_AVP
indicating value NO_STATE_MAINTAINED,
Origin_Host_AVP
Origin_Realm_AVP
Public_Identity_AVP
Visited_Network_Identifier_AVP
User_Authorization_Type_AVP
indicating value REGISTRATION,
User_Name_AVP
Destination_Host_AVP
Destination_Realm_AVP
to the IMS_HSS_A entity
}	

```
    then {
        the IMS_HSS_A sends the UAA containing
            Session_ID_AVP,
            Vendor_Specific_Application_Id_AVP,
            Auth_Session_State_AVP,
            Origin_Host_AVP,
            Origin_Realm_AVP,
            not Result_Code_AVP
            Experimental_Result_AVP containing
                Experimental_Result_Code_AVP
                    indicating value DIAMETER_FIRST_REGISTRATION
        to the IMS_I_CSCF_A entity
    }
}
```

TP Id	TP_CX_HSS_UAA_02
Test Objective	IUT successfully processes all mandatory AVPs in a UA-Request received due to protected UE initial registration and sends UA-Answer
Reference	ETSI TS 129 228 [3], clause 6.1.1.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isNotRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_I_CSCF_A sends a UAR containing
            Public_Identity_AVP
            User_Name_AVP
        to the IMS_HSS_A entity
    }
    then {
        the IMS_HSS_A sends the UAA containing
            not Result_Code_AVP,
            Experimental_Result_AVP containing
                Experimental_Result_Code_AVP
                    indicating value DIAMETER_SUBSEQUENT_REGISTRATION,
            Server_Name_AVP,
            not Server_Capabilities_AVP
        to the IMS_I_CSCF_A entity
    }
}
```

TP Id	TP_CX_HSS_UAA_03
Test Objective	Verify that the IUT checks that the Private User Identity and the Public User Identity exists in the HSS and if not then IUT sets the appropriate experimental result code in the UA-Answer
Reference	ETSI TS 129 228 [3], clause 6.1.1.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isNotRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_I_CSCF_A sends a UAR containing
        User_Name_AVP
            indicating value "an unknown private user identity"
        Public_Identity_AVP

        to the IMS_HSS_A entity
    }
    then {
        the IMS_HSS_A sends the UAA containing
            not Result_Code_AVP,
            Experimental_Result_AVP containing
                Experimental_Result_Code_AVP
                    indicating value DIAMETER_ERROR_USER_UNKNOWN,
            not Server_Name_AVP
```

```
        to the IMS_I_CSCF_A entity
    }
}
```

TP Id	TP_CX_HSS_UAA_04
Test Objective	IUT successfully processes all mandatory AVPs in a UA-Request received due to UE de-registration and sends UA-Answer
Reference	ETSI TS 129 228 [3], clause 6.1.1.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_I_CSCF_A sends a UAR containing
            Public_Identity_AVP,
            User_Name_AVP,
            User_Authentication_Type_AVP
                indicating value DE_REGISTRATION,
            Visited_Network_Identifier_AVP
        to the IMS_HSS_A entity
    }
    then {
        the IMS_HSS_A sends the UAA containing
            Result_Code_AVP
                indicating value DIAMETER_SUCCESS,
            Server_Name_AVP,
            not Server_Capabilities_AVP
        to the IMS_I_CSCF_A entity
    }
}
```

7.5 Mw interface

7.5.1 Mw interface at P-CSCF

TP Id	TP_MW_PCSCF_MESSAGE_01
Test Objective	Verify that the P-CSCF successfully processes a SIP messages greater than 1 300 bytes
Reference	ETSI TS 124 229 [1], clause 4.2A
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives a MESSAGE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            ContentLength indicating value greater than 1 300 bytes
        from the UE_A entity
    }
    then {
        the IMS_P_CSCF_A forwards the MESSAGE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            PChargingVector containing
                icid_value,
                orig_value,
```

```
            not PAccessNetworkInfo,
            ContentLength indicating value greater than 1 300 bytes
        to the IMS_S_CSCF_A entity
    }
}
```

TP Id	TP_MW_PCSCF_REGISTER_01
Test Objective	Verify that the P-CSCF successfully processes a first registration (Successful)
Reference	ETSI TS 124 229 [1], clauses 5.2.2.1 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isNotRegisteredTo the IMS_A and
the UE_B isNotRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA
        from the UE_A entity
    }
    then {
        the IMS_P_CSCF_A sends a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Path indicating value PX_P_CSCF_A_SIP_URI,
            PChargingVector containing
                icid indicating value PX_TO_BE_DEFINED,
            PVisitedNetworkID indicating value PX_TO_BE_DEFINED,
            Require indicating value "path",
            Supported indicating value "path"
            to the IMS_I_CSCF_A entity
        and the IMS_P_CSCF_A sends an 401_Unauthorized containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Path,
            Warning,
            PAccessNetworkInfo,
            WwwAuthenticate containing
                Digest,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value "not empty",
                qop indicating value "auth"
        to the UE_A entity
    }
}
```

TP Id	TP_MW_PCSCF_REGISTER_02
Test Objective	Verify that the P-CSCF successfully processes a full registration (Successful)
Reference	ETSI TS 124 229 [1], clauses 5.2.2.1 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isNotRegisteredTo the IMS_A and
the UE_B isNotRegisteredTo the IMS_B and
the UE_A hasAchievedFirstREGISTER
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Authorization containing
                Authentication_Scheme indicating value PX_TO_BE_DEFINED,
                Authentication_URI indicating value PX_TO_BE_DEFINED,
                Username indicating value PX_UE_A_USERNAME,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value "not empty",
                qop indicating value "auth"
        from the UE_A entity
    }
    then {
        the IMS_P_CSCF_A sends a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Authorization containing
                Authentication_Scheme indicating value PX_TO_BE_DEFINED,
                Authentication_URI indicating value PX_TO_BE_DEFINED,
                Username indicating value PX_UE_A_USERNAME,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value "not empty",
                qop indicating value "auth",
            PChargingVector
        to the IMS_I_CSCF_A entity
        and the IMS_P_CSCF_A sends an 200_Ok containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            AuthenticationInfo,
            PAccessNetworkInfo,
            PAssociatedURI indicating value PX_UE_A_SIP_URI,
            PChargingVector,
               orig_ioi_parameter
                   indicating value "Operator Identifier Of ImsA" ,
               term_ioi_parameter
                   indicating value "Operator Identifier Of ImsB"
            Path,
            ServiceRoute
        to the UE_A entity
    }
}
```

TP Id	TP_MW_PCSCF_REGISTER_03
Test Objective	Verify that the P-CSCF successfully processes an invalid first registration (Unsuccessful)
Reference	ETSI TS 124 229 [1], clauses 5.2.2.1 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isNotRegisteredTo the IMS_A and
the UE_B isNotRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Authorization containing
                Authentication_Schema indicating value PX_TO_BE_DEFINED,
                Authentication_URI indicating value PX_TO_BE_DEFINED,
                Username indicating value PX_UE_A_INVALID_USERNAME,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value ""
        from the UE_A entity
    }
    then {
        the IMS_P_CSCF_A sends a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Authorization containing
                Authentication_Scheme indicating value PX_TO_BE_DEFINED,
                Authentication_URI indicating value PX_TO_BE_DEFINED,
                Username indicating value PX_UE_A_INVALID_USERNAME,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value "not empty",
                qop indicating value "auth",
            PChargingVector
        to the IMS_I_CSCF_A entity
        and the IMS_I_CSCF_A sends an 404_NotFound containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID
        to the IMS_P_CSCF_A entity
    }
}
```

TP Id	TP_MW_PCSCF_REGISTER_04
Test Objective	Verify that the P-CSCF successfully processes a first registration (Successful)
Reference	ETSI TS 124 229 [1], clauses 5.2.2.1 and 6.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_A isNotRegisteredTo the IMS_B and
the UE_B isNotRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_B receives a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA
        from the UE_A entity
    }
    then {
```

```
        the IMS_P_CSCF_B sends a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Path indicating value PX_P_CSCF_A_SIP_URI,
            PChargingVector containing
                icid indicating value PX_TO_BE_DEFINED,
            PVisitedNetworkID indicating value PX_TO_BE_DEFINED,
            Require indicating value "path",
            Supported indicating value "path"
        to the IMS_S_CSCF_B entity
        and the IMS_P_CSCF_B sends an 401_Unauthorized containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Path,
            Warning,
            PAccessNetworkInfo,
            WwwAuthenticate containing
                Digest,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value "not empty",
                qop indicating value "auth"
        to the UE_A entity
    }
}
```

TP Id	TP_MW_PCSCF_REGISTER_05
Test Objective	Verify that the P-CSCF successfully processes a full registration (Successful)
Reference	ETSI TS 124 229 [1], clauses 5.2.2.1 and 6.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_A isNotRegisteredTo the IMS_B and
the UE_B isNotRegisteredTo the IMS_B and
the UE_A hasAchievedFirstREGISTER
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_B receives a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Authorization containing
                Authentication_Scheme indicating value PX_TO_BE_DEFINED,
                Authentication_URI indicating value PX_TO_BE_DEFINED,
                Username indicating value PX_UE_A_USERNAME,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value "not empty",
                qop indicating value "auth"
        from the UE_A entity
    }
    then {
        the IMS_P_CSCF_B sends a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Authorization containing
                Authentication_Scheme indicating value PX_TO_BE_DEFINED,
                Authentication_URI indicating value PX_TO_BE_DEFINED,
                Username indicating value PX_UE_A_USERNAME,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value "not empty",
                qop indicating value "auth",
            PChargingVector,
```

```
            PVisitedNetwork
        to the IMS_I_CSCF_B entity
        and the IMS_P_CSCF_B sends an 200_Ok containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            AuthenticationInfo,
            PAccessNetworkInfo,
            PAssociatedURI indicating value PX_UE_A_SIP_URI,
            PChargingVector,
               orig_ioi_parameter
                   indicating value "Operator Identifier Of ImsA" ,
               term_ioi_parameter
                   indicating value "Operator Identifier Of ImsB"
            Path,
            ServiceRoute,
            PVisitedNetwork
        to the UE_A entity
    }
}
```

TP Id	TP_MW_PCSCF_REGISTER_06
Test Objective	Verify that the P-CSCF successfully processes an invalid first registration (Unsuccessful)
Reference	ETSI TS 124 229 [1], clauses 5.2.2.1 and 6.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_A isNotRegisteredTo the IMS_B and
the UE_B isNotRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_B sends a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Authorization containing
                Authentication_Schema indicating value PX_TO_BE_DEFINED,
                Authentication_URI indicating value PX_TO_BE_DEFINED,
                Username indicating value PX_UE_A_INVALID_USERNAME,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value ""
        to the UE_A entity
    }
    then {
        the IMS_P_CSCF_B sends a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Authorization containing
                Authentication_Scheme indicating value PX_TO_BE_DEFINED,
                Authentication_URI indicating value PX_TO_BE_DEFINED,
                Username indicating value PX_UE_A_INVALID_USERNAME,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value "not empty",
                qop indicating value "auth",
            PChargingVector,
            PVisitedNetwork
        to the IMS_S_CSCF_B entity
        and the IMS_P_CSCF_B sends an 404_NotFound containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID
        to the UE_A entity
    }
}
```

TP Id	TP_MW_PCSCF_REGISTER_07
Test Objective	Verify that the P-CSCF successfully processes a user de-registration (no SIP session active)
Reference	ETSI TS 124 229 [1], clauses 5.2.5.1 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_A receives a REGISTER containing
Expire indicating value 0
from the UE_A entity
}
then {
the IMS_P_CSCF_A sends a REGISTER containing
Expire indicating value 0
to the IMS_I_CSCF_A entity
}
}	

TP Id	TP_MW_PCSCF_REGISTER_08
Test Objective	Verify that the P-CSCF successfully processes a user de-registration (no SIP session active)
Reference	ETSI TS 124 229 [1], clauses 5.2.5.1 and 6.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_B receives a REGISTER containing
Expire indicating value 0
from the UE_A entity
}
then {
the IMS_P_CSCF_B sends a REGISTER containing
Expire indicating value 0
to the IMS_S_CSCF_B entity
}
}	

TP Id	TP_MW_PCSCF_REGISTER_09
Test Objective	Verify that the P-CSCF successfully processes a network de-registration (no SIP session active)
Reference	ETSI TS 124 229 [1], clauses 5.2.5 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_A isTriggeredToDetachUser
}
then {
the IMS_P_CSCF_A sends a REGISTER containing
Expire indicating value 0
to the IMS_I_CSCF_A entity
}
}	

TP Id	TP_MW_PCSCF_REGISTER_10
Test Objective	Verify that the P-CSCF successfully processes a user de-registration (with SIP session active)
Reference	ETSI TS 124 229 [1], clauses 5.2.5.1 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A previouslyEstablishedCallWith the UE_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_A receives a REGISTER containing
Expire indicating value 0
from the UE_A entity
}
then {
the IMS_P_CSCF_A sends a REGISTER containing
Expire indicating value 0
to the IMS_I_CSCF_A and
the IMS_P_CSCF_A sends a BYE
to the UE_A entity
}
}	

TP Id	TP_MW_PCSCF_REGISTER_11
Test Objective	Verify that the P-CSCF successfully processes a user network detachment
Reference	ETSI TS 124 229 [1], clauses 5.2.5.1 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the UE_A isRequestedToDetachfromNetwork
}
then {
the IMS_P_CSCF_A sends a BYE
to the IMS_S_CSCF_A and
the IMS_P_CSCF_A receives a 200_Ok
from the IMS_S_CSCF_A and
the IMS_P_CSCF_A sends a REGISTER containing
Expire indicating value 0
to the IMS_I_CSCF_A and
the IMS_P_CSCF_A receives a 200_Ok
from the IMS_I_CSCF_A entity
}
}	

TP Id	TP_MW_PCSCF_REGISTER_12
Test Objective	Verify that the P-CSCF successfully processes a network de-registration (no SIP session active)
Reference	ETSI TS 124 229 [1], clauses 5.2.5 and 6.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_B isTriggeredToDetachUser
}
then {
the IMS_P_CSCF_B sends a REGISTER containing
From indicating value PX_IMS_P_CSCF_B_SIP_URI,
To indicating value PX_I_CSCF_A_SIP_URI,
Event indicating value "reg,de-reg",
Expire indicating value 0
to the IMS_S_CSCF_B entity
}
}	

TP Id	TP_MW_PCSCF_REGISTER_13
Test Objective	Verify that the P-CSCF successfully processes a user network detachment
Reference	ETSI TS 124 229 [1], clauses 5.2.5.1 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the UE_A isRequestedToDetachfromNetwork
}
then {
the IMS_P_CSCF_B sends a REGISTER containing
Expire indicating value 0
to the IMS_S_CSCF_B and
the IMS_P_CSCF_B receives a 200_Ok
from the IMS_S_CSCF_B entity
}
}	

TP Id	TP_MW_PCSCF_SUBSCRIBE_01
Test Objective	Verify that the P-CSCF successfully processes a SUBSCRIBE
Reference	ETSI TS 124 229 [1], clauses 5.2.3B and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_A receives an SUBSCRIBE containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE,
Event,
Expires
from the UE_A entity	

```
    }
    then {
        the IMS_P_CSCF_A sends an SUBSCRIBE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            Event,
            Expires
        to the IMS_S_CSCF_A entity
        and the IMS_P_CSCF_A receives a 200_Ok containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA
        from the IMS_S_CSCF_A entity
    }
}
```

TP Id	TP_MW_PCSCF_SUBSCRIBE_02
Test Objective	Verify that the P-CSCF successfully processes a SUBSCRIBE
Reference	ETSI TS 124 229 [1], clauses 5.2.3B and 6.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_B receives an SUBSCRIBE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            Event,
            Expires
        from the UE_A entity
    }
    then {
        the IMS_P_CSCF_B sends an SUBSCRIBE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            Event,
            Expires
        to the IMS_S_CSCF_B entity
        and the IMS_P_CSCF_B receives a 200_Ok containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA
        to the IMS_S_CSCF_B entity
    }
}
```

TP Id	TP_MW_PCSCF_NOTIFY_01
Test Objective	Verify that the P-CSCF successfully processes a NOTIFY in case of IMS Administrative de-registration
Reference	ETSI TS 124 229 [1], clauses 5.2.5.2 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_A receives a NOTIFY containing
From indicating value PX_S_CSCF_A_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
Event indicating value "reg,de-reg"
from the IMS_S_CSCF_A entity
}
then {
the IMS_P_CSCF_A sends an NOTIFY containing
Event indicating value "reg,de-reg"
to the UE_A entity
}
}	

TP Id	TP_MW_PCSCF_NOTIFY_02
Test Objective	Verify that the P-CSCF successfully processes a NOTIFY in case of IMS Administrative de-registration
Reference	ETSI TS 124 229 [1], clauses 5.2.5.2 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_A receives a NOTIFY containing
From indicating value PX_S_CSCF_A_SIP_URI,
To indicating value PX_P_CSCF_A_SIP_URI,
Event indicating value "reg,de-reg"
from the IMS_S_CSCF_A entity
}
then {
the IMS_P_CSCF_A sends a 200_Ok
to the IMS_S_CSCF_A entity
}
}	

TP Id	TP_MW_PCSCF_NOTIFY_03
Test Objective	Verify that the P-CSCF successfully processes a NOTIFY in case of IMS Administrative de-registration
Reference	ETSI TS 124 229 [1], clauses 5.2.5.2 and 6.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_B receives a NOTIFY containing
From indicating value PX_S_CSCF_A_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
Event indicating value "reg,de-reg"
from the IMS_S_CSCF_B entity
}
then {
the IMS_P_CSCF_A sends an NOTIFY containing
Event indicating value "reg,de-reg"
to the UE_A and
the IMS_P_CSCF_A receives a 200_Ok
from the UE_A entity
}
}	

TP Id	TP_MW_PCSCF_200OK_NOTIFY_01
Test Objective	Verify that the P-CSCF successfully processes a 200 (OK) NOTIFY (IMS Administrative de-registration)
Reference	ETSI TS 124 229 [1], clause 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_A receives a 200_Ok
from the UE_A entity
}
then {
the IMS_P_CSCF_A sends a 200_Ok
to the IMS_S_CSCF_A entity
}
}	

TP Id	TP_MW_PCSCF_INVITE_01
Test Objective	Verify that the P-CSCF successfully processes an initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7.2 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives an INVITE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
        from the UE_A entity
    }
    then {
        the IMS_P_CSCF_A sends an INVITE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            ContentType indicating value "application/sdp",
            ContentLength,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
         to the IMS_S_CSCF_A entity
    }
}
```

TP Id	TP_MW_PCSCF_INVITE_02
Test Objective	Verify that the P-CSCF successfully processes an initial INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7.3 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_B receives an INVITE containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE,
            PAccessNetworkInfo,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
        from the IMS_S_CSCF_B entity
    }
    then {
        the IMS_P_CSCF_B sends an INVITE containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE,
            PAccessNetworkInfo,
            ContentType indicating value "application/sdp",
            ContentLength,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
         to the UE_B entity
    }
}
```

TP Id	TP_MW_PCSCF_INVITE_03
Test Objective	Verify that the P-CSCF successfully processes an initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7.2 and 6.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_B receives an INVITE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
        from the UE_A entity
    }
    then {
        the IMS_P_CSCF_B sends an INVITE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            ContentType indicating value "application/sdp",
            ContentLength,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
         to the IMS_S_CSCF_B entity
    }
}
```

TP Id	TP_MW_PCSCF_INVITE_04
Test Objective	Verify that the P-CSCF successfully processes an initial INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7.3 and 6.2
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives an INVITE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
        from the IMS_S_CSCF_A entity
    }
    then {
        the IMS_P_CSCF_A sends an INVITE containing
            From indicating value PX_UE_A_SIP_URI,
```

```
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            ContentType indicating value "application/sdp",
            ContentLength,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
         to the UE_B entity
    }
}
```

TP Id	TP_MW_PCSCF_100TRY_01
Test Objective	Verify that the P-CSCF successfully processes a 100 (Trying) provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.9.1 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_A receives a 100_Trying
from the IMS_S_CSCF_A entity
}
then {
the IMS_P_CSCF_A sends a 100_Trying
to the UE_A entity
}
}	

TP Id	TP_MW_PCSCF_100TRY_02
Test Objective	Verify that the P-CSCF successfully processes a 100 (Trying) provisional response on initial INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.9.2 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_B receives a 100_Trying
from the UE_B entity
}
then {
the IMS_P_CSCF_B sends a 100_Trying
to the IMS_S_CSCF_B entity
}
}	

TP Id	TP_MW_PCSCF_100TRY_03
Test Objective	Verify that the P-CSCF successfully processes a 100 (Trying) provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.9.2 and 6.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_B receives a 100_Trying
from the IMS_S_CSCF_B entity
}
then {
the IMS_P_CSCF_B sends a 100_Trying
to the UE_A entity
}
}	

TP Id	TP_MW_PCSCF_100TRY_04
Test Objective	Verify that the P-CSCF successfully processes a 100 (Trying) provisional response on initial INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.9.2 and 6.2
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_A receives a 100_Trying
from the UE_B entity
}
then {
the IMS_P_CSCF_A sends a 100_Trying
to the IMS_S_CSCF_A entity
}
}	

TP Id	TP_MW_PCSCF_180RINGING_01
Test Objective	Verify that the P-CSCF successfully processes a 180 (Ringing) provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.9.1 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour

ensure that {
when {
the IMS_P_CSCF_A receives a 180_Ringing
from the IMS_S_CSCF_A entity
}
then {
the IMS_P_CSCF_A sends a 180_Ringing
to the UE_A entity
}
}

TP Id	TP_MW_PCSCF_180RINGING_02
Test Objective	Verify that the P-CSCF successfully processes a 180 (Ringing) provisional response on initial INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.9.2 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_B receives a 180_Ringing
from the UE_B entity
}
then {
the IMS_P_CSCF_B sends a 180_Ringing
to the IMS_S_CSCF_B entity
}
}	

TP Id	TP_MW_PCSCF_180RINGING_03
Test Objective	Verify that the P-CSCF successfully processes a 180 (Ringing) provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.9.1 and 6.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_B receives a 180_Ringing
from the IMS_S_CSCF_B entity
}
then {
the IMS_P_CSCF_B sends a 180_Ringing
to the UE_A entity
}
}	

TP Id	TP_MW_PCSCF_180RINGING_04
Test Objective	Verify that the P-CSCF successfully processes a 180 (Ringing) provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.9.2 and 6.2
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_A receives a 180_Ringing
from the UE_B entity
}
then {
the IMS_P_CSCF_A sends a 180_Ringing
to the IMS_S_CSCF_A entity
}
}	

TP Id	TP_MW_PCSCF_200OK_01
Test Objective	Verify that the P-CSCF successfully processes a 200 (OK) provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_A receives a 200_Ok containing
not PChargingVector,
not PChargingFunctionAddresses,
not PPreferredIdentity
 	
from the IMS_S_CSCF_A entity
}
then {
the IMS_P_CSCF_A sends a 200_Ok containing
PChargingVector,
PChargingFunctionAddresses,
PPreferredIdentity
to the UE_A entity
}
}	

TP Id	TP_MW_PCSCF_200OK_02
Test Objective	Verify that the P-CSCF successfully processes a 200 (Ok) provisional response on initial INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour

ensure that {
when {
the IMS_P_CSCF_B receives a 200_Ok containing
PChargingVector,
PChargingFunctionAddresses,
PPreferredIdentity
from the UE_B entity
}
then {
the IMS_P_CSCF_B sends a 200_Ok containing
not PChargingVector,
not PChargingFunctionAddresses,
not PPreferredIdentity
to the IMS_S_CSCF_B entity
}
}

TP Id	TP_MW_PCSCF_200OK_03
Test Objective	Verify that the P-CSCF successfully processes a 200 (OK) provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_B receives a 200_Ok containing
not PChargingVector,
not PChargingFunctionAddresses,
not PPreferredIdentity
from the IMS_S_CSCF_B entity
}
then {
the IMS_P_CSCF_B sends a 200_Ok containing
PChargingVector,
PChargingFunctionAddresses,
PPreferredIdentity
to the UE_A entity
}
}	

TP Id	TP_MW_PCSCF_200OK_04
Test Objective	Verify that the P-CSCF successfully processes a 200 (Ok) provisional response on initial INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.2
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_A receives a 200_Ok containing
not PChargingVector,
not PChargingFunctionAddresses,
not PPreferredIdentity
from the UE_B entity
}
then {	

```
        the IMS_P_CSCF_A sends a 200_Ok containing
            PChargingVector,
            PChargingFunctionAddresses,
            PPreferredIdentity
        to the IMS_S_CSCF_A entity
    }
}
```

TP Id	TP_MW_PCSCF_ACK_01
Test Objective	Verify that the P-CSCF successfully processes a ACK provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives an ACK containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the UE_A entity
    }
    then {
        the IMS_P_CSCF_A sends an ACK containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the IMS_S_CSCF_A entity
    }
}
```

TP Id	TP_MW_PCSCF_ACK_02
Test Objective	Verify that the P-CSCF successfully processes a ACK provisional response on initial INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_B receives an ACK containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the IMS_S_CSCF_B entity
    }
    then {
        the IMS_P_CSCF_B sends an ACK containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
```

```
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the UE_B entity
    }
}
```

TP Id	TP_MW_PCSCF_ACK_03
Test Objective	Verify that the P-CSCF successfully processes a ACK provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the UE_A sends an ACK containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the IMS_P_CSCF_B entity
    }
    then {
        the IMS_P_CSCF_B sends an ACK containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the IMS_S_CSCF_B entity
    }
}
```

TP Id	TP_MW_PCSCF_ACK_04
Test Objective	Verify that the P-CSCF successfully processes a ACK provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.2
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives an ACK containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the IMS_S_CSCF_A entity
    }
    then {
        the IMS_P_CSCF_A sends an ACK containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
```

```
        from the UE_B entity
    }
}
```

TP Id	TP_MW_PCSCF_RE_INVITE_01
Test Objective	Verify that the P-CSCF successfully processes an initial RE-INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A previouslyEstablishedCallWith the UE_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives a ReINVITE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
        from the UE_A entity
    }
    then {
        the IMS_P_CSCF_A sends a ReINVITE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
        to the IMS_S_CSCF_A entity
    }
}
```

TP Id	TP_MW_PCSCF_RE_INVITE_02
Test Objective	Verify that the P-CSCF successfully processes an initial RE-INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_B previouslyEstablishedCallWith the UE_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_B receives an ReINVITE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
```

```
        from the IMS_S_CSCF_B entity
    }
    then {
        the IMS_P_CSCF_B sends an ReINVITE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
        to the UE_B entity
    }
}
```

TP Id	TP_MW_PCSCF_RE_INVITE_03
Test Objective	Verify that the P-CSCF successfully processes an initial RE-INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1.1
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_A previouslyEstablishedCallWith the UE_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_B receives a ReINVITE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
        from the UE_A entity
    }
    then {
        the IMS_P_CSCF_B sends a ReINVITE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
        to the IMS_S_CSCF_B entity
    }
}
```

TP Id	TP_MW_PCSCF_RE_INVITE_04
Test Objective	Verify that the P-CSCF successfully processes an initial RE-INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1.1
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A and
the UE_B previouslyEstablishedCallWith the UE_A
        }
```

Expected Behaviour

ensure that {
when {
the IMS_P_CSCF_A receives an ReINVITE containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE,
PAccessNetworkInfo,
MessageBody containing
SDP containing
Version indicating value "0"
to the IMS_S_CSCF_A entity
}
then {
the IMS_P_CSCF_A receives an ReINVITE containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE,
PAccessNetworkInfo,
MessageBody containing
SDP containing
Version indicating value "0"
from the UE_B entity
}
}

TP Id	TP_MW_PCSCF_BYE_01
Test Objective	Verify that the P-CSCF successfully processes a BYE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.5, 5.4.5.2 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A previouslyEstablishedCallWith the UE_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_A receives an BYE containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE
from the UE_A entity
}
then {
the IMS_P_CSCF_A sends an BYE containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE
to the IMS_S_CSCF_A entity
}
}	

TP Id	TP_MW_PCSCF_BYE_02
Test Objective	Verify that the P-CSCF successfully processes a BYE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.5, 5.4.5.2 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_B previouslyEstablishedCallWith the UE_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_B receives an BYE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
from the IMS_S_CSCF_B entity
}
then {
the IMS_P_CSCF_B sends an BYE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
to the IMS_S_CSCF_B entity
}
}	

TP Id	TP_MW_PCSCF_BYE_03
Test Objective	Verify that the P-CSCF successfully processes a BYE (Originating Network)
Reference	ETSI TS 124 229 [1], clauses 5.1.5, 5.4.5.2 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_B previouslyEstablishedCallWith the UE_A
}	

Expected Behaviour	

ensure that {
when {
the UE_B isNoLongerAvailable
}
then {
the IMS_P_CSCF_A sends an BYE containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE
to the UE_A entity
}
}	

TP Id	TP_MW_PCSCF_BYE_04
Test Objective	Verify that the P-CSCF successfully processes a BYE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.5, 5.4.5.2 and 6.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_A previouslyEstablishedCallWith the UE_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_B receives an BYE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the UE_A entity
    }
    then {
        the IMS_P_CSCF_B sends an BYE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        to the IMS_S_CSCF_B entity
    }
}
```

TP Id	TP_MW_PCSCF_BYE_05
Test Objective	Verify that the P-CSCF successfully processes a BYE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.5, 5.4.5.2 and 6.2
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A and
the UE_A previouslyEstablishedCallWith the UE_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives an BYE containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE
        from the UE_B entity
    }
    then {
        the IMS_P_CSCF_A sends an BYE containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE
        to the IMS_S_CSCF_A entity
    }
}
```

TP Id	TP_MW_PCSCF_BYE_06
Test Objective	Verify that the P-CSCF successfully processes a BYE (Network initiated)
Reference	ETSI TS 124 229 [1], clauses 5.1.5, 5.4.5.2 and 6.2
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A and
the UE_A previouslyEstablishedCallWith the UE_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_A receives an BYE
from the IMS_S_CSCF_A entity
}
then {
the IMS_P_CSCF_A sends an BYE
from the UE_B entity
}
}	

TP Id	TP_MW_PCSCF_BYE_07
Test Objective	Verify that the P-CSCF successfully processes a user network detachment (with Previously Established IMS Registration & IMS Sessions)
Reference	ETSI TS 124 229 [1], clauses 5.2.5.1 and 6.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_A previouslyEstablishedCallWith the UE_B
}	

Expected Behaviour	

ensure that {
when {
the UE_A isRequestedToDetachfromNetwork
}
then {
the IMS_P_CSCF_B sends a BYE
to the IMS_S_CSCF_B and
the IMS_P_CSCF_B receives a 200_Ok
from the IMS_S_CSCF_B entity
}
}	

TP Id	TP_MW_PCSCF_200OK_BYE_01
Test Objective	Verify that the P-CSCF successfully processes a 200 (OK) BYE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_A receives a 200_Ok containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,	

```
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE
        from the IMS_S_CSCF_A entity
    }
    then {
        the IMS_P_CSCF_A sends a 200_Ok containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE
        to the UE_A entity
    }
}
```

TP Id	TP_MW_PCSCF_200OK_BYE_02
Test Objective	Verify that the P-CSCF successfully processes a 200 (OK) BYE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_B receives a 200_Ok containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the IMS_S_CSCF_B entity
    }
    then {
        the IMS_P_CSCF_B sends a 200_Ok containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        to the UE_B entity
    }
}
```

TP Id	TP_MW_PCSCF_200OK_BYE_03
Test Objective	Verify that the P-CSCF successfully processes a 200 (OK) BYE (Originating Network)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the UE_B isNoLongerAvailable
    }
    then {
        the IMS_P_CSCF_B sends a 200_Ok
        to the IMS_S_CSCF_B entity
    }
}
```

TP Id	TP_MW_PCSCF_200OK_BYE_04
Test Objective	Verify that the P-CSCF successfully processes a 200 (OK) BYE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_B receives a 200_Ok containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE
        from the IMS_S_CSCF_B entity
    }
    then {
        the IMS_P_CSCF_B sends a 200_Ok containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE
        to the UE_A entity
    }
}
```

TP Id	TP_MW_PCSCF_200OK_BYE_05
Test Objective	Verify that the P-CSCF successfully processes a 200 (OK) BYE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.2
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives a 200_Ok containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the IMS_S_CSCF_A entity
    }
    then {
        the IMS_P_CSCF_A sends a 200_Ok containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        to the UE_B entity
    }
}
```

TP Id	TP_MW_PCSCF_200OK_BYE_06
Test Objective	Verify that the P-CSCF successfully processes a 200 (OK) BYE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.2
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives a 200_Ok containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the UE_A entity
    }
    then {
        the IMS_P_CSCF_A sends a 200_Ok containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        to the IMS_S_CSCF_A entity
    }
}
```

TP Id	TP_MW_PCSCF_CANCEL_01
Test Objective	Verify that the P-CSCF successfully processes a CANCEL (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A hasAchievedInitialINVITE and
the UE_A isRequestedToSend a CANCEL
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives an CANCEL containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the UE_A entity
    }
    then {
        the IMS_P_CSCF_A sends an CANCEL containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        to the IMS_S_CSCF_A entity
    }
}
```

TP Id	TP_MW_PCSCF_CANCEL_02
Test Objective	Verify that the P-CSCF successfully processes a CANCEL (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_B hasAchievedInitialINVITE and
the UE_A isRequestedToSend a CANCEL
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_B receives a CANCEL containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the IMS_S_CSCF_B entity
    }
    then {
        the IMS_P_CSCF_B sends a CANCEL containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        to the UE_B entity
    }
}
```

TP Id	TP_MW_PCSCF_CANCEL_03
Test Objective	Verify that the P-CSCF successfully processes a CANCEL (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_A hasAchievedInitialINVITE and
the UE_A isRequestedToSend a CANCEL
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_B receives an CANCEL containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the UE_A entity
    }
    then {
        the IMS_P_CSCF_B sends an CANCEL containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        to the IMS_S_CSCF_B entity
    }
}
```

TP Id	TP_MW_PCSCF_CANCEL_04
Test Objective	Verify that the P-CSCF successfully processes a CANCEL (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.2
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A and
the UE_B hasAchievedInitialINVITE and
the UE_A isRequestedToSend a CANCEL
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives an CANCEL containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the IMS_S_CSCF_A entity
    }
    then {
        the IMS_P_CSCF_A sends an CANCEL containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the UE_B entity
    }
}
```

TP Id	TP_MW_PCSCF_486INVITE_01
Test Objective	Verify that the P-CSCF successfully processes a 486 INVITE (busy) to reject call (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_B isBusy
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives a 486_INVITE containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE
        from the IMS_S_CSCF_A entity
    }
    then {
        the IMS_P_CSCF_A sends a 486_INVITE containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE
        to the UE_A entity
    }
}
```

TP Id	TP_MW_PCSCF_486INVITE_02
Test Objective	Verify that the P-CSCF successfully processes a 486 INVITE (busy) to reject call (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_B isBusy
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_B receives a 486_INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
from the UE_B entity
}
then {
the IMS_P_CSCF_B sends a 486_INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
to the IMS_S_CSCF_B entity
}
}	

TP Id	TP_MW_PCSCF_486INVITE_03
Test Objective	Verify that the P-CSCF successfully processes a 486 INVITE (busy) to reject call (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_B isBusy
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_B receives a 486_INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
from the IMS_S_CSCF_B entity
}
then {
the IMS_P_CSCF_B sends a 486_INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
to the UE_A entity
}
}	

TP Id	TP_MW_PCSCF_486INVITE_04
Test Objective	Verify that the P-CSCF successfully processes a 486 INVITE (busy) to reject call (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.2
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A and
the UE_A isBusy
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_A receives a 486_INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
from the UE_A entity
}
then {
the IMS_P_CSCF_A sends a 486_INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
to the IMS_S_CSCF_A entity
}
}	

TP Id	TP_MW_PCSCF_487INVITE_01
Test Objective	Verify that the P-CSCF successfully processes a 487 INVITE (Request Terminated) to reject call (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A isRequestedToSend a CANCEL
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_A receives a 487_INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
from the IMS_S_CSCF_A entity
}
then {
the IMS_P_CSCF_A sends a 487_INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
to the UE_A entity
}
}	

TP Id	TP_MW_PCSCF_487INVITE_02
Test Objective	Verify that the P-CSCF successfully processes a 487 INVITE (Request Terminated) to reject call (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A isRequestedToSend a CANCEL
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_B receives a 487_INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
from the UE_B entity
}
then {
the IMS_P_CSCF_B sends a 487_INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
to the IMS_S_CSCF_B entity
}
}	

TP Id	TP_MW_PCSCF_487INVITE_03
Test Objective	Verify that the P-CSCF successfully processes a 487 INVITE (Request Terminated) to reject call (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_A isRequestedToSend a CANCEL
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_B receives a 487_INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
from the IMS_S_CSCF_B entity
}
then {
the IMS_P_CSCF_B sends a 487_INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
to the UE_A entity
}
}	

TP Id	TP_MW_PCSCF_487INVITE_04
Test Objective	Verify that the P-CSCF successfully processes a 487 INVITE (Request Terminated) to reject call (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_A isRequestedToSend a CANCEL
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_A receives a 487_INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
from the UE_B entity
}
then {
the IMS_P_CSCF_A sends a 487_INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
to the IMS_S_CSCF_A entity
}
}	

7.5.2 Mw interface at I-CSCF

TP Id	TP_MW_ICSCF_MESSAGE_01
Test Objective	Verify that the I-CSCF successfully processes a SIP messages greater than 1 300 bytes
Reference	ETSI TS 124 229 [1], clause 4.2A
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_I_CSCF_A receives a MESSAGE
containing ContentLength indicating value greater than 1 300 bytes
from the IMS_P_CSCF_A entity
}
then {
the IMS_I_CSCF_A forwards the MESSAGE
to the IMS_S_CSCF_A entity
}
}	

TP Id	TP_MW_ICSCF_REGISTER_01
Test Objective	Verify that the I-CSCF successfully processes a first registration (Successful)
Reference	ETSI TS 124 229 [1], clauses 5.4.1.1 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isNotRegisteredTo the IMS_A and
the UE_B isNotRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_I_CSCF_A receives a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA
        from the IMS_P_CSCF_A entity
    }
    then {
        the IMS_I_CSCF_A sends an 401_Unauthorized containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Path,
            Warning,
            PAccessNetworkInfo,
            WwwAuthenticate containing
                Digest,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value "not empty",
                qop indicating value "auth"
        to the IMS_S_CSCF_A entity
    }
}
```

TP Id	TP_MW_ICSCF_REGISTER_02
Test Objective	Verify that the I-CSCF successfully processes a full registration (Successful)
Reference	ETSI TS 124 229 [1], clauses 5.4.1.1 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isNotRegisteredTo the IMS_A and
the UE_B isNotRegisteredTo the IMS_B and
the UE_A hasAchievedFirstREGISTER
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_I_CSCF_A receives a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Authorization containing
                Authentication_Scheme indicating value PX_TO_BE_DEFINED,
                Authentication_URI indicating value PX_TO_BE_DEFINED,
                Username indicating value PX_UE_A_USERNAME,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value "not empty",
                qop indicating value "auth"
        from the IMS_P_CSCF_A entity
    }
    then {
        the IMS_I_CSCF_A sends an 200_Ok containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
```

```
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            AuthenticationInfo,
            PAccessNetworkInfo,
            PAssociatedURI indicating value PX_UE_A_SIP_URI,
            PChargingVector,
               orig_ioi_parameter
                   indicating value "Operator Identifier Of ImsA" ,
               term_ioi_parameter
                   indicating value "Operator Identifier Of ImsB"
            Path,
            ServiceRoute
        to the IMS_S_CSCF_A entity
    }
}
```

TP Id	TP_MW_ICSCF_REGISTER_03
Test Objective	Verify that the I-CSCF successfully processes an invalid first registration (Unsuccessful)
Reference	ETSI TS 124 229 [1], clauses 5.2.2.1 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isNotRegisteredTo the IMS_A and
the UE_B isNotRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_I_CSCF_A receives a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Authorization containing
                Authentication_Schema indicating value PX_TO_BE_DEFINED,
                Authentication_URI indicating value PX_TO_BE_DEFINED,
                Username indicating value PX_UE_A_INVALID_USERNAME,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value ""
        from the IMS_P_CSCF_A entity
    }
    then {
        the IMS_I_CSCF_A sends an 403_Forbiden containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID
        to the IMS_P_CSCF_A entity or
        the IMS_I_CSCF_A sends an 480_Temporary_Unavailable containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID
        to the IMS_P_CSCF_A entity
    }
}
```

TP Id	TP_MW_ICSCF_REGISTER_04
Test Objective	Verify that the I-CSCF successfully processes a first registration (Successful)
Reference	ETSI TS 124 229 [1], clauses 5.4.1.1 and 6.3
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isNotRegisteredTo the IMS_B and
the UE_B isNotRegisteredTo the IMS_B
        }
```

Expected Behaviour

ensure that {
when {
the IMS_I_CSCF_A receives a REGISTER containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
PVisitedNetworkID
from the IMS_IBCF_A entity
}
then {
the IMS_I_CSCF_A sends a REGISTER containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Path indicating value PX_P_CSCF_A_SIP_URI,
PChargingVector containing
icid indicating value PX_TO_BE_DEFINED,
PVisitedNetworkID indicating value PX_TO_BE_DEFINED,
Require_HDR indicating value "path",
Supported indicating value "path"
to the IMS_S_CSCF_A entity
and the IMS_I_CSCF_A sends an 401_Unauthorized containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Path,
Warning,
PAccessNetworkInfo,
PVisitedNetworkID,
WwwAuthenticate containing
Digest,
Realm indicating value PX_UE_A_REALM,
Algorithm indicating value PX_UE_A_AUTH_ALG,
Nonce indicating value "not empty",
qop indicating value "auth"
to the IMS_IBCF_A entity
}
}

TP Id	TP_MW_ICSCF_REGISTER_05
Test Objective	Verify that the I-CSCF successfully processes a full registration (Successful)
Reference	ETSI TS 124 229 [1], clauses 5.4.1.1 and 6.3
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE

Initial Conditions

with {
the UE_A isAttachedTo the EPC_B and
the UE_A isNotRegisteredTo the IMS_B and
the UE_B isNotRegisteredTo the IMS_B and
the UE_A hasAchievedFirstREGISTER
}

Expected Behaviour

ensure that {
when {
the IMS_I_CSCF_A receives a REGISTER containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Authorization containing
Authentication_Scheme indicating value PX_TO_BE_DEFINED,
Authentication_URI indicating value PX_TO_BE_DEFINED,
Username indicating value PX_UE_A_USERNAME,
Realm indicating value PX_UE_A_REALM,
Algorithm indicating value PX_UE_A_AUTH_ALG,
Nonce indicating value "not empty",
qop indicating value "auth"
from the IMS_IBCF_A entity
}
then {
the IMS_I_CSCF_B sends a REGISTER containing

```
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Authorization containing
                Authentication_Scheme indicating value PX_TO_BE_DEFINED,
                Authentication_URI indicating value PX_TO_BE_DEFINED,
                Username indicating value PX_UE_A_USERNAME,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value "not empty",
                qop indicating value "auth",
            PChargingVector
        to the IMS_S_CSCF_A entity
        and the IMS_I_CSCF_A sends an 200_Ok containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            AuthenticationInfo,
            PAccessNetworkInfo,
            PAssociatedURI indicating value PX_UE_A_SIP_URI,
            PChargingVector,
               orig_ioi_parameter
                   indicating value "Operator Identifier Of ImsA" ,
               term_ioi_parameter
                   indicating value "Operator Identifier Of ImsB"
            Path,
            ServiceRoute
        to the IMS_IBCF_A entity
    }
}
```

TP Id	TP_MW_ICSCF_REGISTER_06
Test Objective	Verify that the I-CSCF successfully processes an invalid first registration (Unsuccessful)
Reference	ETSI TS 124 229 [1], clauses 5.2.1, 5.2.2 and 6.3
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_A isNotRegisteredTo the IMS_B and
the UE_B isNotRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_I_CSCF_A receives a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Authorization containing
                Authentication_Schema indicating value PX_TO_BE_DEFINED,
                Authentication_URI indicating value PX_TO_BE_DEFINED,
                Username indicating value PX_UE_A_INVALID_USERNAME,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value ""
        to the IMS_IBCF_A entity
    }
    then {
        the IMS_I_CSCF_A sends an 404_NotFound containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID
        to the IMS_IBCF_A entity
    }
}
```

TP Id	TP_MW_ICSCF_REGISTER_07
Test Objective	Verify that the I-CSCF successfully processes a user de-registration (no SIP session active)
Reference	ETSI TS 124 229 [1], clauses 5.4.2 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_I_CSCF_A receives a REGISTER containing
Expire indicating value 0
from the IMS_P_CSCF_A entity
}
then {
the IMS_I_CSCF_A sends a REGISTER containing
Expire indicating value 0
to the IMS_S_CSCF_A entity
}
}	

TP Id	TP_MW_ICSCF_REGISTER_08
Test Objective	Verify that the I-CSCF successfully processes a user de-registration (no SIP session active)
Reference	ETSI TS 124 229 [1], clauses 5.4.1.5 and 6.3
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_S_CSCF_B receives a REGISTER containing
Expire indicating value 0
from the IMS_P_CSCF_B entity
}
then {
the IMS_S_CSCF_B forwards a REGISTER containing
Expire indicating value 0
to the IMS_I_CSCF_B entity
}
}	

TP Id	TP_MW_ICSCF_REGISTER_09
Test Objective	Verify that the P-CSCF successfully processes a network de-registration
Reference	ETSI TS 124 229 [1], clauses 5.2.5 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_B isTriggeredToDetachUser
}
then {
the IMS_I_CSCF_B sends a REGISTER containing
Expire indicating value 0
to the IMS_S_CSCF_B entity
}
}	

TP Id	TP_MW_ICSCF_REGISTER_10
Test Objective	Verify that the I-CSCF successfully processes a user de-registration (with SIP session active)
Reference	ETSI TS 124 229 [1], clauses 5.4.2 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A previouslyEstablishedCallWith the UE_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_I_CSCF_A receives a REGISTER containing
Expire indicating value 0
from the IMS_P_CSCF_A entity
}
then {
the IMS_I_CSCF_A sends a REGISTER containing
Expire indicating value 0
to the IMS_S_CSCF_A entity
}
}	

7.5.3 Mw interface at S-CSCF

TP Id	TP_MW_SCSCF_MESSAGE_01
Test Objective	Verify that the S-CSCF successfully processes a SIP messages greater than 1 300 bytes
Reference	ETSI TS 124 229 [1], clause 4.2A
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_S_CSCF_A receives a MESSAGE containing
ContentLength indicating value greater than 1 300 bytes
from the IMS_I_CSCF_A entity
}
then {
the IMS_S_CSCF_A forwards the MESSAGE containing
ContentLength indicating value greater than 1 300 bytes
to the IMS_IBCF_A entity
}
}	

TP Id	TP_MW_SCSCF_REGISTER_01
Test Objective	Verify that the S-CSCF successfully processes a first registration (Successful)
Reference	ETSI TS 124 229 [1], clause 5.3.1.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isNotRegisteredTo the IMS_A and
the UE_B isNotRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_S_CSCF_A receives a REGISTER containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_A_SIP_URI,	

```
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA
        from the IMS_I_CSCF_A entity
    }
    then {
        the IMS_S_CSCF_A sends an 401_Unauthorized containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Path,
            Warning,
            PAccessNetworkInfo,
            WwwAuthenticate containing
                Digest,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value "not empty",
                qop indicating value "auth"
        to the IMS_I_CSCF_A entity
    }
}
```

TP Id	TP_MW_SCSCF_REGISTER_02
Test Objective	Verify that the S-CSCF successfully processes a full registration (Successful)
Reference	ETSI TS 124 229 [1], clause 5.3.1.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isNotRegisteredTo the IMS_A and
the UE_B isNotRegisteredTo the IMS_B and
the UE_A hasAchievedFirstREGISTER
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_A receives a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Authorization containing
                Authentication_Scheme indicating value PX_TO_BE_DEFINED,
                Authentication_URI indicating value PX_TO_BE_DEFINED,
                Username indicating value PX_UE_A_USERNAME,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value "not empty",
                qop indicating value "auth"
        from the IMS_I_CSCF_A entity
    }
    then {
        the IMS_S_CSCF_A sends an 200_Ok containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            AuthenticationInfo,
            PAccessNetworkInfo,
            PAssociatedURI indicating value PX_UE_A_SIP_URI,
            PChargingVector,
               orig_ioi_parameter
                   indicating value "Operator Identifier Of ImsA" ,
               term_ioi_parameter
                   indicating value "Operator Identifier Of ImsB"
            Path,
            ServiceRoute
        to the IMS_I_CSCF_A entity
    }
}
```

TP Id	TP_MW_SCSCF_REGISTER_04
Test Objective	Verify that the S-CSCF successfully processes a first registration (Successful)
Reference	ETSI TS 124 229 [1], clause 5.3.1.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isNotRegisteredTo the IMS_B and
the UE_B isNotRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_B receives a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            PVisitedNetworkID
        from the IMS_I_CSCF_B entity
    }
    then {
        the IMS_S_CSCF_B sends a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Path indicating value PX_P_CSCF_A_SIP_URI,
            PChargingVector containing
                icid indicating value PX_TO_BE_DEFINED,
            PVisitedNetworkID indicating value PX_TO_BE_DEFINED,
            Require indicating value "path",
            Supported indicating value "path"
        to the IMS_IBCF_B entity
        and the IMS_S_CSCF_B sends an 401_Unauthorized containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Path,
            Warning,
            PVisitedNetworkID,
            PAccessNetworkInfo,
            WwwAuthenticate containing
                Digest,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value "not empty",
                qop indicating value "auth"
        to the IMS_I_CSCF_B entity
    }
}
```

TP Id	TP_MW_SCSCF_REGISTER_05
Test Objective	Verify that the S-CSCF successfully processes a full registration (Successful)
Reference	ETSI TS 124 229 [1], clause 5.3.1.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_A isNotRegisteredTo the IMS_B and
the UE_B isNotRegisteredTo the IMS_B and
the UE_A hasAchievedFirstREGISTER
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_B receives a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
```

```
            Authorization containing
                Authentication_Scheme indicating value PX_TO_BE_DEFINED,
                Authentication_URI indicating value PX_TO_BE_DEFINED,
                Username indicating value PX_UE_A_USERNAME,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value "not empty",
                qop indicating value "auth",
            PVisitedNetworkID
        from the IMS_I_CSCF_B entity
    }
    then {
        the IMS_S_CSCF_B sends a REGISTER containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Authorization containing
                Authentication_Scheme indicating value PX_TO_BE_DEFINED,
                Authentication_URI indicating value PX_TO_BE_DEFINED,
                Username indicating value PX_UE_A_USERNAME,
                Realm indicating value PX_UE_A_REALM,
                Algorithm indicating value PX_UE_A_AUTH_ALG,
                Nonce indicating value "not empty",
                qop indicating value "auth",
            PVisitedNetworkID,
            PChargingVector
        to the IMS_IBCF_B entity
        and the IMS_S_CSCF_B sends an 200_Ok containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            AuthenticationInfo,
            PVisitedNetworkID,
            PAccessNetworkInfo,
            PAssociatedURI indicating value PX_UE_A_SIP_URI,
            PChargingVector,
               orig_ioi_parameter
                   indicating value "Operator Identifier Of ImsA" ,
               term_ioi_parameter
                   indicating value "Operator Identifier Of ImsB"
            Path,
            ServiceRoute
        to the IMS_I_CSCF_B entity
    }
}
```

TP Id	TP_MW_SCSCF_REGISTER_07
Test Objective	Verify that the S-CSCF successfully processes a user de-registration (no SIP session active)
Reference	ETSI TS 124 229 [1], clauses 5.4.2 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_S_CSCF_A receives a REGISTER containing
Expire indicating value 0
from the IMS_I_CSCF_A entity
}
then {
the IMS_S_CSCF_A sends a 200_OK
to the IMS_I_CSCF_A entity
}
}	

TP Id	TP_MW_SCSCF_REGISTER_08
Test Objective	Verify that the S-CSCF successfully processes a user de-registration (no SIP session active)
Reference	ETSI TS 124 229 [1], clauses 5.4.1.5 and 6.3
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_IBCF_A receives a REGISTER containing
Expire indicating value 0
 	
from the IMS_IBCF_B entity
}
then {
the IMS_IBCF_A forwards a REGISTER containing
Expire indicating value 0
to the IMS_I_CSCF_A entity
and the IMS_I_CSCF_A forwards a REGISTER containing
Expire indicating value 0
to the IMS_S_CSCF_A entity
}
}	

TP Id	TP_MW_SCSCF_REGISTER_10
Test Objective	Verify that the S-CSCF successfully processes a user de-registration (with SIP session active)
Reference	ETSI TS 124 229 [1], clauses 5.4.2 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A previouslyEstablishedCallWith the UE_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_S_CSCF_A receives a REGISTER containing
Expire indicating value 0
from the IMS_I_CSCF_A entity
}
then {
the IMS_S_CSCF_A sends a BYE
to the IMS_P_CSCF_A and
the IMS_S_CSCF_A sends a BYE
to the IMS_IBCF_A and
the IMS_S_CSCF_A sends a 200 OK
to the IMS_P_CSCF_A entity
}
}	

TP Id	TP_MW_SCSCF_REGISTER_12
Test Objective	Verify that the S-CSCF successfully processes a network de-registration (no SIP session active)
Reference	ETSI TS 124 229 [1], clauses 5.2.5 and 6.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_B receives a REGISTER containing
            From indicating value PX_IMS_P_CSCF_B_SIP_URI,
            To indicating value PX_I_CSCF_A_SIP_URI,
            Event indicating value "reg,de-reg",
            Expire indicating value 0
        from the IMS_P_CSCF_B entity
    }
    then {
        the IMS_S_CSCF_B forwards a REGISTER
        to the IMS_IBCF_B entity
    }
}
```

TP Id	TP_MW_SCSCF_SUBSCRIBE_01
Test Objective	Verify that the S-CSCF successfully processes a SUBSCRIBE
Reference	ETSI TS 124 229 [1], clauses 5.4.2 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_A receives an SUBSCRIBE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            Event,
            Expires
        from the IMS_P_CSCF_A entity
    }
    then {
        the IMS_S_CSCF_A sends a 200_Ok containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA
        to the IMS_P_CSCF_A entity
    }
}
```

TP Id	TP_MW_SCSCF_SUBSCRIBE_02
Test Objective	Verify that the S-CSCF successfully processes a SUBSCRIBE
Reference	ETSI TS 124 229 [1], clauses 5.4.2 and 6.3
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_A receives an SUBSCRIBE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            Event,
            Expires
        to the IMS_IBCF_A entity
    }
    then {
        the IMS_S_CSCF_B sends a 200_Ok containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA
        to the IMS_IBCF_A entity
    }
}
```

TP Id	TP_MW_SCSCF_NOTIFY_01
Test Objective	Verify that the S-CSCF successfully processes a NOTIFY in case of IMS Administrative de-registration
Reference	ETSI TS 124 229 [1], clauses 5.2.5.2, 6.1.1 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_A isRequestedToDeregisterUser
    }
    then {
        the IMS_S_CSCF_A sends an NOTIFY containing
            Event indicating value "reg,de-reg"
         to the IMS_P_CSCF_A and
         the IMS_S_CSCF_A receives an 200_Ok
         from the IMS_P_CSCF_A and
         the IMS_S_CSCF_A sends an NOTIFY containing
            Event indicating value "de-reg"
         to the IMS_P_CSCF_A entity
    }
}
```

TP Id	TP_MW_SCSCF_NOTIFY_02
Test Objective	Verify that the S-CSCF successfully processes a NOTIFY in case of IMS Administrative de-registration
Reference	ETSI TS 124 229 [1], clauses 5.2.5.2, 6.1.1 and 6.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_S_CSCF_A isRequestedToSend a NOTIFY containing
Event indicating value "reg,de-reg"
}
then {
the IMS_S_CSCF_A sends an NOTIFY containing
Event indicating value "de-reg"
to the IMS_P_CSCF_A and
the IMS_S_CSCF_A receives an 200_Ok
from the IMS_P_CSCF_A entity
}
}	

TP Id	TP_MW_SCSCF_NOTIFY_03
Test Objective	Verify that the S-CSCF successfully processes a NOTIFY in case of IMS Administrative de-registration
Reference	ETSI TS 124 229 [1], clauses 5.2.5.2 and 6.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_S_CSCF_B receives a NOTIFY containing
From indicating value PX_S_CSCF_A_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
Event indicating value "reg,de-reg"
from the IMS_IBCF_B entity
}
then {
the IMS_S_CSCF_B sends an NOTIFY containing
Event indicating value "reg,de-reg"
to the IMS_P_CSCF_B and
the IMS_S_CSCF_B receives a 200_Ok
from the IMS_P_CSCF_B entity
}
}	

TP Id	TP_MW_SCSCF_NOTIFY_04
Test Objective	Verify that the S-CSCF successfully processes a NOTIFY in case of IMS Administrative de-registration
Reference	ETSI TS 124 229 [1], clauses 5.2.5.2 and 6.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B
}	

Expected Behaviour

ensure that {
when {
the IMS_S_CSCF_B receives a NOTIFY containing
From indicating value PX_A_CSCF_A_SIP_URI,
To indicating value PX_P_CSCF_B_SIP_URI,
Event indicating value "reg,de-reg"
from the IMS_IBCF_B entity
}
then {
the IMS_S_CSCF_B sends an NOTIFY containing
Event indicating value "reg,de-reg"
to the IMS_P_CSCF_B and
the IMS_S_CSCF_B receives a 200_Ok
from the IMS_P_CSCF_B entity
}
}

TP Id	TP_MW_SCSCF_INVITE_01
Test Objective	Verify that the S-CSCF successfully processes an initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.4.4.1 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_S_CSCF_A receives an INVITE containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE,
PAccessNetworkInfo,
MessageBody containing
SDP containing
Version indicating value "0"
from the IMS_P_CSCF_A entity
}
then {
the IMS_S_CSCF_A sends an INVITE containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE,
PAccessNetworkInfo,
ContentType indicating value "application/sdp",
ContentLength,
MessageBody containing
SDP containing
Version indicating value "0"
to the IMS_IBCF_A entity
}
}	

TP Id	TP_MW_SCSCF_INVITE_02
Test Objective	Verify that the S-CSCF successfully processes an initial INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.4.4.1 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_B receives an INVITE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
        from the IMS_IBCF_B entity
    }
    then {
        the IMS_S_CSCF_B sends an INVITE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            ContentType indicating value "application/sdp",
            ContentLength,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
         to the IMS_P_CSCF_B entity
    }
}
```

TP Id	TP_MW_SCSCF_INVITE_03
Test Objective	Verify that the S-CSCF successfully processes an initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.4.4.1 and 6.3
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_B receives an INVITE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
        from the IMS_P_CSCF_B entity
    }
    then {
        the IMS_S_CSCF_B sends an INVITE containing
            From indicating value PX_UE_A_SIP_URI,
```

```
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            ContentType indicating value "application/sdp",
            ContentLength,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
         to the IMS_IBCF_B entity
    }
}
```

TP Id	TP_MW_SCSCF_INVITE_04
Test Objective	Verify that the S-CSCF successfully processes an initial INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.3.2.1 and 5.3.2.1A
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_A receives an INVITE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
        from the IMS_IBCF_A entity
    }
    then {
        the IMS_S_CSCF_A sends an INVITE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            ContentType indicating value "application/sdp",
            ContentLength,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
         to the IMS_P_CSCF_A entity
    }
}
```

TP Id	TP_MW_SCSCF_100TRY_01
Test Objective	Verify that the S-CSCF successfully processes a 100 (Trying) provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.4.4.2.2 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

ensure that {
when {
the IMS_S_CSCF_A receives a 100_Trying
from the IMS_IBCF_A entity
}
then {
the IMS_S_CSCF_A sends a 100_Trying
to the IMS_P_CSCF_A entity
}
}

TP Id	TP_MW_SCSCF_100TRY_02
Test Objective	Verify that the S-CSCF successfully processes a 100 (Trying) provisional response on initial INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.4.4.2.2 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_S_CSCF_B receives a 100_Trying
from the IMS_P_CSCF_B entity
}
then {
the IMS_S_CSCF_B sends a 100_Trying
to the IMS_IBCF_B entity
}
}	

TP Id	TP_MW_SCSCF_100TRY_03
Test Objective	Verify that the S-CSCF successfully processes a 100 (Trying) provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.4.4.2.2 and 6.3
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_S_CSCF_B receives a 100_Trying
from the IMS_IBCF_B entity
}
then {
the IMS_S_CSCF_B sends a 100_Trying
to the IMS_P_CSCF_B entity
}
}	

TP Id	TP_MW_SCSCF_100TRY_04
Test Objective	Verify that the S-CSCF successfully processes a 100 (Trying) provisional response on initial INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.4.4.2.2 and 6.3
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_S_CSCF_A receives a 100_Trying
from the IMS_P_CSCF_A entity
}
then {
the IMS_S_CSCF_A sends a 100_Trying
to the IMS_IBCF_A entity
}
}	

TP Id	TP_MW_SCSCF_180RINGING_01
Test Objective	Verify that the S-CSCF successfully processes a 180 (Ringing) provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.4.4.2.2 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_S_CSCF_A receives a 180_Ringing
from the IMS_IBCF_A entity
}
then {
the IMS_S_CSCF_A sends a 180_Ringing containing
PChargingVector,
PChargingFunctionAddresses,
PPreferredIdentity
to the IMS_P_CSCF_A entity
}
}	

TP Id	TP_MW_SCSCF_180RINGING_02
Test Objective	Verify that the S-CSCF successfully processes a 180 (Ringing) provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.4.4.2.2 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour

ensure that {
when {
the IMS_S_CSCF_B receives a 180_Ringing
from the IMS_P_CSCF_B entity
}
then {
the IMS_S_CSCF_B sends a 180_Ringing containing
PChargingVector,
PChargingFunctionAddresses,
PPreferredIdentity
to the IMS_IBCF_B entity
}
}

TP Id	TP_MW_SCSCF_180RINGING_03
Test Objective	Verify that the S-CSCF successfully processes a 180 (Ringing) provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.4.4.2.2 and 6.3
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_S_CSCF_B receives a 180_Ringing
from the IMS_IBCF_B entity
}
then {
the IMS_S_CSCF_B sends a 180_Ringing
to the IMS_P_CSCF_B entity
}
}	

TP Id	TP_MW_SCSCF_180RINGING_04
Test Objective	Verify that the S-CSCF successfully processes a 180 (Ringing) provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.4.4.2.2 and 6.3
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_S_CSCF_A receives a 180_Ringing
from the IMS_P_CSCF_A entity
}
then {
the IMS_S_CSCF_A sends a 180_Ringing
to the IMS_IBCF_A entity
}
}	

TP Id	TP_MW_SCSCF_200OK_01
Test Objective	Verify that the S-CSCF successfully processes a 200 (OK) provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_A receives a 200_Ok containing
            not PChargingVector,
            not PChargingFunctionAddresses,
            not PPreferredIdentity

        from the IMS_IBCF_A entity
    }
    then {
        the IMS_S_CSCF_A sends a 200_Ok containing
            PChargingVector,
            PChargingFunctionAddresses,
            PPreferredIdentity
        to the IMS_P_CSCF_A entity
    }
}
```

TP Id	TP_MW_SCSCF_200OK_02
Test Objective	Verify that the S-CSCF successfully processes a 200 (Ok) provisional response on initial INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_B receives a 200_Ok containing
            not PChargingVector,
            not PChargingFunctionAddresses,
            not PPreferredIdentity

        from the IMS_P_CSCF_B entity
    }
    then {
        the IMS_S_CSCF_B sends a 200_Ok containing
            PChargingVector,
            PChargingFunctionAddresses,
            PPreferredIdentity
        to the IMS_IBCF_B entity
    }
}
```

TP Id	TP_MW_SCSCF_200OK_03
Test Objective	Verify that the P-CSCF successfully processes a 200 (OK) provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_B receives a 200_Ok containing
            not PChargingVector,
            not PChargingFunctionAddresses,
            not PPreferredIdentity
        from the IMS_IBCF_B entity
    }
    then {
        the IMS_S_CSCF_B sends a 200_Ok containing
            PChargingVector,
            PChargingFunctionAddresses,
            PPreferredIdentity
        to the IMS_P_CSCF_B entity
    }
}
```

TP Id	TP_MW_SCSCF_200OK_04
Test Objective	Verify that the P-CSCF successfully processes a 200 (Ok) provisional response on initial INVITE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.2
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_A receives a 200_Ok containing
            not PChargingVector,
            not PChargingFunctionAddresses,
            not PPreferredIdentity
        from the IMS_P_CSCF_A entity
    }
    then {
        the IMS_S_CSCF_A sends a 200_Ok containing
            PChargingVector,
            PChargingFunctionAddresses,
            PPreferredIdentity
        to the IMS_IBCF_A entity
    }
}
```

TP Id	TP_MW_SCSCF_ACK_01
Test Objective	Verify that the S-CSCF successfully processes a ACK provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives an ACK containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the IMS_S_CSCF_A entity
    }
    then {
        the IMS_S_CSCF_A sends an ACK containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the IMS_IBCF_A entity
    }
}
```

TP Id	TP_MW_SCSCF_ACK_02
Test Objective	Verify that the S-CSCF successfully processes a ACK provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_A receives an ACK containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the IMS_IBCF_A entity
    }
    then {
        the IMS_S_CSCF_A sends an ACK containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the IMS_P_CSCF_A entity
    }
}
```

TP Id	TP_MW_SCSCF_ACK_03
Test Objective	Verify that the P-CSCF successfully processes a ACK provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.2
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_B receives an ACK containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the IMS_P_CSCF_B entity
    }
    then {
        the IMS_S_CSCF_B sends an ACK containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the IMS_IBCF_B entity
    }
}
```

TP Id	TP_MW_SCSCF_ACK_04
Test Objective	Verify that the P-CSCF successfully processes a ACK provisional response on initial INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.2
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_A receives an ACK containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the IMS_IBCF_A entity
    }
    then {
        the IMS_S_CSCF_A sends an ACK containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the IMS_P_CSCF_A entity
    }
}
```

TP Id	TP_MW_SCSCF_RE_INVITE_01
Test Objective	Verify that the S-CSCF successfully processes an initial RE-INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A previouslyEstablishedCallWith the UE_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives an ReINVITE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
        to the IMS_S_CSCF_A entity
    }
    then {
        the IMS_S_CSCF_A receives an ReINVITE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
        from the IMS_IBCF_A entity
    }
}
```

TP Id	TP_MW_SCSCF_RE_INVITE_02
Test Objective	Verify that the S-CSCF successfully processes an initial RE-INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the IMS_P_CSCF_B previouslyEstablishedCallWith the IMS_P_CSCF_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_B receives an ReINVITE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
        to the IMS_IBCF_B entity
    }
    then {
        the IMS_S_CSCF_B receives an ReINVITE containing
            From indicating value PX_UE_A_SIP_URI,
```

```
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
        from the IMS_P_CSCF_B entity
    }
}
```

TP Id	TP_MW_SCSCF_RE_INVITE_03
Test Objective	Verify that the P-CSCF successfully processes an initial RE-INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1.1
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_A previouslyEstablishedCallWith the UE_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_B receives an ReINVITE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
        from the IMS_P_CSCF_B entity
    }
    then {
        the IMS_S_CSCF_B sends an ReINVITE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE,
            PAccessNetworkInfo,
            MessageBody containing
                SDP containing
                    Version indicating value "0"
        from the IMS_IBCF_B entity
    }
}
```

TP Id	TP_MW_SCSCF_RE_INVITE_04
Test Objective	Verify that the P-CSCF successfully processes an initial RE-INVITE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.1.1
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A and
the UE_B previouslyEstablishedCallWith the UE_A
        }
```

Expected Behaviour

ensure that {
  when {
  the IMS_S_CSCF_A receives an ReINVITE containing
  From indicating value PX_UE_A_SIP_URI,
  To indicating value PX_UE_B_SIP_URI,
  CallId indicating value PX_UE_A_CALLID,
  Via indicating value PX_UE_A_VIA,
  Route indicating value PX_UE_A_SERVICE_ROUTE,
  PAccessNetworkInfo,
  MessageBody containing
  SDP containing
  Version indicating value "0"
  to the IMS_IBCF_A entity
  }
  then {
  the IMS_S_CSCF_A receives an ReINVITE containing
  From indicating value PX_UE_A_SIP_URI,
  To indicating value PX_UE_B_SIP_URI,
  CallId indicating value PX_UE_A_CALLID,
  Via indicating value PX_UE_A_VIA,
  Route indicating value PX_UE_A_SERVICE_ROUTE,
  PAccessNetworkInfo,
  MessageBody containing
  SDP containing
  Version indicating value "0"
  from the IMS_P_CSCF_A entity
  }
}

TP Id	TP_MW_SCSCF_BYE_01
Test Objective	Verify that the S-CSCF successfully processes a BYE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.5, 5.4.5.2 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A previouslyEstablishedCallWith the UE_B
  }	

Expected Behaviour	

ensure that {
  when {
  the IMS_S_CSCF_A receives an BYE containing
  From indicating value PX_UE_A_SIP_URI,
  To indicating value PX_UE_B_SIP_URI,
  CallId indicating value PX_UE_A_CALLID,
  Via indicating value PX_UE_A_VIA,
  Route indicating value PX_UE_A_SERVICE_ROUTE
  from the IMS_P_CSCF_A entity
  }
  then {
  the IMS_S_CSCF_A sends an BYE containing
  From indicating value PX_UE_A_SIP_URI,
  To indicating value PX_UE_B_SIP_URI,
  CallId indicating value PX_UE_A_CALLID,
  Via indicating value PX_UE_A_VIA,
  Route indicating value PX_UE_A_SERVICE_ROUTE
  to the IMS_IBCF_A entity
  }
}	

TP Id	TP_MW_SCSCF_BYE_02
Test Objective	Verify that the S-CSCF successfully processes a BYE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.5, 5.4.5.2 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_B previouslyEstablishedCallWith the UE_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_S_CSCF_B receives an BYE containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE
from the IMS_P_CSCF_B entity
}
then {
the IMS_S_CSCF_B sends an BYE containing
From indicating value PX_UE_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE
to the IMS_IBCF_B entity
}
}	

TP Id	TP_MW_SCSCF_BYE_03
Test Objective	Verify that the S-CSCF successfully processes a BYE (Originating Network)
Reference	ETSI TS 124 229 [1], clauses 5.1.5, 5.4.5.1 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the IMS_P_CSCF_B previouslyEstablishedCallWith the IMS_P_CSCF_A
}	

Expected Behaviour	

ensure that {
when {
the UE_A isNoLongerAvailable
}
then {
the IMS_S_CSCF_A sends an BYE containing
From indicating value PX_S_CSCF_A_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_A_CALLID,
Via indicating value PX_UE_A_VIA,
Route indicating value PX_UE_A_SERVICE_ROUTE
to the IMS_P_CSCF_A entity
and the IMS_S_CSCF_A sends an BYE containing
From indicating value PX_S_CSCF_A_SIP_URI,
To indicating value PX_UE_B_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
to the IMS_IBCF_A entity
}
}	

TP Id	TP_MW_SCSCF_BYE_04
Test Objective	Verify that the S-CSCF successfully processes a BYE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.5, 5.4.5.2 and 6.3
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_A previouslyEstablishedCallWith the UE_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_B receives an BYE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the IMS_P_CSCF_B entity
    }
    then {
        the IMS_S_CSCF_B sends an BYE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        to the IMS_I_CSCF_B entity
    }
}
```

TP Id	TP_MW_SCSCF_BYE_05
Test Objective	Verify that the S-CSCF successfully processes a BYE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.5, 5.4.5.2 and 6.3
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A and
the UE_A previouslyEstablishedCallWith the UE_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_A receives an BYE containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE
        from the IMS_P_CSCF_A entity
    }
    then {
        the IMS_S_CSCF_A sends an BYE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        to the IMS_I_CSCF_A entity
    }
}
```

TP Id	TP_MW_SCSCF_BYE_06
Test Objective	Verify that the S-CSCF successfully processes a BYE (Originating Network)
Reference	ETSI TS 124 229 [1], clauses 5.1.5, 5.4.5.1 and 6.3
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A and
the IMS_P_CSCF_B previouslyEstablishedCallWith the IMS_P_CSCF_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the UE_B isNoLongerAvailable
    }
    then {
        the IMS_S_CSCF_A sends an BYE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        to the IMS_P_CSCF_A entity
        and the IMS_S_CSCF_A sends an BYE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        to the IMS_I_CSCF_A entity
    }
}
```

TP Id	TP_MW_SCSCF_BYE_07
Test Objective	Verify that the S-CSCF successfully processes a BYE (IMS De-registration with Active SIP Sessions)
Reference	ETSI TS 124 229 [1], clauses 5.1.5, 5.4.5.1 and 6.3
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the IMS_P_CSCF_B previouslyEstablishedCallWith the IMS_P_CSCF_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the UE_B isNoLongerAvailable
    }
    then {
        the IMS_S_CSCF_A sends a BYE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        to the IMS_P_CSCF_A entity
        and the IMS_S_CSCF_A sends a BYE containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        to the IMS_I_CSCF_A entity
    }
}
```

TP Id	TP_MW_SCSCF_200OK_BYE_01
Test Objective	Verify that the S-CSCF successfully processes a 200 (OK) BYE (Originating Leg/Originating Network)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_A receives a 200_Ok containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE
        from the IMS_IBCF_A entity
    }
    then {
        the IMS_S_CSCF_A sends a 200_Ok containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE
        to the IMS_P_CSCF_A entity
    }
}
```

TP Id	TP_MW_SCSCF_200OK_BYE_02
Test Objective	Verify that the S-CSCF successfully processes a 200 (OK) BYE (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_B receives a 200_Ok containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the IMS_IBCF_B entity
    }
    then {
        the IMS_S_CSCF_B sends a 200_Ok containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        to the IMS_P_CSCF_B entity
    }
}
```

TP Id	TP_MW_SCSCF_200OK_BYE_04
Test Objective	Verify that the S-CSCF successfully processes a 200 (OK) BYE (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.3
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_B receives a 200_Ok containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE
        from the IMS_IBCF_B entity
    }
    then {
        the IMS_S_CSCF_B sends a 200_Ok containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE
        to the IMS_P_CSCF_B entity
    }
}
```

TP Id	TP_MW_SCSCF_200OK_BYE_05
Test Objective	Verify that the S-CSCF successfully processes a 200 (OK) BYE (Terminating Leg/Originating Network)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.3
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_A receives a 200_Ok containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the IMS_IBCF_A entity
    }
    then {
        the IMS_S_CSCF_A sends a 200_Ok containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        to the IMS_P_CSCF_A entity
    }
}
```

TP Id	TP_MW_SCSCF_CANCEL_01
Test Objective	Verify that the S-CSCF successfully processes a CANCEL (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the IMS_P_CSCF_A hasAchievedInitialINVITE and
the UE_A isRequestedToSend a CANCEL
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_A receives an CANCEL containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the IMS_P_CSCF_A entity
    }
    then {
        the IMS_S_CSCF_A sends an CANCEL containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        to the IMS_IBCF_A entity
    }
}
```

TP Id	TP_MW_SCSCF_CANCEL_02
Test Objective	Verify that the S-CSCF successfully processes a CANCEL (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the IMS_P_CSCF_B hasAchievedInitialINVITE and
the UE_A isRequestedToSend a CANCEL
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_B receives an CANCEL containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the IMS_IBCF_B entity
    }
    then {
        the IMS_S_CSCF_B sends an CANCEL containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        to the IMS_P_CSCF_B entity
    }
}
```

TP Id	TP_MW_SCSCF_CANCEL_03
Test Objective	Verify that the S-CSCF successfully processes a CANCEL (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.1.3 and 6.3
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_A hasAchievedInitialINVITE and
the UE_A isRequestedToSend a CANCEL
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_B receives an CANCEL containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the IMS_P_CSCF_B entity
    }
    then {
        the IMS_S_CSCF_B sends an CANCEL containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        to the IMS_IBCF_B entity
    }
}
```

TP Id	TP_MW_SCSCF_CANCEL_04
Test Objective	Verify that the S-CSCF successfully processes a CANCEL (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.3
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A and
the UE_B hasAchievedInitialINVITE and
the UE_A isRequestedToSend a CANCEL
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_A receives an CANCEL containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        from the IMS_IBCF_A entity
    }
    then {
        the IMS_S_CSCF_A sends an CANCEL containing
            From indicating value PX_UE_A_SIP_URI,
            To indicating value PX_UE_B_SIP_URI,
            CallId indicating value PX_UE_A_CALLID,
            Via indicating value PX_UE_A_VIA,
            Route indicating value PX_UE_A_SERVICE_ROUTE
        to the IMS_P_CSCF_A entity
    }
}
```

TP Id	TP_MW_SCSCF_486INVITE_01
Test Objective	Verify that the S-CSCF successfully processes a 486 INVITE (busy) to reject call (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_B isBusy
}	

Expected Behaviour	

ensure that {
when {
the IMS_S_CSCF_A receives a 486_INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
from the IMS_IBCF_A entity
}
then {
the IMS_S_CSCF_A sends a 486_INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
to the IMS_P_CSCF_A entity
}
}	

TP Id	TP_MW_SCSCF_486INVITE_02
Test Objective	Verify that the S-CSCF successfully processes a 486 INVITE (busy) to reject call (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_B isBusy
}	

Expected Behaviour	

ensure that {
when {
the IMS_S_CSCF_B receives a 486_INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
from the IMS_P_CSCF_B entity
}
then {
the IMS_S_CSCF_B sends a 486_INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
to the IMS_IBCF_B entity
}
}	

TP Id	TP_MW_SCSCF_486INVITE_03
Test Objective	Verify that the S-CSCF successfully processes a 486 INVITE (busy) to reject call (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.3
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_B isBusy
}	

Expected Behaviour	

ensure that {
when {
the IMS_S_CSCF_B receives a 486_INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
from the IMS_IBCF_B entity
}
then {
the IMS_S_CSCF_B sends a 486_INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
to the IMS_P_CSCF_B entity
}
}	

TP Id	TP_MW_SCSCF_486INVITE_04
Test Objective	Verify that the S-CSCF successfully processes a 486 INVITE (busy) to reject call (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.3
Configuration	CF_VxLTE_RMI_A
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_A and
the UE_A isBusy
}	

Expected Behaviour	

ensure that {
when {
the IMS_S_CSCF_A receives a 486_INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
from the IMS_P_CSCF_A entity
}
then {
the IMS_S_CSCF_A sends a 486_INVITE containing
From indicating value PX_UE_B_SIP_URI,
To indicating value PX_UE_A_SIP_URI,
CallId indicating value PX_UE_B_CALLID,
Via indicating value PX_UE_B_VIA,
Route indicating value PX_UE_B_SERVICE_ROUTE
to the IMS_IBCF_A entity
}
}	

TP Id	TP_MW_SCSCF_487INVITE_01
Test Objective	Verify that the S-CSCF successfully processes a 487 INVITE (Request Terminated) to reject call (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A isRequestedToSend a CANCEL
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_A receives a 487_INVITE containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE
        from the IMS_IBCF_A entity
    }
    then {
        the IMS_S_CSCF_A sends a 487_INVITE containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE
        to the IMS_P_CSCF_A entity
    }
}
```

TP Id	TP_MW_SCSCF_487INVITE_02
Test Objective	Verify that the S-CSCF successfully processes a 487 INVITE (Request Terminated) to reject call (Terminating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.3
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A and
the UE_B isRegisteredTo the IMS_B and
the UE_A isRequestedToSend a CANCEL
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_B receives a 487_INVITE containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE
        from the IMS_P_CSCF_B entity
    }
    then {
        the IMS_S_CSCF_B sends a 487_INVITE containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE
        to the IMS_IBCF_B entity
    }
}
```

TP Id	TP_MW_SCSCF_487INVITE_03
Test Objective	Verify that the S-CSCF successfully processes a 487 INVITE (Request Terminated) to reject call (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.3
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_A isRequestedToSend a CANCEL
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_B receives a 487_INVITE containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE
        from the IMS_IBCF_B entity
    }
    then {
        the IMS_S_CSCF_B sends a 487_INVITE containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE
        to the IMS_P_CSCF_B entity
    }
}
```

TP Id	TP_MW_SCSCF_487INVITE_04
Test Objective	Verify that the S-CSCF successfully processes a 487 INVITE (Request Terminated) to reject call (Originating Leg)
Reference	ETSI TS 124 229 [1], clauses 5.2.7 and 6.3
Configuration	CF_VxLTE_RMI_B
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_B isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_B and
the UE_B isRegisteredTo the IMS_B and
the UE_A isRequestedToSend a CANCEL
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_A receives a 487_INVITE containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE
        from the IMS_P_CSCF_A entity
    }
    then {
        the IMS_S_CSCF_A sends a 487_INVITE containing
            From indicating value PX_UE_B_SIP_URI,
            To indicating value PX_UE_A_SIP_URI,
            CallId indicating value PX_UE_B_CALLID,
            Via indicating value PX_UE_B_VIA,
            Route indicating value PX_UE_B_SERVICE_ROUTE
        to the IMS_IBCF_A entity
    }
}
```

7.6 Rx interface

TP Id	TP_RX_PCRF_AAA_01
Test Objective	Verify that IUT after AA-Request is received due to provisioning of AF Signalling flow sends AA-Answer
Reference	ETSI TS 129 214 [7], clauses 4.4.5a, A.8 and annex B
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isNotAttachedTo the EPC_A and
the UE_A isNotRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_A sends an AAR
to the EPC_PCRF_A entity
}
then {
the EPC_PCRF_A sends the AAA containing
Result_Code_AVP
indicating value DIAMETER_SUCCESS
to the IMS_P_CSCF_A entity
}
}	

TP Id	TP_RX_PCRF_AAA_02
Test Objective	Verify that IUT sends AA-Answer after RAA is received from PGW
Reference	ETSI TS 129 214 [7], clause A.8
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the EPC_PGW_A sends a RAA
to the EPC_PCRF_A entity
}
then {
the EPC_PCRF_A sends the AAA containing
Result_Code_AVP
indicating value DIAMETER_SUCCESS "2001"
to the IMS_P_CSCF_A entity
}
}	

TP Id	TP_RX_PCRF_AAA_03
Test Objective	Verify that IUT receives AA-Answer from home PCRF and it sends AA-Answer towards visited P-CSCF
Reference	ETSI TS 129 214 [7], clauses 4.4.5a, A.8 and annex B
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the EPC_PCRF_A sends a AAA
to the EPC_PCRF_B entity
}
then {
the EPC_PCRF_B sends the AAA	

```
        to the IMS_P_CSCF_B entity
    }
}
```

TP Id	TP_RX_PCSCF_AAR_01
Test Objective	Verify that IUT after 2XX_Response on REGISTER sends an AA-Request due to provisioning of AF Signalling flow
Reference	ETSI TS 129 214 [7], clauses 4.4.5a, A.8 and annex B
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
            the UE_A isNotAttachedTo the EPC_A and
            the UE_A isNotRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_S_CSCF_A sends a 200_Response_REGISTER
        to the IMS_P_CSCF_A entity
    }
    then {
        the IMS_P_CSCF_A sends an AAR containing
            Framed_IPv4_Address_AVP
                indicating value "IPv4_Address of UE_A",
            "or" Framed_IPv6_Address_AVP
                indicating value "IPv6_Address of UE_A",
            Specific_Action_AVP
                indicating value INDICATION_OF_LOSS_OF_BEARER,
            "one or more" Media_Component_Description_AVP containing
                Media_Component_Number_AVP
                    indicating value 0,
                Media_Sub_Component_AVP containing
                    Flow_Description_AVP
                    Flow_Usage_AVP
                        indicating value AF_SIGNALLING,
                    Flow_Status_AVP
                        indicating value ENABLED,
                    AF_Signalling_Protocol_AVP
                        indicating value SIP
        to the EPC_PCRF_A entity
    }
}
```

TP Id	TP_RX_PCSCF_AAR_02
Test Objective	IUT does not send AA-Request if 4XX_Response REGISTER is received
Reference	ETSI TS 129 214 [7], clause A.8
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isNotRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives an 4XX_Response_REGISTER
        from the IMS_S_CSCF_A entity
    }
    then {
        the IMS_P_CSCF_A not sends the AAR
        to the EPC_PCRF_A entity
    }
}
```

TP Id	TP_RX_PCSCF_AAR_03
Test Objective	Verify that IUT send AA-Request in case of session establishment for originating side after INVITE is received
Reference	ETSI TS 129 214 [7], clauses 4.4.1, A.1, A.2 and annex B
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives an INVITE_Request_with_SDP_offer
        from the UE_A entity
    }
    then {
        the IMS_P_CSCF_A sends the AAR containing
            Framed_IPv4_Address_AVP
                indicating value "IPv4_Address of UE_A",
            "or" Framed_IPv6_Address_AVP
                indicating value "IPv6_Address of UE_A",
            "one or more" Media_Component_Description_AVP
            Rx_Request_Type_AVP
                indicating value INITIAL_REQUEST '0',
            Service_Info_Status_AVP
                indicating value PRELIMINARY_SERVICE_INFORMATION '1'

        to the EPC_PCRF_A entity
    }
}
```

TP Id	TP_RX_PCSCF_AAR_04
Test Objective	Verify that IUT send AA-Request in case of session establishment for originating side after 183 response with SDP is received
Reference	ETSI TS 129 214 [7], clauses 4.4.1, A.1, A.2 and annex B
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives a 183_Response_INVITE_with_SDP_offer
        from the IMS_S_CSCF_A entity
    }
    then {
        the IMS_P_CSCF_A sends the AAR containing
            Framed_IPv4_Address_AVP
                indicating value "IPv4_Address of UE_A",
            "or" Framed_IPv6_Address_AVP
                indicating value "IPv6_Address of UE_A",
            "one or more" Media_Component_Description_AVP
            Rx_Request_Type_AVP
                indicating value UPDATE_REQUEST '1',
            Service_Info_Status_AVP
                indicating value FINAL_SERVICE_INFORMATION '1'

        to the EPC_PCRF_A entity
    }
}
```

TP Id	TP_RX_PCSCF_AAR_05
Test Objective	Verify that IUT send AA-Request in case of session modification for originating side after reINVITE with SDP is received
Reference	ETSI TS 129 214 [7], clauses 4.4.1, A.1, A.2 and annex B
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives a reINVITE_with_SDP_offer
        from the IMS_S_CSCF_A entity
    }
    then {
        the IMS_P_CSCF_A sends the AAR containing
            Framed_IPv4_Address_AVP
                indicating value "IPv4_Address of UE_A",
            "or" Framed_IPv6_Address_AVP
                indicating value "IPv6_Address of UE_A",
            "one or more" Media_Component_Description_AVP
            Rx_Request_Type_AVP
                indicating value UPDATE_REQUEST '1',
            Service_Info_Status_AVP
                indicating value PRELIMINARY_SERVICE_INFORMATION '1'

        to the EPC_PCRF_A entity
    }
}
```

TP Id	TP_RX_PCSCF_AAR_06
Test Objective	Verify that IUT send AA-Request in case of session establishment for terminating side after INVITE is received
Reference	ETSI TS 129 214 [7], clauses 4.4.1, A.1, A.2 and annex B
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives an INVITE_Request_with_SDP_offer
        from the IMS_S_CSCF_A entity
    }
    then {
        the IMS_P_CSCF_A sends the AAR containing
            Framed_IPv4_Address_AVP
                indicating value "IPv4_Address of UE_A",
            "or" Framed_IPv6_Address_AVP
                indicating value "IPv6_Address of UE_A",
            "one or more" Media_Component_Description_AVP
            Rx_Request_Type_AVP
                indicating value INITIAL_REQUEST '0',
            Service_Info_Status_AVP
                indicating value PRELIMINARY_SERVICE_INFORMATION '1'

        to the EPC_PCRF_A entity
    }
}
```

TP Id	TP_RX_PCSCF_AAR_07
Test Objective	Verify that IUT send AA-Request in case of session establishment for terminating side after 183 response with SDP is received
Reference	ETSI TS 129 214 [7], clauses 4.4.1, A.1, A.2 and annex B
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives a 183_Response_INVITE_with_SDP_offer
        from the UE_B entity
    }
    then {
        the IMS_P_CSCF_A sends the AAR containing
            Framed_IPv4_Address_AVP
                indicating value "IPv4_Address of UE_A",
            "or" Framed_IPv6_Address_AVP
                indicating value "IPv6_Address of UE_A",
            "one or more" Media_Component_Description_AVP
            Rx_Request_Type_AVP
                indicating value UPDATE_REQUEST '1',
            Service_Info_Status_AVP
                indicating value FINAL_SERVICE_INFORMATION '1'

        to the EPC_PCRF_A entity
    }
}
```

TP Id	TP_RX_PCSCF_AAR_08
Test Objective	Verify that IUT send AA-Request in case of session modification for terminating side after reINVITE with SDP is received
Reference	ETSI TS 129 214 [7], clauses 4.4.1, A.1, A.2 and annex B
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives a reINVITE_with_SDP_offer
        from the UE_B entity
    }
    then {
        the IMS_P_CSCF_A sends the AAR containing
            Framed_IPv4_Address_AVP
                indicating value "IPv4_Address of UE_A",
            "or" Framed_IPv6_Address_AVP
                indicating value "IPv6_Address of UE_A",
            "one or more" Media_Component_Description_AVP
            Rx_Request_Type_AVP
                indicating value UPDATE_REQUEST '1',
            Service_Info_Status_AVP
                indicating value PRELIMINARY_SERVICE_INFORMATION '1'

        to the EPC_PCRF_A entity
    }
}
```

TP Id	TP_RX_PCSCF_AAR_09
Test Objective	Verify that IUT send AA-Request in case of session modification for originating side after 200 OK on re-INVITE is received
Reference	ETSI TS 129 214 [7], clauses 4.4.2, A.1, A.2 and annex B
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives a 200_Response_INVITE_with_SDP_offer
        from the IMS_S_CSCF_A entity
    }
    then {
        the IMS_P_CSCF_A sends the AAR containing
            Framed_IPv4_Address_AVP
                indicating value "IPv4_Address of UE_A",
            "or" Framed_IPv6_Address_AVP
                indicating value "IPv6_Address of UE_A",
            "one or more" Media_Component_Description_AVP
            Rx_Request_Type_AVP
                indicating value UPDATE_REQUEST '1',
            Service_Info_Status_AVP
                indicating value FINAL_SERVICE_INFORMATION '1'

        to the EPC_PCRF_A entity
    }
}
```

TP Id	TP_RX_PCSCF_AAR_10
Test Objective	Verify that IUT send AA-Request in case of session modification for terminating side after 200 OK on re-INVITE is received
Reference	ETSI TS 129 214 [7], clauses 4.4.2, A.1, A.2 and annex B
Configuration	CF_VxLTE_INT
PICS Selection	NONE

Initial Conditions

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A receives a 200_Response_INVITE_with_SDP_offer
        from the UE_B entity
    }
    then {
        the IMS_P_CSCF_A sends the AAR containing
            Framed_IPv4_Address_AVP
                indicating value "IPv4_Address of UE_A",
            "or" Framed_IPv6_Address_AVP
                indicating value "IPv6_Address of UE_A",
            "one or more" Media_Component_Description_AVP
            Rx_Request_Type_AVP
                indicating value UPDATE_REQUEST '1',
            Service_Info_Status_AVP
                indicating value FINAL_SERVICE_INFORMATION '1'

        to the EPC_PCRF_A entity
    }
}
```

TP Id	TP_RX_PCRF_ASA_01
Test Objective	Verify that IUT sends AA-Answer after RAA is received from PGW
Reference	ETSI TS 129 214 [7], clause 4.4.6.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_A sends a ASR containing
Abort_Cause_AVP
indicating value BEARER_RELEASED '0'
to the EPC_PCRF_A entity
}
then {
the EPC_PCRF_A sends the ASA containing
Result_Code_AVP
indicating value DIAMETER_SUCCESS "2001"
to the IMS_P_CSCF_A entity
}
}	

TP Id	TP_RX_PCSCF_ASR_01
Test Objective	Verify that IUT receives AS-Request from home PCRF and it sends AS-Request towards visited P-CSCF
Reference	ETSI TS 129 214 [7], clause 4.4.6.1
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the EPC_PCRF_A sends a ASR
to the EPC_PCRF_B entity
}
then {
the EPC_PCRF_B sends the ASR containing
Session_Id_AVP
Abort_Cause_AVP
indicating value BEARER_RELEASED
to the IMS_P_CSCF_B entity
}
}	

TP Id	TP_RX_PCSCF_RAA_01
Test Objective	Verify that IUT sends RA-Answer after RAR is received from PCRF
Reference	ETSI TS 129 214 [7], clauses 4.4.6.2 and 5.3.13
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the EPC_PCRF_A sends a RAR containing
Specific_Action_AVP
indicating value INDICATION_OF_SUCCESSFUL_RESOURCES_ALLOCATION '8'
to the IMS_P_CSCF_A entity
}
then {	

```
        the IMS_P_CSCF_A sends the RAA containing
            Result_Code_AVP
                indicating value DIAMETER_SUCCESS "2001"
        to the EPC_PCRF_A entity
    }
}
```

TP Id	TP_RX_PCRF_STA_01
Test Objective	Verify that IUT after reception of RA-Request sends ST-Answer
Reference	ETSI TS 129 214 [7], clause 4.4.4
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
            the UE_A isNotAttachedTo the EPC_A and
            the UE_A isNotRegisteredTo the IMS_A and
            the UE_A previouslyEstablishedCallWith the UE_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the EPC_PGW_A sends an RAA
        to the EPC_PCRF_A entity
    }
    then {
        the EPC_PCRF_A sends the STA containing
            Result_Code_AVP
                indicating value DIAMETER_SUCCESS
        to the IMS_P_CSCF_A entity
    }
}
```

TP Id	TP_RX_PCRF_STA_02
Test Objective	Verify that IUT after reception of ST-Request sends ST-Answer
Reference	ETSI TS 129 214 [7], clauses 4.4.4, 4.4.5 and A.8
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
            the UE_A isNotAttachedTo the EPC_A and
            the UE_A isNotRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A sends an STR
        to the EPC_PCRF_A entity
    }
    then {
        the EPC_PCRF_A sends the STA containing
            Result_Code_AVP
                indicating value DIAMETER_SUCCESS
        to the IMS_P_CSCF_A entity
    }
}
```

TP Id	TP_RX_PCSCF_STR_01
Test Objective	Verify that IUT after reception of BYE sends an ST-Request at originating leg
Reference	ETSI TS 129 214 [7], clause 4.4.4
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_A previouslyEstablishedCallWith the UE_B
        }
```

Expected Behaviour

ensure that {
when {
the IMS_P_CSCF_A receives a BYE
from the UE_A entity
}
then {
the IMS_P_CSCF_A sends the STR containing
Session_Id_AVP
to the EPC_PCRF_A entity
}
}

TP Id	TP_RX_PCSCF_STR_02
Test Objective	Verify that IUT after reception of BYE sends an ST-Request at terminating leg
Reference	ETSI TS 129 214 [7], clause 4.4.4
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_B isAttachedTo the EPC_B and
the UE_B isRegisteredTo the IMS_B and
the UE_B previouslyEstablishedCallWith the UE_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_B receives a BYE
from the IMS_S_CSCF_B entity
}
then {
the IMS_P_CSCF_B sends the STR containing
Session_Id_AVP
to the EPC_PCRF_B entity
}
}	

TP Id	TP_RX_PCSCF_STR_03
Test Objective	Verify that IUT after reception of CANCEL sends an ST-Request at originating leg
Reference	ETSI TS 129 214 [7], clause 4.4.4
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_A receives a CANCEL
from the UE_A entity
}
then {
the IMS_P_CSCF_A sends the STR containing
Session_Id_AVP
to the EPC_PCRF_A entity
}
}	

TP Id	TP_RX_PCSCF_STR_04
Test Objective	Verify that IUT after reception of CANCEL sends an ST-Request at terminating leg
Reference	ETSI TS 129 214 [7], clause 4.4.4
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_B isAttachedTo the EPC_B and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour

ensure that {
when {
the IMS_P_CSCF_B receives a CANCEL
from the IMS_S_CSCF_B entity
}
then {
the IMS_P_CSCF_B sends the STR containing
Session_Id_AVP
to the EPC_PCRF_B entity
}
}

TP Id	TP_RX_PCSCF_STR_05
Test Objective	Verify that IUT after reception of 486 response sends an ST-Request at originating leg
Reference	ETSI TS 129 214 [7], clause 4.4.4
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_A receives a 486_Response_INVITE
from the IMS_S_CSCF_A entity
}
then {
the IMS_P_CSCF_A sends the STR containing
Session_Id_AVP
to the EPC_PCRF_A entity
}
}	

TP Id	TP_RX_PCSCF_STR_06
Test Objective	Verify that IUT after reception of 486 response sends an ST-Request at terminating leg
Reference	ETSI TS 129 214 [7], clause 4.4.4
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_B isAttachedTo the EPC_B and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_B receives a 486_Response_INVITE
from the IMS_S_CSCF_B entity
}
then {
the IMS_P_CSCF_B sends the STR containing
Session_Id_AVP
to the EPC_PCRF_B entity
}
}	

TP Id	TP_RX_PCSCF_STR_07
Test Objective	Verify that IUT after reception of 200 response REGISTER sends an ST-Request
Reference	ETSI TS 129 214 [7], clauses 4.4.4, 4.4.5a and A.8
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour

ensure that {
when {
the IMS_P_CSCF_A receives a 200_Response_REGISTER
from the IMS_S_CSCF_A entity
}
then {
the IMS_P_CSCF_A sends the STR containing
Session_Id_AVP
to the EPC_PCRF_A entity
}
}

TP Id	TP_RX_PCSCF_STR_08
Test Objective	Verify that IUT after reception of NOTIFY during administrative de-registration sends an ST-Request
Reference	ETSI TS 129 214 [7], clauses 4.4.4, 4.4.5a and A.8
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_A receives a NOTIFY
from the IMS_S_CSCF_A entity
}
then {
the IMS_P_CSCF_A sends the STR containing
Session_Id_AVP
to the EPC_PCRF_A entity
}
}	

7.7 Gx interface

TP Id	TP_GX_PCRF_CCA_01
Test Objective	Verify that IUT when receives CC-Request for PCC Rules sends a CC-Answer in case of attachment procedure
Reference	ETSI TS 129 212 [8], clauses 4.5.1 (item 1) and 4a.5.1 (item 1)
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isNotAttachedTo the EPC_A and
the UE_A isNotRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the EPC_PGW_A sends an CCR containing
CC_Request_Type_AVP
indicating value INITIAL_REQUEST
Subscription_Id_AVP containing
Subscription_Id_Type_AVP
indicating value END_USER_IMSI,
IP_CAN_Type_AVP
RAT_Type_AVP
Called_Station_Id_AVP
Framed_IP_Address_AVP
"or" Framed_IP6_IP_Address_AVP
QoS_Information_AVP
Default_EPS_Bearer_QoS_AVP containing
QoS_Class_Identifier_AVP
indicating value '5'
Allocation_Retention_Priority_AVP containing
Priority_Level_AVP	

```
                    Pre_emption_Capablity_AVP
                    Pre_emption_Vulnerability_AVP
        to the EPC_PCRF_A entity
    }
    then {
        the EPC_PCRF_A sends the CCA containing
            Result_Code_AVP
                indicating value DIAMETER_SUCCESS
        to the EPC_PGW_A entity
    }
}
```

TP Id	TP_GX_PCRF_CCA_02
Test Objective	Verify that IUT when receives CC-Request for PCC Rules sends a CC-Answer in case of detachment procedure
Reference	ETSI TS 129 212 [8], clauses 4.5.1 (item 1) and 4a.5.1 (item 1)
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isNotAttachedTo the EPC_A and
the UE_A isNotRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the EPC_PGW_A sends an CCR containing
CC_Request_Type_AVP
indicating value TERMINATION_REQUEST
to the EPC_PCRF_A entity
}
then {
the EPC_PCRF_A sends the CCA containing
Result_Code_AVP
indicating value DIAMETER_SUCCESS
to the EPC_PGW_A entity
}
}	

TP Id	TP_GX_PCRF_CCA_03
Test Objective	Verify that IUT when receives CC-Request for session release sends a CC-Answer in case of detachment procedure
Reference	ETSI TS 129 212 [8], clause 4.5.7
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isNotRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the EPC_PGW_A sends an CCR containing
CC_Request_Type_AVP
indicating value TERMINATION_REQUEST
to the EPC_PCRF_A entity
}
then {
the EPC_PCRF_A sends the CCA containing
Result_Code_AVP
indicating value DIAMETER_SUCCESS
to the EPC_PGW_A entity
}
}	

TP Id	TP_GX_PCRF_CCA_04
Test Objective	Verify that IUT receives CC-Answer from home PCRF and it sends CC-Answer towards home P-GW
Reference	ETSI TS 129 212 [8], clauses 4.5.1 (item 1) and 4a.5.1 (item 1)
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

```
with {
            the UE_A isNotAttachedTo the EPC_B and
            the UE_A isNotRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the EPC_PCRF_A sends an CCA
        to the EPC_PCRF_B entity
    }
    then {
        the EPC_PCRF_B sends the CCA containing
            Result_Code_AVP
                indicating value DIAMETER_SUCCESS
            QoS_Information_AVP containing
                APN_Aggregate_Max_Requested_Bandwidth_UL_AVP
                APN_Aggregate_Max_Requested_Bandwidth_DL_AVP
                Bearer_Identifier_AVP,
            Default_EPS_Bearer_QoS_AVP containing
                QoS_Class_Identifier_AVP
                    indicating value '5'
                Allocation_Retention_Priority_AVP containing
                    Priority_Level_AVP
                    Pre_emption_Capablity_AVP
                    Pre_emption_Vulnerability_AVP
        to the EPC_PGW_B entity
    }
}
```

TP Id	TP_GX_PCRF_CCA_05
Test Objective	Verify that IUT receives CC-Answer from home PCRF and it sends CC-Answer towards home P-GW
Reference	ETSI TS 129 212 [8], clause 4.5.7
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

```
with {
            the UE_A isAttachedTo the EPC_B and
            the UE_A isNotRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the EPC_PCRF_A sends an CCA
        to the EPC_PCRF_B entity
    }
    then {
        the EPC_PCRF_B sends the CCA containing
            Result_Code_AVP
                indicating value DIAMETER_SUCCESS
        to the EPC_PGW_B entity
    }
}
```

TP Id	TP_GX_PCRF_CCA_06
Test Objective	Verify that IUT when receives CC-Request for session update sends a CC-Answer in case of bearer control mode selection
Reference	ETSI TS 129 212 [8], clause 4.5.10
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
            the UE_A isAttachedTo the EPC_A and
            the UE_A isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the EPC_PGW_A sends an CCR containing
            CC_Request_Type_AVP
                indicating value UPDATE_REQUEST
        to the EPC_PCRF_A entity
    }
    then {
        the EPC_PCRF_A sends the CCA containing
            Result_Code_AVP
                indicating value DIAMETER_SUCCESS
        to the EPC_PGW_A entity
    }
}
```

TP Id	TP_GX_PGW_CCR_01
Test Objective	Verify that when IUT is invoked with a create session request the CC-Request is sent towards PCRF
Reference	ETSI TS 129 212 [8], clauses 4.5.1 (item 1) and 4a.5.1 (item 1)
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

```
with {
            the UE_A isNotAttachedTo the EPC_B and
            the UE_A isNotRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the EPC_PGW_A invokes create_session_request
    }
    then {
        the EPC_PGW_B sends an CCR containing
            CC_Request_Type_AVP
                indicating value INITIAL_REQUEST
            Subscription_Id_AVP containing
                Subscription_Id_Type_AVP
                    indicating value END_USER_IMSI,
            IP_CAN_Type_AVP
            RAT_Type_AVP
            Called_Station_Id_AVP
            Framed_IP_Address_AVP
            "or" Framed_IP6_IP_Address_AVP
            QoS_Information_AVP
            Default_EPS_Bearer_QoS_AVP containing
                QoS_Class_Identifier_AVP
                    indicating value '5'
                Allocation_Retention_Priority_AVP containing
                    Priority_Level_AVP
                    Pre_emption_Capablity_AVP
                    Pre_emption_Vulnerability_AVP
        to the EPC_PCRF_B entity
    }
}
```

TP Id	TP_GX_PGW_CCR_02
Test Objective	Verify that when IUT is invoked with a delete session request the CC-Request is sent towards PCRF
Reference	ETSI TS 129 212 [8], clause 4.5.7
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_A isNotRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the EPC_PGW_A invokes delete_session_request
}
then {
the EPC_PGW_B sends an CCR containing
CC_Request_Type_AVP
indicating value TERMINATION_REQUEST
to the EPC_PCRF_B entity
}
}	

TP Id	TP_GX_PGW_RAA_01
Test Objective	IUT successfully processes all mandatory AVPs in an RA-Request received due provision of PCC rules and sends RA-Answer
Reference	ETSI TS 129 212 [8], clause 4.5.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isNotRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the EPC_PCRF_A sends an RAR containing
Charging_Rule_Install_AVP containing
Charging_Rule_Definition_AVP containing
Charging_Rule_Name_AVP
Flows_AVP containing
Media_Component_Number_AVP
indicating value 0,
Flow_Status_AVP
indicating value ENABLED
to the EPC_PGW_A entity
}
then {
the EPC_PGW_A sends the RAA containing
Result_Code_AVP
indicating value DIAMETER_SUCCESS
to the EPC_PCRF_A entity
}
}	

TP Id	TP_GX_PGW_RAA_02
Test Objective	IUT successfully processes an RA-Request received due to the Session Bearer procedure and sends RA-Answer with Result_Code_AVP.
Reference	ETSI TS 129 212 [8], clause 4.5.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour

ensure that {
  when {
  the EPC_PCRF_A sends an RAR
  to the EPC_PGW_A entity
  }
  then {
  the EPC_PGW_A sends the RAA containing
  Result_Code_AVP
  indicating value DIAMETER_SUCCESS
  to the EPC_PCRF_A entity
  }
}

TP Id	TP_GX_PGW_RAA_03
Test Objective	IUT successfully processes an RA-Request received due to the Session Bearer procedure and sends RA-Answer with Result_Code_AVP
Reference	ETSI TS 129 212 [8], clause 4.5.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_A previouslyEstablishedCallWith the UE_B
  }	

Expected Behaviour	

ensure that {
  when {
  the EPC_PCRF_A sends an RAR
  to the EPC_PGW_A entity
  }
  then {
  the EPC_PGW_A sends the RAA containing
  Result_Code_AVP
  indicating value DIAMETER_SUCCESS
  to the EPC_PCRF_A entity
  }
}	

TP Id	TP_GX_PGW_RAA_04
Test Objective	IUT successfully processes an RA-Request received due to removal of Session Bearer procedure and sends RA-Answer with Result_Code_AVP
Reference	ETSI TS 129 212 [8], clause 4.5.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
  }	

Expected Behaviour	

ensure that {
  when {
  the EPC_PCRF_A sends an RAR containing
  Charging_Rule_Remove_AVP containing
  Charging_Rule_Name_AVP
  to the EPC_PGW_A entity
  }
  then {
  the EPC_PGW_A sends the RAA containing
  Result_Code_AVP
  indicating value DIAMETER_SUCCESS
  to the EPC_PCRF_A entity
  }
}	

TP Id	TP_GX_PCRF_RAR_01
Test Objective	When IUT receives AA-Request from P-CSCF successfully sends an RA-Request due to the Session Bearer procedure
Reference	ETSI TS 129 212 [8], clause 4.5.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A sends an AAR
        to the EPC_PCRF_A entity
    }
    then {
        the EPC_PCRF_A sends the RAR containing
            Charging_Rule_Install_AVP containing
                Charging_Rule_Definition_AVP containing
                    Charging_Rule_Name_AVP
                    Flow_Information_AVP containing
                        Flow_Description_AVP
                    Flow_Status_AVP
                    Flows_AVP containing
                        Media_Component_Number_AVP,
                    QOS_Information_AVP containing
                        QOS_Class_Identifier_AVP
                            indicating value
                                "QCI_1 for voice or
                                 QCI_2 for video",
                        Max_Requested_Bandwidth_UL_AVP
                        Max_Requested_Bandwidth_DL_AVP
                        Guaranteed_Bitrate_UL_AVP
                        Guaranteed_Bitrate_DL_AVP
                        Allocation_Retention_Priority_AVP
        to the EPC_PGW_A entity
    }
}
```

TP Id	TP_GX_PCRF_RAR_02
Test Objective	When IUT receives ST-Request from P-CSCF to remove all relevant previously created bearers then IUT sends an RA-Request
Reference	ETSI TS 129 212 [8], clause 4.5.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_A previouslyEstablishedCallWith the UE_B
        }
```

Expected Behaviour

```
ensure that {
    when {
        the IMS_P_CSCF_A sends an STR
        to the EPC_PCRF_A entity
    }
    then {
        the EPC_PCRF_A sends the RAR containing
            Charging_Rule_Remove_AVP containing
                Charging_Rule_Name_AVP
        to the EPC_PGW_A entity
    }
}
```

TP Id	TP_GX_PCRF_RAR_03
Test Objective	When IUT receives AA-Answer from home PCRF then IUT sends an RA-Request due to the Session Bearer procedure
Reference	ETSI TS 129 212 [8], clause 4.5.2
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the EPC_PCRF_A sends an AAA
        to the EPC_PCRF_B entity
    }
    then {
        the EPC_PCRF_B sends the RAR containing
            Charging_Rule_Install_AVP containing
                Charging_Rule_Definition_AVP containing
                    Charging_Rule_Name_AVP
                    Flow_Information_AVP containing
                        Flow_Description_AVP
                    Flow_Status_AVP
                    Flows_AVP containing
                        Media_Component_Number_AVP,
                    QOS_Information_AVP containing
                        QOS_Class_Identifier_AVP
                            indicating value
                                "QCI_1 for voice or
                                 QCI_2 for video",
                        Max_Requested_Bandwidth_UL_AVP
                        Max_Requested_Bandwidth_DL_AVP
                        Guaranteed_Bitrate_UL_AVP
                        Guaranteed_Bitrate_DL_AVP
                        Allocation_Retention_Priority_AVP
        to the EPC_PGW_A entity
    }
}
```

TP Id	TP_GX_PCRF_RAR_04
Test Objective	When IUT receives ST-Answer from home PCRF then IUT sends an RA-Request
Reference	ETSI TS 129 212 [8], clause 4.5.2
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

```
with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the EPC_PCRF_A sends an STA
        to the EPC_PCRF_B entity
    }
    then {
        the EPC_PCRF_B sends the RAR containing
            Charging_Rule_Remove_AVP containing
                Charging_Rule_Name_AVP
        to the EPC_PGW_A entity
    }
}
```

7.8 S6a interface

TP Id	TP_S6A_MME_AIR_01
Test Objective	Verify that IUT after receipt of IP-CAN session establishment sends AI-Request
Reference	ETSI TS 129 272 [9], clause 5.2.3.1
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isNotAttachedTo the EPC_B and
the UE_A isNotRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends an IP_CAN session establishment request
to the EPC_MME_B entity
}
then {
the EPC_MME_B sends the AIR containing
User_Name_AVP
indicating value IMSI
Visited_PLMN_Id_AVP
Requested_EUTRAN_Authentication_Info_AVP
to the IMS_HSS_A entity
}
}	

TP Id	TP_S6A_HSS_AIA_01
Test Objective	Verify that IUT after receipt of AI-Request sends AI-Answer
Reference	ETSI TS 129 272 [9], clause 5.2.3.1
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isNotAttachedTo the EPC_B and
the UE_A isNotRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the EPC_MME_B sends a AIR
to the IMS_HSS_A entity
}
then {
the IMS_HSS_A sends the AIA containing
Result_Code_AVP
indicating value DIAMETER_SUCCESS
Authentication_Info_AVP
to the EPC_MME_B entity
}
}	

TP Id	TP_S6A_HSS_CLR_01
Test Objective	Verify that IUT after termination trigger sends CL-Request
Reference	ETSI TS 129 272 [9], clause 5.2.1.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isNotRegisteredTo the EPC_A
}	

Expected Behaviour

ensure that {
when {
the IMS_HSS_A triggers network detachment
}
then {
the IMS_HSS_A sends the CLR containing
User_Name_AVP
indicating value IMSI,
Cancellation_Type_AVP
indicating value Subscription_Withdrawal '2'
CLR_Flags_AVP
to the EPC_MME_A entity
}
}

TP Id	TP_S6A_MME_CLA_01
Test Objective	Verify that IUT after receipt of CL-Request sends CL-Answer
Reference	ETSI TS 129 272 [9], clause 5.2.1.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isNotRegisteredTo the EPC_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_HSS_A sends a CLR
to the EPC_MME_A entity
}
then {
the EPC_MME_A sends the CLA containing
Result_Code_AVP
indicating value DIAMETER_SUCCESS
to the IMS_HSS_A entity
}
}	

TP Id	TP_S6A_MME_PUR_01
Test Objective	Verify that IUT after termination trigger sends PU-Request
Reference	ETSI TS 129 272 [9], clause 5.2.1.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isNotRegisteredTo the EPC_A
}	

Expected Behaviour	

ensure that {
when {
the EPC_MME_A triggers purge to perform detachment
}
then {
the EPC_MME_A sends the PUR containing
User_Name_AVP
indicating value IMSI,
PUR_Flags_AVP
to the IMS_HSS_A entity
}
}	

TP Id	TP_S6A_HSS_PUA_01
Test Objective	Verify that IUT after receipt of PU-Request sends PU-Answer
Reference	ETSI TS 129 272 [9], clause 5.2.1.2
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isNotRegisteredTo the EPC_A
}	

Expected Behaviour	

ensure that {
when {
the EPC_MME_A sends a PUR
to the IMS_HSS_A entity
}
then {
the IMS_HSS_A sends the PUA containing
Result_Code_AVP
indicating value DIAMETER_SUCCESS
to the EPC_MME_A entity
}
}	

TP Id	TP_S6A_MME_ULR_01
Test Objective	Verify that IUT after receipt of IP-CAN session establishment sends UL-Request
Reference	ETSI TS 129 272 [9], clause 5.2.1.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isNotAttachedTo the EPC_A and
the UE_A isNotRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends an IP_CAN session establishment request
to the EPC_MME_A entity
}
then {
the EPC_MME_A sends the ULR containing
User_Name_AVP
indicating value IMSI
ULR_Flags_AVP
Visited_PLMN_Id_AVP
RAT_Type_AVP
to the IMS_HSS_A entity
}
}	

TP Id	TP_S6A_MME_ULR_02
Test Objective	Verify that IUT after receipt of IP-CAN session establishment sends UL-Request
Reference	ETSI TS 129 272 [9], clause 5.2.1.1
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isNotAttachedTo the EPC_B and
the UE_A isNotRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends an IP_CAN session establishment request
to the EPC_MME_B entity
}
then {
the EPC_MME_B sends the ULR containing
User_Name_AVP
indicating value IMSI	

```
            ULR_Flags_AVP
            Visited_PLMN_Id_AVP
            RAT_Type_AVP
        to the IMS_HSS_A entity
    }
}
```

TP Id	TP_S6A_HSS_ULA_01
Test Objective	Verify that IUT after receipt of UL-Request sends UL-Answer
Reference	ETSI TS 129 272 [9], clause 5.2.1.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

```
with {
            the UE_A isNotAttachedTo the EPC_A and
            the UE_A isNotRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the EPC_MME_A sends a ULR
        to the IMS_HSS_A entity
    }
    then {
        the IMS_HSS_A sends the ULA containing
            Result_Code_AVP
                indicating value DIAMETER_SUCCESS
            ULA_Flags_AVP
        to the EPC_MME_A entity
    }
}
```

TP Id	TP_S6A_HSS_ULA_02
Test Objective	Verify that IUT after receipt of UL-Request sends UL-Answer
Reference	ETSI TS 129 272 [9], clause 5.2.1.1
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

```
with {
            the UE_A isNotAttachedTo the EPC_B and
            the UE_A isNotRegisteredTo the IMS_A
        }
```

Expected Behaviour

```
ensure that {
    when {
        the EPC_MME_B sends a ULR
        to the IMS_HSS_A entity
    }
    then {
        the IMS_HSS_A sends the ULA containing
            Result_Code_AVP
                indicating value DIAMETER_SUCCESS
            ULA_Flags_AVP
        to the EPC_MME_B entity
    }
}
```

7.9 S9 interface

TP Id	TP_S9_PCRF_AAR_01
Test Objective	Verify that IUT receives AA-Request from visited P-CSCF and it sends AA-Request towards home PCRF
Reference	ETSI TS 129 215 [10], clause 4.5.3.6
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_B sends a AAR
to the EPC_PCRF_B entity
}
then {
the EPC_PCRF_B sends the AAR
to the EPC_PCRF_A entity
}
}	

TP Id	TP_S9_PCRF_AAA_01
Test Objective	Verify when IUT receives AA-Request from visited PCRF then it sends a AA-Answer
Reference	ETSI TS 129 215 [10], clause 4.5.3.6
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isNotAttachedTo the EPC_B and
the UE_A isNotRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the EPC_PCRF_B sends a AAR
to the EPC_PCRF_A entity
}
then {
the EPC_PCRF_A sends a AAA containing
Result_Code_AVP
indicating value DIAMETER_SUCCESS
to the EPC_PCRF_B entity
}
}	

TP Id	TP_S9_PCRF_AAA_02
Test Objective	Verify when IUT receives AA-Request from visited PCRF then it sends a AA-Answer.
Reference	ETSI TS 129 215 [10], clause 4.5.3.6
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isNotAttachedTo the EPC_B and
the UE_A isNotRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the EPC_PCRF_B sends a AAR
to the EPC_PCRF_A entity
}
then {
the EPC_PCRF_A sends a AAA containing
Result_Code_AVP
indicating value DIAMETER_SUCCESS
Acceptable_Service_Info_AVP containing	

```
                "one or more" Media_Component_Description_AVP
        to the EPC_PCRF_B entity
    }
}
```

TP Id	TP_S9_PCRF_ASR_01
Test Objective	Verify that IUT receives AS-Request from home PCRF and it sends AS-Request towards visited PCRF
Reference	ETSI TS 129 215 [10], clause 4.5.3.3
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the EPC_PCRF_A triggers termination_SIP_signalling_session
}
then {
the EPC_PCRF_A sends the ASR containing
Session_Id_AVP
Abort_Cause_AVP
indicating value BEARER_RELEASED
to the EPC_PCRF_B entity
}
}	

TP Id	TP_S9_PCRF_ASA_01
Test Objective	Verify that IUT receives AS-Answer from visited P-CSCF and it sends AS-Answer towards home PCRF
Reference	ETSI TS 129 215 [10], clause 4.5.3.3
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_P_CSCF_B sends a ASA
to the EPC_PCRF_B entity
}
then {
the EPC_PCRF_B sends the ASA
to the EPC_PCRF_A entity
}
}	

TP Id	TP_S9_PCRF_CCR_01
Test Objective	Verify that IUT receives CC-Request from P-GW and it sends CC-Request towards home PCRF
Reference	ETSI TS 129 215 [10], clauses 4.5.1.1 and 4.5.3.1
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isNotAttachedTo the EPC_B and
the UE_A isNotRegisteredTo the IMS_A
}	

Expected Behaviour

ensure that {
  when {
  the EPC_PGW_B sends an CCR
  to the EPC_PCRF_B entity
  }
  then {
  the EPC_PCRF_B sends an CCR containing
  CC_Request_Type_AVP
  indicating value INITIAL_REQUEST
  Subscription_Id_AVP containing
  Subscription_Id_Type_AVP
  indicating value END_USER_IMSI,
  IP_CAN_Type_AVP
  RAT_Type_AVP
  Called_Station_Id_AVP
  Framed_IP_Address_AVP
  "or" Framed_IP6_IP_Address_AVP
  QoS_Information_AVP
  Default_EPS_Bearer_QoS_AVP containing
  QoS_Class_Identifier_AVP
  indicating value '5'
  Allocation_Retention_Priority_AVP containing
  Priority_Level_AVP
  Pre_emption_Capablity_AVP
  Pre_emption_Vulnerability_AVP,
  Subsession_Enforcement_Info_AVP containing
  Subsession_Id_AVP
  Subsession_Operation_AVP
  indicating value ESTABLISHMENT
  to the EPC_PCRF_A entity
  }
}

TP Id	TP_S9_PCRF_CCR_02
Test Objective	Verify that IUT receives CC-Request from P-GW and it sends CC-Request towards home PCRF
Reference	ETSI TS 129 215 [10], clauses 4.5.1.2 and 4.5.3.3
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

with {
  the UE_A isAttachedTo the EPC_B and
  the UE_A isNotRegisteredTo the IMS_A
  }	

Expected Behaviour	

ensure that {
  when {
  the EPC_PGW_B sends an CCR
  to the EPC_PCRF_B entity
  }
  then {
  the EPC_PCRF_B sends an CCR containing
  CC_Request_Type_AVP
  indicating value TERMINATION_REQUEST
  Subsession_Enforcement_Info_AVP containing
  Subsession_Id_AVP
  Subsession_Operation_AVP
  indicating value TERMINATION
  to the EPC_PCRF_A entity
  }
}	

TP Id	TP_S9_PCRF_CCA_01
Test Objective	Verify when IUT receives CC-Request from visited PCRF then it sends a CC-Answer
Reference	ETSI TS 129 215 [10], clauses 4.5.1.1 and 4.5.3.1
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

with {
  the UE_A isNotAttachedTo the EPC_B and
  the UE_A isNotRegisteredTo the IMS_A
  }	

Expected Behaviour

ensure that {
  when {
  the EPC_PCRF_B sends a CCR
  to the EPC_PCRF_A entity
  }
  then {
  the EPC_PCRF_A sends a CCA containing
  Result_Code_AVP
  indicating value DIAMETER_SUCCESS
  Subsession_Decision_Info_AVP containing
  Subsession_Id_AVP
  QoS_Information_AVP containing
  APN_Aggregate_Max_Requested_Bandwidth_UL_AVP
  APN_Aggregate_Max_Requested_Bandwidth_DL_AVP
  Bearer_Identifier_AVP,
  Default_EPS_Bearer_QoS_AVP containing
  QoS_Class_Identifier_AVP
  indicating value '5'
  Allocation_Retention_Priority_AVP containing
  Priority_Level_AVP
  Pre_emption_Capablity_AVP
  Pre_emption_Vulnerability_AVP
  to the EPC_PCRF_B entity
  }
}

TP Id	TP_S9_PCRF_CCA_02
Test Objective	Verify when IUT receives CC-Request from visited PCRF then it sends a CC-Answer
Reference	ETSI TS 129 215 [10], clauses 4.5.1.2 and 4.5.3.3
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

with {
  the UE_A isAttachedTo the EPC_B and
  the UE_A isNotRegisteredTo the IMS_A
  }	

Expected Behaviour	

ensure that {
  when {
  the EPC_PCRF_B sends a CCR
  to the EPC_PCRF_A entity
  }
  then {
  the EPC_PCRF_A sends a CCA containing
  Result_Code_AVP
  indicating value DIAMETER_SUCCESS
  Subsession_Decision_Info_AVP containing
  Subsession_Id_AVP
  to the EPC_PCRF_B entity
  }
}	

TP Id	TP_S9_PCRF_STR_01
Test Objective	Verify that IUT receives ST-Request from visited P-CSCF and it sends ST-Request towards home PCRF
Reference	ETSI TS 129 215 [10], clause 4.5.3.6
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_B and
the UE_A isRegisteredTo the IMS_A
  }	

Expected Behaviour

ensure that {
  when {
  the IMS_P_CSCF_B sends a STR
  to the EPC_PCRF_B entity
  }
  then {
  the EPC_PCRF_B sends the STR
  to the EPC_PCRF_A entity
  }
}

TP Id	TP_S9_PCRF_STA_01
Test Objective	Verify when IUT receives ST-Request from visited PCRF then it sends a ST-Answer
Reference	ETSI TS 129 215 [10], clause 4.5.3.6
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

with {
  the UE_A isNotAttachedTo the EPC_B and
  the UE_A isNotRegisteredTo the IMS_A
  }	

Expected Behaviour	

ensure that {
  when {
  the EPC_PCRF_B sends a STR
  to the EPC_PCRF_A entity
  }
  then {
  the EPC_PCRF_A sends a STA containing
  Result_Code_AVP
  indicating value DIAMETER_SUCCESS
  to the EPC_PCRF_B entity
  }
}	

TP Id	TP_S9_PCRF_STA_02
Test Objective	Verify when IUT receives ST-Request from visited PCRF then it sends a ST-Answer
Reference	ETSI TS 129 215 [10], clause 4.5.3.6
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

with {
  the UE_A isAttachedTo the EPC_B and
  the UE_A isRegisteredTo the IMS_A
  }	

Expected Behaviour	

ensure that {
  when {
  the EPC_PCRF_B sends a STR
  to the EPC_PCRF_A entity
  }
  then {
  the EPC_PCRF_A sends a STA containing
  Result_Code_AVP
  indicating value DIAMETER_SUCCESS
  to the EPC_PCRF_B entity
  }
}	

7.10 Sh interface

TP Id	TP_SH_HSS_UDA_01
Test Objective	IUT successfully processes all mandatory AVPs in a UD-Request and sends UD-Answer
Reference	ETSI TS 129 328 [11], clause 6.1.1.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_AS_A sends a UDR containing
Session_ID_AVP
Vendor_Specific_Application_Id_AVP
Auth_Session_State_AVP
indicating value NO_STATE_MAINTAINED
Origin_Host_AVP
Origin_Realm_AVP
Destination_Realm_AVP
User_Identity_AVP
Data_Reference_AVP
to the IMS_HSS_A entity
}
then {
the IMS_HSS_A sends the UDA containing
Session_ID_AVP
Vendor_Specific_Application_Id_AVP
Auth_Session_State_AVP
Origin_Host_AVP
Origin_Realm_AVP
Result_Code_AVP
indicating value DIAMETER_SUCCESS
User_Data_AVP
to the IMS_AS_A entity
}
}	

7.11 ISC interface

TP Id	TP_ISC_SCSCF_REGISTER_01
Test Objective	Verify that the S-CSCF successfully processes registration towards AS when IMS supports 3rd-party registration
Reference	ETSI TS 124 229 [1], clause 5.4.1.7
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isNotRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the IMS_S_CSCF_A receives a REGISTER
from the IMS_I_CSCF_A entity
}
then {
the IMS_S_CSCF_A sends a REGISTER containing
From indicating value PX_SCSCF_SIP_URI,
To indicating value PX_AS_A_SIP_URI,
Request_Uri indicating value PX_AS_A_SIP_URI,
Contact indicating value PX_SCSCF_SIP_URI,
PChargingVector,
PChargingFunctionAddresses,
PAccessNetworkInfo
PVisitedNetworkId
to the IMS_AS_A entity	

```
        and the IMS_AS_A sends an 200_Ok containing
            From indicating value PX_AS_A_SIP_URI,
            To indicating value PX_SCSCF_SIP_URI,
            CallId,
            Via
        to the IMS_S_CSCF_A entity
    }
}
```

7.12 Rtp interface

TP Id	TP_RTP_UE_01
Test Objective	Verify that media between UE_A and UE_B is not delivered in any direction before call establishment
Reference	ETSI TS 124 229 [1], clause 6
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isAttachedTo the EPC_B and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends packets to the UE_B and
the UE_B sends packets to the UE_A entity
}
then {
the UE_B not receive media from the UE_A and
the UE_A not receive media from the UE_B entity
}
}	

TP Id	TP_RTP_UE_02
Test Objective	Verify that early media is delivered from UE_B to UE_A
Reference	ETSI TS 124 229 [1], clause 6
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isAttachedTo the EPC_B and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends packets to the UE_B and
the UE_B sends packets to the UE_A entity
}
then {
the UE_B not receive media from the UE_A and
the UE_A receives media from the UE_B entity
}
}	

TP Id	TP_RTP_UE_03
Test Objective	Verify that media between UE_A and UE_B is successfully routed
Reference	ETSI TS 124 229 [1], clause 6
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isAttachedTo the EPC_B and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends packets to the UE_B and
the UE_B sends packets to the UE_A entity
}
then {
the UE_B receives media from the UE_A and
the UE_A receives media from the UE_B entity
}
}	

TP Id	TP_RTP_UE_04
Test Objective	Verify that media between UE_A and UE_B is not delivered in any direction before call establishment
Reference	ETSI TS 124 229 [1], clause 6
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isAttachedTo the EPC_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends packets to the UE_B and
the UE_B sends packets to the UE_A entity
}
then {
the UE_B not receive media from the UE_A and
the UE_A not receive media from the UE_B entity
}
}	

TP Id	TP_RTP_UE_05
Test Objective	Verify that early media is delivered from UE_B to UE_A
Reference	ETSI TS 124 229 [1], clause 6
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isAttachedTo the EPC_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends packets to the UE_B and
the UE_B sends packets to the UE_A entity
}
then {
the UE_B not receive media from the UE_A and
the UE_A receives media from the UE_B entity	

```
    }
}
```

TP Id	TP_RTP_UE_06
Test Objective	Verify that media between UE_A and UE_B is successfully routed
Reference	ETSI TS 124 229 [1], clause 6
Configuration	CF_VxLTE_RMI
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A and
the UE_B isAttachedTo the EPC_A and
the UE_B isRegisteredTo the IMS_B
}	

Expected Behaviour	

ensure that {
when {
the UE_A sends packets to the UE_B and
the UE_B sends packets to the UE_A entity
}
then {
the UE_B receives media from the UE_A and
the UE_A receives media from the UE_B entity
}
}	

TP Id	TP_SIG_UE_01
Test Objective	Verify that IMS registration is possible over default bearer
Reference	ETSI TS 129 328 [11], clause 6.1.1.1
Configuration	CF_VxLTE_INT
PICS Selection	NONE
Initial Conditions	

with {
the UE_A isAttachedTo the EPC_A and
the UE_A isRegisteredTo the IMS_A
}	

Expected Behaviour	

ensure that {
when {
the UE_A completes initial_network_attachment
to the EPC_PGW_A entity
}
then {
the UE_A sends the data containing
"IPv4_address of UE_A or
IPv6_address of UE_A or
IPv4_address and IPv6_address of UE_A"
DNS_information
P_CSCF_information
"indicating value P-CSCF-IP_address or
indicating value P-CSCF-FQDN_address"
to the EPC_PGW_A entity
}
}	

Annex A (normative): TDL-TO source files

Each TP in clause 7 above has been written in TDL-TO and thus in a structured manner which is consistent with all other TPs. The TDL-TO text files for all test purposes are contained in archive ts_10365301v020101p0.zip which accompanies the present document.

Annex B (informative): Bibliography

PICS pro forma relevant to the Gm, Mw, ISC and Ic interfaces

- ETSI TS 102 790-1: "Core Network and Interoperability Testing (INT); IMS specific use of Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Conformance Testing; (3GPP™ Release 10); Part 1: Protocol Implementation Conformance Statement (PICS)".

PICS pro forma relevant to the Cx interface

- ETSI TS 103 289-1: "Core Network and Interoperability Testing (INT); Diameter Conformance testing for Cx and Dx interfaces; (3GPP Release 10); Part 1: Protocol Implementation Conformance Statement (PICS)".

PICS pro forma relevant to the Gx interface

- ETSI TS 101 606-1: "IMS Network Testing (INT); Diameter Conformance testing for Gx interface; Part 1: Protocol Implementation Conformance Statement (PICS)".

PICS pro forma relevant to the Rx interface

- ETSI TS 101 580-1: "Core Network and Interoperability Testing (INT); Diameter Conformance testing for Rx interface; (3GPP Release 10); Part 1: Protocol Implementation Conformance Statement (PICS)".

PICS pro forma relevant to the Sh interface

- ETSI TS 103 571-1: "Core Network and Interoperability Testing (INT); Diameter Conformance testing for Sh/Dh interface; (3GPP™ Release 13); Part 1: Protocol Implementation Conformance Statement (PICS)".

PICS pro forma relevant to the S6a interfaces

- ETSI TS 103 261-1: "Core Network and Interoperability Testing (INT); Diameter Conformance testing for S6a interface; (3GPP Release 10); Part 1: Protocol Implementation Conformance Statement (PICS)".

PICS pro forma relevant to the S9 interface

- ETSI TS 103 262-1: "Core Network and Interoperability Testing (INT); Diameter Conformance testing for S9 interface; (3GPP Release 10); Part 1: Protocol Implementation Conformance Statement (PICS)".

History

Document history		
V1.1.1	August 2020	Publication
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