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IMS Network Testing (INT);
IMS specific use of Session Initiation Protocol (SIP) and Session Description Protocol (SDP);
Conformance Testing;
Part 2: Test Suite Structure (TSS) and Test Purposes (TP)

Reference
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Contents

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Foreword

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

The present document is part 2 of a multi-part deliverable covering the IMS specific use of Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Conformance Testing, as identified below:

Part 1: "Protocol Implementation Conformance Statement (PICS)";

Part 2: "Test Suite Structure (TSS) and Test Purposes (TP)";

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

1 Scope

The present document provides the Test Suite Structure (TSS) and Test Purposes (TP) for the IP Multimedia core network Subsystem (IMS) equipment supporting the Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP) as specified in TS 124 229 [1] in compliance with the relevant requirements and in accordance with the relevant guidance given in ISO/IEC 9646-7 [4] and ETS 300 406 [5].

2 References

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

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

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

2.1 Normative references

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

[1] ETSI TS 124 229 (V10.7.0): "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3 (3GPP TS 24.229 version 10.7.0 Release 10)".

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

[3] Void

[4] ISO/IEC 9646-7: "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 7: Implementation Conformance Statements".

[5] ETSI ETS 300 406: "Methods for testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".

[6] ETSI ES 202 553: "Methods for Testing and Specification (MTS); TPLan: A notation for expressing Test Purposes".

[7] ETSI TS 102 790-1: "IMS Network Testing (INT); IMS specific use of Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Conformance Testing; Part 1: Protocol Implementation Conformance Statement (PICS)".

[8] IETF RFC 4028: "Session Timers in the Session Initiation Protocol (SIP)".

2.2 Informative references

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

[i.1] Void

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

abstract Selection Expression: Refer to ISO/IEC 9646-1 [2].

Abstract Test Method (ATM): Refer to ISO/IEC 9646-1 [2].

Abstract Test Suite (ATS): Refer to ISO/IEC 9646-1 [2].

Implementation Under Test (IUT): Refer to ISO/IEC 9646-1 [2].

Lower Tester (LT): Refer to ISO/IEC 9646-1 [2].

Test Purpose (TP): Refer to ISO/IEC 9646-1 [2].

3.2 Abbreviations

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

AS	Application Server
CSCF	Call Session Control Function
E-CSCF	Emergency CSCF
FQDN	Fully Qualified Domain Name
IBCF	Interconnection Border Control Function
I-CSCF	Interrogating CSCF
IMS	IP Multimedia Subsystem
IMS-AKA	IMS-Authentication and Key Agreement
IP	Internet Protocol
P-CSCF	Proxy CSCF
PICS	Protocol Implementation Conformance Statement
S-CSCF	Serving CSCF
SDP	Session Description Protocol
SIP	Session Initiation Protocol
SUT	System Under Test
TS	Test System
UE	User Equipment

4 Test configurations

Test purposes of the present document address the IMS functional entities that are accessible via the following standardized SIP interfaces: Gm, Mw, Ic, and ISC.

This clause introduces the test configurations that have been used for the definition of test purposes. Depending on the specific configuration the test system (TS) simulates the behaviour of one or more UEs or other IMS core networks communicating with the IMS core network under test. Test configurations try to cover various scenarios of IMS interworking and roaming conditions.

Some test configurations show dashed boxes to visualise the implicit presence of a UE in the TS. These dashed boxes have only been introduced to improve understanding but do not have to be reflected in a test suite implementation.

4.1 Test configurations using Gm interface only

The Gm interface is located between a UE and the IMS core network.

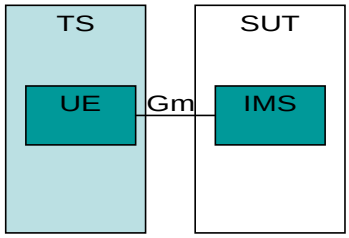

Figure 1: Test configuration CF_1Gm

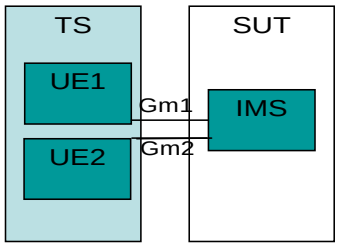

Figure 2: Test configuration CF_2Gm

4.2 Test configurations using the Mw interface

The Mw interface is used in case of interworking or roaming between two different IMS core networks. This interface is used only if no border control functions like topology hiding are required.

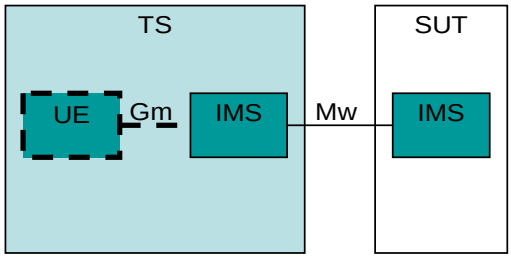

Figure 3: Test configuration CF_1Mw

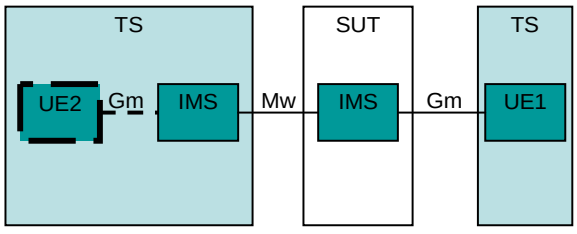

Figure 4: Test configuration CF_1Mw1Gm

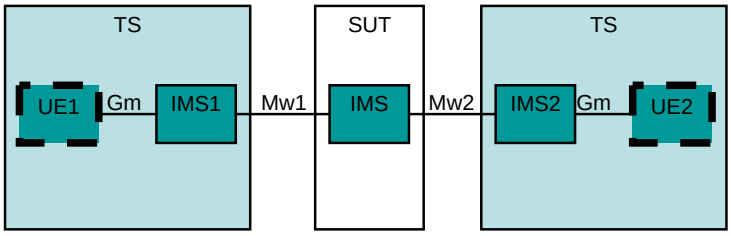

Figure 5: Test configuration CF_2Mw

4.3 Test configurations using the Ic interface

The Ic interface is used in case of interworking or roaming between two different IMS core networks. This interface is used only if border control functions like topology hiding are required.

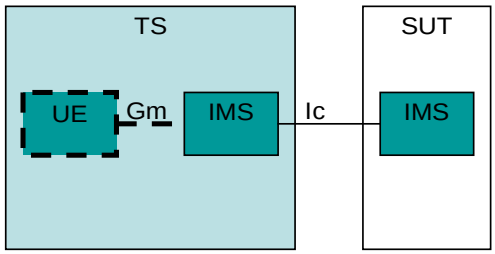

Figure 6: Test configuration CF_1Ic

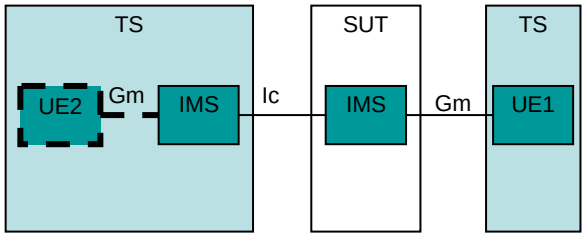

Figure 7: Test configuration CF_1Ic1Gm

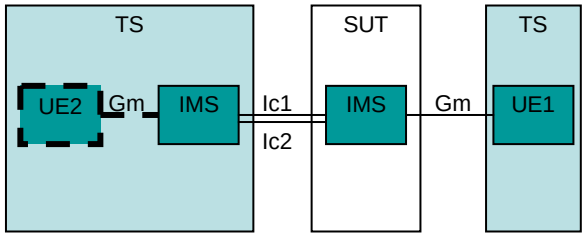

Figure 8: Test configuration CF_2Ic1Gm

4.4 Test configurations using the ISC interface

The ISC interface enables the IMS core network to communicate with a AS.

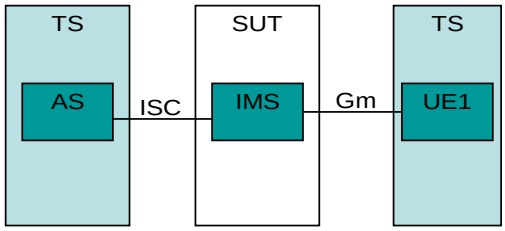

Figure 9: Test configuration CF_1ISC1Gm

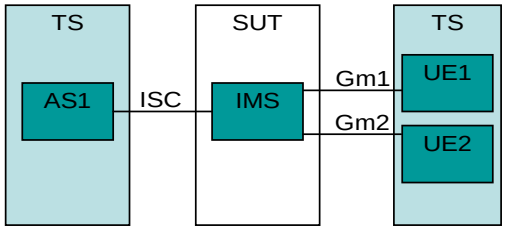

Figure 10: Test configuration CF_1ISC2Gm

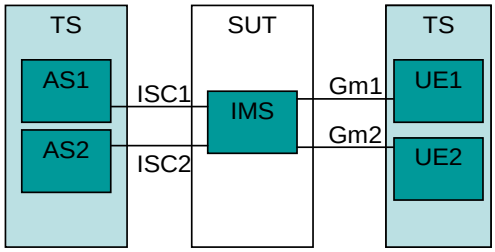

Figure 11: Test configuration CF_2ISC2Gm

5 Test Suite Structure (TSS)

5.1 TP structure

Test Purposes have been written for IMS core network functionality that is accessible via SIP based interfaces, i.e. P-, I-, E-, S-CSCF and IBCF components, as defined by TS 124 229 [1]. All test purposes in this document assess mandatory functionality unless they have been marked with the keyword "OPTIONAL" at the beginning of the TP summary.

The test purposes have been divided according to the interfaces into four major groups. Subgroups have been introduced to structure TPs further according to different procedures:

1) Test purposes for the Gm interface only:

   1.1) General;

   1.2) Registration procedures;

   1.3) Initial dialogue request procedures;

   1.4) Standalone requests procedures;

   1.5) Subsequent requests on a dialogue procedures;

1.6) Target refresh request procedures;

1.7) Emergency procedures;

1.8) Exceptional procedures;

1.9) SDP procedures;

1.10) NAT traversal procedures.

2) Test purposes for the Mw interface:

2.1) General;

2.2) Registration procedures;

2.3) Initial dialogue request procedures;

2.4) Standalone requests procedures;

2.5) Subsequent requests on a dialogue procedures;

2.6) Target refresh request procedures;

2.7) Emergency procedures;

2.8) SDP procedures.

3) Test purposes for the Ic interface:

3.1) General;

3.2) Registration procedures;

3.3) Initial dialogue request procedures;

3.4) Standalone requests procedures;

3.5) Subsequent requests on a dialogue procedures;

3.6) Target refresh request procedures.

4) Test purposes for the ISC interface:

4.1) Registration procedures;

4.2) Initial dialogue request procedures;

4.3) Standalone requests procedures;

4.4) Subsequent requests on a dialogue procedures;

4.5) Target refresh request procedures.

5.2 TP naming convention

TPs are numbered, starting at 01, within each group. Groups are organized according to the TSS. Additional references are added to identify the actual test suite and whether it applies to the network or the user (see table 1).

Table 1: TP identifier naming convention scheme

Identifier: **TP_<ts>_<int><subgroup>_<nn>**				
<ts>	=	Test suite name:	i.e. "IMS_T2"	
<int>	=	type of Interface:	"MW"	Mw interface
			"GM"	Gm Interface
			"IC"	Ic interface
			"ISC"	ISC interface
<subgroup>	=		subgroup	3 first letter of the subgroup according to TSS subdivision
			"GEN"	General
			"REG"	Registration procedures
			"INI"	Initial request procedures
			"STA"	Standalone request procedures
			"SUB"	Subsequent request on a dialogue procedures
			"TAR"	Target refresh request procedures
			"EME"	Emergency procedures
			"SDP"	SDP procedures
			"EXC"	Exceptional procedures
			"NAT"	NAT traversal procedures
<nn>	=	sequential number	(01-99)	

EXAMPLE 1: TP_IMS_T2_GM_GEN_01 stands for 1st test case in the Gm interface only group, and in the general subgroup.

All PICS items referred to in this clause are as specified in TS 102 790-1 [7] unless indicated otherwise by another numbered reference. For each PICS item there exists a unique reference defined as the table identifier, followed by a solidus character "/", followed by the item number in the table within TS 102 790-1 [7].

EXAMPLE 2: A.5/4 is the reference to the answer of item 4 in table A.5 of TS 102 790-1 [7].

5.3 The tabular symbolic TPLan presentation format

Each table contains header fields and a description part. The header fields identify the TP, list the related clause reference the base specification that the TP was derived from, introduce the TP with a short summary, references the related test configuration and test case in the ATS. Identifiers starting with the string "RQ_003_" indicate requirements within the internal requirement catalogue.

The description part presents the TP using two sections: (a) initial conditions that have to be fulfilled for the test purpose body to be valid and (b) the test purpose body which is illustrated with one or more stimulus/response pairs. Both sections are further substructured with columns for affected entities from the test configurations, i.e. IUT, UE, UE2, IMS (test system component), and AS.

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

Table 2 shows an example condition section illustrating all of the above examples.

Table 2: Example TP condition section

Entities		Condition
A	B	
✓	✓	A registered in B
	×	B configured for feature Z

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

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

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

Table 3 shows an example test purpose body section illustrating all of the above examples.

Table 3: Example TP body section

	A	B		
Step	**Direction**		**Message**	**IF**
1	↳	↱	**some request** ✓ this header ✓ this one parameter ➔ this value ✓ this other parameter ➔|| that value × that parameter × that header	**Xx**
2a	↰	⇃	**failure response**	**Xx**
2b	↰||	||⇃	**no message**	**Xx**

6 Test Purposes (TP)

The test purposes have been written in the notation TPLan as defined in ES 202 553 [6]. TPLan has been developed by ETSI to express test purposes in a more formal manner. All TPLan TPs have been converted into a symbolic tabular presentation format which is shown in this clause. TPs in the standardized textual TPLan syntax are collected in ts_10279002v020101p0.zip (see annex A). The two presentation formats, i.e. textual and symbolic tabular, contain the same information and shall therefore be considered equivalent. In the case that there appears to be syntactical or semantic differences between the two then the files in the electronic annex take precedence over the following tables.

6.1 Test purposes for the Gm interface only

6.1.1 General

Test Purpose					
Identifier:	**TP_IMST2_GM_GEN_01**				
Summary:	All IMS CN components shall support SIP messages which are greater than 1 300 bytes in length				
Clause:	4.2A, paragraph 1				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	
	Entities			**Condition**	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS as security association	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1	↳	↱		**MESSAGE** for UE2 ✓ Message Body greater than 1 300 bytes	
2		↳	↱	**MESSAGE**	**Gm**

6.1.2 Registration procedures

Test Purpose				
Identifier:	**TP_IMST2_GM_REG_01**			
Summary:	When a P-CSCF receives a REGISTER request from the UE and the REGISTER request was received without protection, and the Security-Client header is not present, then the P-CSCF shall return a suitable SIP 4xx response			
Clause:	5.2.2.2 first numbered list 2 a			
References:	-		**Config Ref:**	CF_1Gm
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**

	Entities		Condition	
	UE1	**IUT**		
	×	×	UE1 not registered in IUT	
		✓	IUT configured for establishing IMS AKA security association	
	✓		UE1 has initiated IMS AKA security association establishment	
	UE1	**IUT**		
Step	**Direction**		**Message**	**IF**
1	→		**unprotected REGISTER** × Security-Client header	
2	←		**4xx response**	**Gm**

Test Purpose			
Identifier:	**TP_IMST2_GM_REG_02**		
Summary:	When a P-CSCF receives a protected REGISTER request from the UE and the Security-Verify header is not present, then the P-CSCF shall return a suitable SIP 4xx response.		
Clause:	5.2.2.2 first numbered list 3)a		
References:	-	**Config Ref:**	CF_1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1**

	Entities		Condition	
	UE1	**IUT**		
	×	×	UE1 not registered in IUT	
		✓	IUT configured for establishing IMS AKA security association	
	✓		UE1 has sent unprotected REGISTER and has received 401 response	
	✓		UE1 has initiated IMS AKA security association establishment	
	UE1	**IUT**		

Step	Direction		Message	IF
1	→	→	**protected REGISTER** × Security-Verify header	
2	←	←	**4xx response**	**Gm**

Test Purpose			
Identifier:	**TP_IMST2_GM_REG_03**		
Summary:	When a P-CSCF receives a protected REGISTER request from the UE and the Security-Client header is not present, then the P-CSCF shall return a suitable SIP 4xx response.		
Clause:	5.2.2.2 first numbered list 3)a		
References:	-	**Config Ref:**	CF_1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1**

	Entities		Condition	
	UE1	**IUT**		
	×	×	UE1 not registered in IUT	
		✓	IUT configured for establishing IMS AKA security association	
	✓		UE1 has sent unprotected REGISTER and has received 401 response	
	✓		UE1 has initiated IMS AKA security association establishment	
	UE1	**IUT**		
Step	**Direction**		**Message**	**IF**
1	⇘	⇗	**protected REGISTER** × Security-Client header	
2	⇖	⇙	**4xx response**	**Gm**

Test Purpose			
Identifier:	**TP_IMST2_GM_REG_04**		
Summary:	When a P-CSCF receives an unprotected REGISTER request from the UE and the Security-Client header is not present, then the P-CSCF shall return a suitable SIP 4xx response.		
Clause:	5.2.2.2 first numbered list 3)b		
References:	-	**Config Ref:**	CF_1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1**

	Entities		Condition	
	UE1	**IUT**		
	×	×	UE1 not registered in IUT	
		✓	IUT configured for establishing IMS AKA security association	
	✓		UE1 has initiated IMS AKA security association establishment	
	UE1	**IUT**		
Step	**Direction**		**Message**	**IF**
1	⇘	⇗	**unprotected REGISTER** × Security-Client header	
2	⇖	⇙	**4xx response**	**Gm**

Test Purpose			
Identifier:	**TP_IMST2_GM_REG_05**		
Summary:	When a P-CSCF receives a protected REGISTER request from a non-registered UE and the private user identity conveyed in the Authorization header of the request are different from the ones previously challenged or authenticated, the P-CSCF shall reject the REGISTER request by returning a SIP 403 (Forbidden) response.		
Clause:	5.2.2.2 first numbered list 3)c		
References:	-	**Config Ref:**	CF_1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1**

Entities			Condition	
	UE1	**IUT**		
	×	×	UE1 not registered in IUT	
		✓	IUT configured for establishing IMS AKA security association	
	✓		UE1 has sent unprotected REGISTER and has received 401 response	
	✓		UE1 has initiated IMS AKA security association establishment	
	UE1	**IUT**		

Step	Direction		Message	IF
1	→		**protected REGISTER** ✓ Authorization header ➔ invalid private user identity	
2	←		**403 response**	**Gm**

Test Purpose				
Identifier:	**TP_IMST2_GM_REG_06**			
Summary:	When a P-CSCF receives a protected REGISTER request from a registered UE and the private user identity conveyed in the Authorization header of the request are different from the ones previously challenged or authenticated, the P-CSCF shall reject the REGISTER request by returning a SIP 403 (Forbidden) response.			
Clause:	5.2.2.2 first numbered list 3)c			
References:	-		**Config Ref:**	CF_1Gm
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**

	Entities		Condition	
	UE1	**IUT**		
	✓	✓	UE1 registered in IUT	
		✓	IUT configured for establishing IMS AKA security association	
	✓		UE1 has initiated IMS AKA security association establishment	
	UE1	**IUT**		

Step	Direction		Message	IF
1	→		**protected REGISTER** ✓ Authorization header ➔ invalid private user identity	
2	←		**403 response**	**Gm**

Test Purpose			
Identifier:	**TP_IMST2_GM_REG_07**		
Summary:	When a P-CSCF receives a unprotected REGISTER request from a non-registered UE it accepts it and returns a SIP 401 response.		
Clause:	5.2.2.2 second numbered list		
References:	-	**Config Ref:**	CF_1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1**

	Entities		Condition	
	UE1	**IUT**		
	×	×	UE1 not registered in IUT	
		✓	IUT configured for establishing IMS AKA security association	
	✓		UE1 has initiated IMS AKA security association establishment	
	UE1	**IUT**		

Step	Direction		Message	IF
1	→		**unprotected REGISTER**	
2	←		**401 response** ✓ Security-Server header ✓ static signalling plane ✓ WWW-Authenticate header × CK parameter × IK parameter	**Gm**

Test Purpose			
Identifier:	**TP_IMST2_GM_REG_08**		
Summary:	When a P-CSCF receives a SIP 200 (OK) response to a REGISTER request and the value of the Expires header field and/or the Expires parameter in the Contact header in the 200 (OK) response is not set to zero it passes the 200 (OK) to the UE.		
Clause:	5.2.2.2 third numbered list		
References:	-	**Config Ref:**	CF_1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1**

	Entities		Condition	
	UE1	**IUT**		
	×	×	UE1 not registered in IUT	
		✓	IUT configured for establishing IMS AKA security association	
	✓		UE1 has sent unprotected REGISTER and has received 401 response	
	✓		UE1 has initiated IMS AKA security association establishment	
	UE1	**IUT**		

Step	Direction		Message	IF
1	→		**protected REGISTER**	
2	←		**200 response**	**Gm**

Test Purpose			
Identifier:	**TP_IMST2_GM_REG_09**		
Summary:	If local policy requires the application of IBCF capabilities in the visited network and a P-CSCF fails to forward a REGISTER request from a UE to any IBCF, it shall return a SIP 504 (Server Time-out) response to the UE.		
Clause:	5.2.2.1 second numbered list 5)		
References:	-	**Config Ref:**	CF_1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1**

	Entities			Condition	
	UE1	**IUT**	**IMS**		
	✓	✓		UE1 is visiting IUT	
		✓		IUT configured for establishing digest without TLS security association	
		✓		IUT configured for topology hiding	
		×	×	IUT not configured with an entry point to IMS	
	UE1	**IUT**	**IMS**		

Step	Direction			Message	IF
1	→			**REGISTER**	
2	←			**504 response**	**Gm**

Test Purpose				
Identifier:	**TP_IMST2_GM_REG_11**			
Summary:	When a P-CSCF receives a REGISTER request from a registered UE and the value of the Expires header field and/or the Expires parameter in the Contact header is set to zero it sends a 200 (OK) to the UE.			
Clause:	5.2.5.1			
References:	-		**Config Ref:**	CF_1Gm
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**

	Entities		Condition	
	UE1	**IUT**		
	✓	✓	UE1 registered in IUT	
		✓	IUT configured for establishing digest without TLS security association	
	UE1	**IUT**		

Step	Direction		Message	IF
1	→		**REGISTER** ✓ Expires header ➔ 0	
2	←		**200 response** ✓ Expires header ➔ 0	**Gm**

6.1.3 Initial request procedures

Test Purpose					
Identifier:	**TP_IMST2_GM_INI_01**				
Summary:	When a P-CSCF receives an initial request for a dialogue from a UE then it forwards the request to destination UE and returns a SIP 100 (Trying) response to the originating UE.				
Clause:	5.2.1 before first numbered list; 5.2.6.3.3 item 1,4,5; 5.2.6.4.3 item 5,7; 5.2.7.2				
References:	-			**Config Ref:**	CF_2Gm
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	UE1	**IUT**	**UE2**		

Step	Direction			Message	IF
1	→			**INVITE** for UE2	
2	←			**100 response**	
3		→		**INVITE** ✓ Route header × SIP URI of IMS P-CSCF ✓ Record-Route header ➔ address of IUT P-CSCF **or** FQDN address of IUT P-CSCF ✓ Via header ➔ address of IUT P-CSCF **or** FQDN address of IUT P-CSCF × P-Charging-Vector header × P-Charging-Function-Addresses header × P-Preferred-Identity header	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_GM_INI_02**				
Summary:	When a P-CSCF receives an initial request for a dialogue from a UE with the preloaded Route not matching the stored Service-Route header then it either returns a SIP 400 response to the UE or forwards the request to destination UE with an updated Route header and returns a SIP 100 (Trying) response to the originating UE.				
Clause:	5.2.6.3.3 item 2; 5.2.7.2				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1, A.3/24.4.1**	

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	UE1	**IUT**	**UE2**		

Step	Direction			Message	IF
1	→	→		**INVITE** for UE2 ✓ Route header not matching stored Service-Route header	
2a	←	←		**400 response**	
3b		→‖	‖→	**no message**	
2b	←	←		**100 response**	
3b		→	→	**INVITE**	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_GM_INI_03**				
Summary:	When a P-CSCF receives any valid SIP 1xx response as a result of a forwarded request for an initial dialogue it forwards the response to originating UE.				
Clause:	5.2.6.3.4; 5.2.6.4.4 first numbered list				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	
	Entities			**Condition**	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓		IUT has received INVITE from UE1	
		✓	✓	IUT has sent INVITE to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1		→	←	**180 response** for UE1	
2	←	←		**180 response**	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_GM_INI_03A**				
Summary:	When a P-CSCF receives any valid SIP 1xx response as a result of a forwarded request for an initial dialogue it forwards the response to originating UE.				
Clause:	5.2.1 before first numbered list; 5.2.6.3.4; 5.2.6.4.4 first numbered list				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	
	Entities			**Condition**	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓		IUT has received INVITE from UE1	
		✓	✓	IUT has sent INVITE to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1		→	←	**180 response** for UE1 ✓ P-Preferred-Identity header	
2	←	←		**180 response** ✗ P-Charging-Vector header ✗ P-Charging-Function-Addresses header ✗ P-Preferred-Identity header	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_GM_INI_04**				
Summary:	When a P-CSCF receives any valid SIP 2xx response as a result of a forwarded request for an initial dialogue, it forwards the response to the originating UE.				
Clause:	5.2.6.3.4; 5.2.6.4.4 first numbered list				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	
	Entities			**Condition**	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓		IUT has received INVITE from UE1	
		✓	✓	IUT has sent INVITE to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1		→	→	**200 response** for UE1	
2	←	←		**200 response**	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_GM_INI_04A**				
Summary:	When a P-CSCF receives any valid SIP 2xx response as a result of a forwarded request for an initial dialogue, it forwards the response to the originating UE.				
Clause:	5.2.1 before first numbered list; 5.2.6.3.4; 5.2.6.4.4 first numbered list				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	
	Entities			**Condition**	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓		IUT has received INVITE from UE1	
		✓	✓	IUT has sent INVITE to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1		⇦	⇦	**200 response** for UE1 ✓ P-Preferred-Identity header	
2	⇦	⇦		**200 response** × P-Charging-Vector header × P-Charging-Function-Addresses header × P-Preferred-Identity header	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_GM_INI_05**				
Summary:	When a P-CSCF receives any other response other than a SIP 1xx or a 2xx to an initial request to a UE for a dialogue it forwards it to the originating UE.				
Clause:	5.2.6.4.4 second numbered list				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	
	Entities			**Condition**	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
		✓	✓	IUT has sent INVITE to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1		⇦	⇦	**4xx response** for UE1	
2	⇦	⇦		**4xx response**	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_GM_INI_06**				
Summary:	When a P-CSCF receives any other response other than a SIP 1xx or a 2xx to an initial request to a UE for a dialogue and if the list of Via headers does not match the saved list of Via headers received in the request corresponding to the same dialog, it either sends no message or forwards it to the originating UE.				
Clause:	5.2.6.4.4 second numbered list				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1, A.3/25.4.1**	
	Entities			**Condition**	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
		✓	✓	IUT has sent INVITE to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1		⇦	⇦	**4xx response** for UE1 ✓ Via header not matching stored Via header	
2a	⇦‖	‖⇦		**no message**	
2b	⇦	⇦		**4xx response** ✓ Via header ➔ stored Via header	**Gm**

Test Purpose			
Identifier:	**TP_IMST2_GM_INI_07**		
Summary:	If a P-CSCF requires periodic refreshment of a session established after receiving a SIP INVITE request from a UE and the Session-Expires header indicates a too low refresh frequency, it shall reject the INVITE.		
Clause:	5.2.7.2, RFC 4028 [8]		
References:	-	**Config Ref:**	CF_1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1, A.3/26.1.1**

	Entities		Condition	
	UE1	**IUT**		
	✓	✓	UE1 registered in IUT	
		✓	IUT configured for establishing digest without TLS security association	
	UE1	**IUT**		

Step	Direction		Message	IF
1	→		**INVITE** ✓ Supported header ➔ timer option tag ✓ Session-Expires header ➔|| acceptable expiration	
2	←		**422 response** ✓ Min-SE header	**Gm**

Test Purpose			
Identifier:	**TP_IMST2_GM_INI_08**		
Summary:	When a P-CSCF requires periodic refreshment of a session established after receiving a SIP INVITE request from a UE and the Session-Expires header of the INVITE request indicates acceptable refresh frequency then it forwards the request to the destination UE and returns a 100 (Trying) to the originating UE.		
Clause:	5.2.7.2, 5.2.8.3, RFC 4028 [8]		
References:	-	**Config Ref:**	CF_2Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1, A.3/26.1.1**

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1	→	←		**INVITE** ✓ Supported header ➔ timer option tag ✓ Session-Expires header ➔ acceptable expiration	
2	←	→		**100 response**	
3		→	←	**INVITE** ✓ Session-Expires header	**Gm**

6.1.4 Standalone requests procedures

Test Purpose					
Identifier:	**TP_IMST2_GM_STA_01**				
Summary:	When a P-CSCF receives a request for a standalone transaction from a UE with preloaded Route not matching the stored Service-Route header then it either returns a SIP 400 response to the UE or forwards the request to destination UE with an updated Route header and returns a SIP 100 (Trying) response to the originating UE.				
Clause:	5.2.6.3.7 item 2				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1, A.3/24.8.1**	

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1	→	←		**MESSAGE** for UE2 ✓ Route header not matching stored Service-Route header	
2a	←	→		**400 response**	
3a		→‖	‖←	**no message**	**Gm**
2b	←	→		**100 response**	
3b		→	←	**MESSAGE**	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_GM_STA_02**				
Summary:	When a P-CSCF receives a request for a standalone transaction from a UE with preloaded Route matching the stored Service-Route header then it forwards the request to destination UE and returns a SIP 100 (Trying) response to the originating UE.				
Clause:	5.2.1 before first numbered list; 5.2.6.3.7 item 1,4; 5.2.6.4.7 item 3				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	UE1	**IUT**	**UE2**		

Step	Direction			Message	IF
1	→			**MESSAGE** for UE2	
2	←			**100 response**	
3		→		**MESSAGE** ✓ Route header × SIP URI of IMS P-CSCF ✓ Via header ➔ address of IUT P-CSCF **or** FQDN address of IUT P-CSCF × P-Charging-Vector header × P-Charging-Function-Addresses header × P-Preferred-Identity header	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_GM_STA_03**				
Summary:	When a P-CSCF receives a SIP 200 response to a forwarded request for a standalone transaction then it forwards the request to the originating UE.				
Clause:	5.2.1 before first numbered list; 5.2.6.3.8, 5.2.6.4.8				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	
	Entities			**Condition**	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
		✓	✓	IUT has sent MESSAGE to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1		⇦	⇨	**200 response** for UE1	
2	⇦	⇨		**200 response** × P-Charging-Vector header × P-Charging-Function-Addresses header × P-Preferred-Identity header	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_GM_STA_04**				
Summary:	When a P-CSCF receives any 4xx response to a forwarded request for a standalone transaction then it forwards the request to the originating UE.				
Clause:	5.2.1 before first numbered list; 5.2.6.3.8, 5.2.6.4.8				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	
	Entities			**Condition**	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
		✓	✓	IUT has sent MESSAGE to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1		⇦	⇨	**4xx response** for UE1	
2	⇦	⇨		**4xx response** × P-Charging-Vector header × P-Charging-Function-Addresses header × P-Preferred-Identity header	**Gm**

Test Purpose			
Identifier:	**TP_IMST2_GM_STA_05**		
Summary:	When a P-CSCF receives any response for a standalone request to a UE for a dialogue and if the list of Via headers does not match the saved list of Via headers received in the request corresponding to the same dialog, it either sends no message or forwards it to the originating UE.		
Clause:	5.2.6.4.8		
References:	-	**Config Ref:**	CF_2Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1, A.3/24.10.1**

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
		✓	✓	IUT has sent MESSAGE to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1		→	←	**4xx response** for UE1 ✓ Via header not matching stored Via header	
2a	→||	||←		**no message**	
2b	→	←		**4xx response** ✓ Via header ➔ stored Via header	**Gm**

6.1.5 Subsequent request procedures

Test Purpose					
Identifier:	**TP_IMST2_GM_SUB_01**				
Summary:	When the P-CSCF receives a subsequent request for non-existing dialogue it rejects it with a SIP 403 response and does not forward it any further.				
Clause:	5.2.6.3.9 item 1a				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	×	×	×	IUT has not established an INVITE dialogue from UE1 to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1	→	→		**BYE** for UE2	
2	←	←		**403 response**	
3		→‖	‖←	**no message**	**Gm**

Test Purpose			
Identifier:	**TP_IMST2_GM_SUB_02**		
Summary:	When the P-CSCF receives a subsequent request with unknown URI in Route header it either rejects it with a SIP 400 response or forwards it with an updated Route header.		
Clause:	5.2.6.3.9 item 2		
References:	-	**Config Ref:**	CF_2Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1, A.3/24.8.1**

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1				**BYE** for UE2 ✓ Route header not matching stored Record-Route header	
2a				**400 response**	
3b				**no message**	
2b				**BYE**	**Gm**

Test Purpose			
Identifier:	**TP_IMST2_GM_SUB_03**		
Summary:	When the P-CSCF receives a subsequent request with unknown URI in Route header from the terminating UE it either rejects it with a SIP 400 response or forwards it with an updated Route header.		
Clause:	5.2.6.3.9 item 2		
References:	-	**Config Ref:**	CF_2Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1, A.3/24.8.1**

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1		→	→	**BYE** for UE1 ✓ Route header not matching stored Record-Route header	
2a		←	←	**400 response**	
3a	→‖	‖←		**no message**	
2b	→	→		**BYE**	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_GM_SUB_04**				
Summary:	When the P-CSCF receives a subsequent request for existing dialogue from the originating UE it forwards it to the destination UE without a P-Charging-Vector header.				
Clause:	5.2.1 before first numbered list; 5.2.6.3.9; 5.2.6.4.9				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	
	Entities			**Condition**	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1	→	←		**BYE** for UE2	
2		→	←	**BYE** × P-Charging-Vector header × P-Charging-Function-Addresses header	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_GM_SUB_05**				
Summary:	When the P-CSCF receives a subsequent request for existing dialogue from the terminating UE it forwards it to the destination UE without a P-Charging-Vector header.				
Clause:	5.2.1 before first numbered list; 5.2.6.3.9; 5.2.6.4.9				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	
	Entities			**Condition**	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1		←	→	**BYE** for UE1	
2	←	→		**BYE** × P-Charging-Vector header × P-Charging-Function-Addresses header	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_GM_SUB_06**				
Summary:	When the P-CSCF receives a SIP 200 to subsequent request from the originating UE it forwards it to the terminating UE.				
Clause:	5.2.6.4.10				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	✓	✓	✓	IUT has received BYE from UE1 for UE2	
		✓	✓	IUT has sent BYE to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1		🡸	🡻	**200 response** for UE1	
2	🡸	🡻		**200 response**	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_GM_SUB_06A**				
Summary:	When the P-CSCF receives a SIP 200 to subsequent request from the originating UE it forwards it to the terminating UE.				
Clause:	5.2.1 before first numbered list; 5.2.6.4.10				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	✓	✓	✓	IUT has received BYE from UE1 for UE2	
		✓	✓	IUT has sent BYE to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1		⇦	⇦	**200 response** for UE1	
2	⇦	⇦		**200 response** × P-Charging-Vector header × P-Charging-Function-Addresses header	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_GM_SUB_07**				
Summary:	When the P-CSCF receives a SIP 200 to subsequent request from the terminating UE it forwards it to the originating UE.				
Clause:	5.2.6.4.10				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	✓	✓	✓	IUT has received BYE from UE2 for UE1	
	✓	✓		IUT has sent BYE to UE1	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1	⇘	⇗		**200 response** for UE2	
2		⇘	⇗	**200 response**	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_GM_SUB_07A**				
Summary:	When the P-CSCF receives a SIP 200 to subsequent request from the terminating UE it forwards it to the originating UE.				
Clause:	5.2.1 before first numbered list; 5.2.6.4.10				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	✓	✓	✓	IUT has received BYE from UE2 for UE1	
	✓	✓		IUT has sent BYE to UE1	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1	→	←		**200 response** for UE2	
2		→	←	**200 response** × P-Charging-Vector header × P-Charging-Function-Addresses header	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_GM_SUB_08**				
Summary:	When the P-CSCF receives a SIP 200 with unknown Via header to a subsequent request from the terminating UE it either does not forward it or updates the Via heading prior to forwarding it.				
Clause:	5.2.6.4.10 item 1				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1, A.3/25.12.1**	

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	✓	✓	✓	IUT has received BYE from UE1 for UE2	
		✓	✓	IUT has sent BYE to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1				**200 response** for UE1 ✓ Via header not matching stored Via header	
2a				**no message**	
2b				**200 response** ✓ Via header ➔ stored Via header	**G** **n**

Test Purpose					
Identifier:	**TP_IMST2_GM_SUB_09**				
Summary:	When the P-CSCF receives a SIP 200 with unknown Via header to a subsequent request from the originating UE it either does not forward it or updates the Via heading prior to forwarding it.				
Clause:	5.2.6.4.10 item 1				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1, A.3/25.12.1**	

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	✓	✓	✓	IUT has received BYE from UE2 for UE1	
	✓	✓		IUT has sent BYE to UE1	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1	↘	↗		**200 response** for UE2 ✓ Via header not matching stored Via header	
2a		↘‖	‖↗	**no message**	
2b		↘	↗	**200 response** ✓ Via header ➔ stored Via header	**G** **n**

Test Purpose					
Identifier:	**TP_IMST2_GM_SUB_10**				
Summary:	Upon receipt of a request on a dialogue for which the P-CSCF has already initiated session release, the P-CSCF shall return 481 (Call/Transaction Does Not Exist) response.				
Clause:	5.2.8.1.3 paragraph 1				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
		✓	✓	IUT has received BYE from UE2	
	✓	✓		IUT has sent BYE to UE1	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1	→			**BYE** for UE2	
2	←			**481**	
3		→		**200**	**G** **n**

6.1.6 Target refresh request procedures

Test Purpose					
Identifier:	**TP_IMST2_GM_TAR_01**				
Summary:	When the P-CSCF receives a refresh request for non-existing dialogue it shall reject it with a SIP 403 response.				
Clause:	5.2.6.3.5 item 1a				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	×	×	×	IUT has not established an INVITE dialogue from UE1 to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1	→	→		**target refresh UPDATE** for UE2	
2	←	←		**403 response**	
3		→|	|←	**no message**	**G n**

Test Purpose					
Identifier:	**TP_IMST2_GM_TAR_02**				
Summary:	When the P-CSCF receives a refresh request with unknown URI in Route header it shall either reject it or forward it with an updated Route header.				
Clause:	5.2.6.3.5 item 2				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1, A.3/24.6.1**	

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1	→	←		**target refresh INVITE** for UE2 ✓ Route header not matching stored Record-Route header	
2a	←	→		**400 response**	
3a		→|	|←	**no message**	
2b	←	→		**100 response**	
3b		→	←	**INVITE**	**G** **n**

Test Purpose					
Identifier:	**TP_IMST2_GM_TAR_03**				
Summary:	When the P-CSCF receives a refresh request for existing dialogue from originating UE it shall return a SIP 100 and forward the request.				
Clause:	5.2.1 before first numbered list; 5.2.6.3.5 items 1A,3; 5.2.6.4.5				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1	↘	↗		**target refresh INVITE** for UE2	
2	↖	↙		**100 response**	
3		↘	↗	**target refresh INVITE** ✓ Route header × SIP URI of IMS P-CSCF ✓ Via header ➔ address of IUT P-CSCF **or** FQDN address of IUT P-CSCF × P-Charging-Vector header × P-Charging-Function-Addresses header	**G** **n**

Test Purpose					
Identifier:	**TP_IMST2_GM_TAR_04**				
Summary:	When the P-CSCF receives a refresh request for existing dialogue from terminating UE it shall return a SIP 100 and forward the request.				
Clause:	5.2.1 before first numbered list; 5.2.6.3.5 items 1A,3; 5.2.6.4.5				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1				**target refresh INVITE** for UE1	
2				**100 response**	
3				**target refresh INVITE** ✓ Route header ✗ SIP URI of IMS P-CSCF ✓ Via header ➔ address of IUT P-CSCF **or** FQDN address of IUT P-CSCF ✗ P-Charging-Vector header ✗ P-Charging-Function-Addresses header	**G** **n**

Test Purpose					
Identifier:	**TP_IMST2_GM_TAR_05**				
Summary:	When the P-CSCF receives a valid 180 response to refresh request from terminating UE it forwards the response to the originating UE.				
Clause:	5.2.1 before first numbered list; 5.2.6.3.6; 5.2.6.4.6				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	✓	✓	✓	IUT has received target refresh INVITE from UE1 for UE2	
		✓	✓	IUT has sent target refresh INVITE to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1		→	→	**180 response** for UE1	
2	←	←		**180 response** × P-Charging-Vector header × P-Charging-Function-Addresses header	**G** **n**

Test Purpose					
Identifier:	**TP_IMST2_GM_TAR_06**				
Summary:	When the P-CSCF receives a valid 180 response to refresh request from originating UE it forwards the response to the terminating UE.				
Clause:	5.2.1 before first numbered list; 5.2.6.3.6; 5.2.6.4.6				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	✓	✓	✓	IUT has received target refresh INVITE from UE2 for UE1	
	✓	✓		IUT has sent target refresh INVITE to UE1	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1	⇘	⇗		**180 response** for UE2	
2		⇘	⇗	**180 response** ✖ P-Charging-Vector header ✖ P-Charging-Function-Addresses header	**G** **n**

Test Purpose					
Identifier:	**TP_IMST2_GM_TAR_07**				
Summary:	When the P-CSCF receives a valid 200 response to refresh request from terminating UE, it returns a SIP ACK and forwards the response to the originating UE.				
Clause:	5.2.1 before first numbered list; 5.2.6.3.6; 5.2.6.4.6				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	✓	✓	✓	IUT has received target refresh INVITE from UE1 for UE2	
		✓	✓	IUT has sent target refresh INVITE to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1		⇦	⇦	**200 response** for UE1	
2		⇨	⇨	**ACK**	
3	⇦	⇦		**200 response** × P-Charging-Vector header × P-Charging-Function-Addresses header	**G** **n**

Test Purpose					
Identifier:	**TP_IMST2_GM_TAR_08**				
Summary:	When the P-CSCF receives a valid SIP 200 response to refresh request from originating UE, it returns a SIP ACK and forwards the response to the terminating UE.				
Clause:	5.2.1 before first numbered list; 5.2.6.3.6; 5.2.6.4.6				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	✓	✓	✓	IUT has received target refresh INVITE from UE2 for UE1	
	✓	✓		IUT has sent target refresh INVITE to UE1	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1	🡸	🡹		**200 response** for UE2	
2	🡺	🡻		**ACK**	
3		🡸	🡹	**200 response** × P-Charging-Vector header × P-Charging-Function-Addresses header	**G** **n**

Test Purpose					
Identifier:	**TP_IMST2_GM_TAR_09**				
Summary:	When the P-CSCF receives a valid 4xx response to refresh request from terminating UE it forwards the response to the originating UE.				
Clause:	5.2.1 before first numbered list; 5.2.6.4.6 second numbered list				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	✓	✓	✓	IUT has received target refresh INVITE from UE1 for UE2	
		✓	✓	IUT has sent target refresh INVITE to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1		⇦	⇦	**4xx response** for UE1	
2	⇦	⇦		**4xx response** ✖ P-Charging-Vector header ✖ P-Charging-Function-Addresses header	**G** **n**

Test Purpose					
Identifier:	**TP_IMST2_GM_TAR_10**				
Summary:	When the P-CSCF receives a valid SIP 4xx response to refresh request from originating UE it forwards the response to the terminating UE.				
Clause:	5.2.1 before first numbered list; 5.2.6.4.6 second numbered list				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	✓	✓	✓	IUT has received target refresh INVITE from UE2 for UE1	
	✓	✓		IUT has sent target refresh INVITE to UE1	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1	⇦	⇨		**4xx response** for UE2	
2		⇦	⇨	**4xx response** ✗ P-Charging-Vector header ✗ P-Charging-Function-Addresses header	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_GM_TAR_11**				
Summary:	When the P-CSCF receives a 4xx with unknown Via header to refresh request from the terminating UE it either does not forward the message or forwards it with an updated Via header.				
Clause:	5.2.6.4.6 second numbered list item 1				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1, A.3/25.8.1**	

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	✓	✓	✓	IUT has received target refresh INVITE from UE1 for UE2	
		✓	✓	IUT has sent target refresh INVITE to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1				**4xx response** for UE1 ✓ Via header not matching stored Via header	
2a				**no message**	
2b				**4xx response** ✓ Via header ➔ stored Via header	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_GM_TAR_12**				
Summary:	When the P-CSCF receives a 4xx with unknown Via header to refresh request from the originating UE it either does not forward the message or forwards it with an updated Via header.				
Clause:	5.2.6.4.6 second numbered list item 1				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1, A.3/25.8.1**	

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	✓	✓	✓	IUT has received target refresh INVITE from UE2 for UE1	
	✓	✓		IUT has sent target refresh INVITE to UE1	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1				**4xx response** for UE2 ✓ Via header not matching stored Via header	
2a				**no message**	
2b				**4xx response** ✓ Via header ➔ stored Via header	**Gm**

6.1.7 Emergency procedures

Test Purpose				
Identifier:	**TP_IMST2_GM_EME_01**			
Summary:	P-CSCF rejects INVITE to emergency service with 380 when emergency calls have to use the CS domain.			
Clause:	5.2.10.5 I); 7.6.4.1			
References:	-		**Config Ref:**	CF_1Gm
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**

	Entities		Condition	
	UE1	**IUT**		
		×	IUT not configured for emergency sessions	
	UE1	**IUT**		
Step	**Direction**		**Message**	**IF**
1	→	→	**INVITE** ✓ Request URI ➔ emergency service identifier	
2	←	←	**380 response** ✓ Content-Type header ✓ application/3gpp-ims+xml ✓ P-Asserted-Identity header ✓ SIP URI of IMS P-CSCF	**Gm**

Test Purpose				
Identifier:	**TP_IMST2_GM_EME_02**			
Summary:	P-CSCF accepts INVITE to emergency service from unregistered user and returns SIP 100 (Trying) response.			
Clause:	5.2.10.2			
References:	-		**Config Ref:**	CF_1Gm
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**

	Entities		Condition	
	UE1	**IUT**		
	×	×	UE1 not registered in IUT	
		✓	IUT configured for emergency sessions	
	UE1	**IUT**		
Step	**Direction**		**Message**	**IF**
1	→	→	**INVITE** ✓ Request URI ➔ emergency service identifier	
2	←	←	**100 response**	**Gm**
3	←‖	‖→	**4xx response**	**Gm**

Test Purpose				
Identifier:	**TP_IMST2_GM_EME_03**			
Summary:	P-CSCF rejects INVITE to non-emergency service from user with emergency registration with SIP 403 response.			
Clause:	5.2.10.3			
References:	-		**Config Ref:**	CF_1Gm
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**

	Entities		Condition	
	UE1	**IUT**		
	✓	✓	UE1 emergency registered in IUT	
	UE1	**IUT**		
Step	**Direction**		**Message**	**IF**
1	→	→	**INVITE** ✓ Request URI ➔‖ emergency service identifier	
2	←	←	**403 response**	**Gm**

Test Purpose				
Identifier:	**TP_IMST2_GM_EME_04**			
Summary:	P-CSCF accepts INVITE to emergency service from user with emergency registration and returns SIP 100 response.			
Clause:	5.2.10.3			
References:	-		**Config Ref:**	CF_1Gm
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**

	Entities		Condition	
	UE1	**IUT**		
	✓	✓	UE1 emergency registered in IUT	
	UE1	**IUT**		
Step	**Direction**		**Message**	**IF**
1	→	→	**INVITE** ✓ Request URI ➔ emergency service identifier	
2	←	←	**100 response**	**Gm**
3	←‖	‖→	**4xx response**	**Gm**

Test Purpose			
Identifier:	**TP_IMST2_GM_EME_05**		
Summary:	P-CSCF accepts INVITE to emergency service from user with normal registration and returns SIP 100 response.		
Clause:	5.2.10.4		
References:	-	**Config Ref:**	CF_1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1**

	Entities		Condition	
	UE1	**IUT**		
	✓	✓	UE1 registered in IUT	
	UE1	**IUT**		
Step	**Direction**		**Message**	**IF**
1	→	→	**INVITE** ✓ Request URI ➔ emergency service identifier	
2	←	←	**100 response**	**Gm**
3	←‖	‖←	**4xx response**	**Gm**

6.1.8 Exceptional procedures

Test Purpose					
Identifier:	**TP_IMST2_GM_EXC_01**				
Summary:	P-CSCF initiates call release due to unacceptable SDP offer in SIP 200 response.				
Clause:	5.2.8.1.2 item 3 and 4, 6.2				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓		IUT has received INVITE from UE1	
		✓	✓	IUT has sent INVITE to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1		⇦	⇦	**200 response** for UE1 ✓ unacceptable SDP offer	
2	⇦	⇦		**200 response**	
3	⇨	⇨		**ACK** ✓ SDP answer	
4	⇦	⇦		**BYE** ✓ Reason header ➔ 503 response code **or** 488 response code	
5		⇨	⇨	**ACK**	**Gm**
6		⇨	⇨	**BYE** ✓ Reason header ➔ 488 response code	**Gm**

Test Purpose			
Identifier:	**TP_IMST2_GM_EXE_01A**		
Summary:	When the P-CSCF receives a not valid SIP 200 response to refresh request from originating UE, P-CSCF initiates call release due to unacceptable SDP offer in SIP 200 response.		
Clause:	5.2.8.1.2 item 1 and 2, 6.2		
References:	-	**Config Ref:**	CF_2Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1**

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	✓	✓	✓	IUT has received target refresh INVITE from UE2 for UE1	
	✓	✓		IUT has sent target refresh INVITE to UE1	
	UE1	**IUT**	**UE2**		

Step	Direction			Message	IF
1	⇘	⇗		**200 response** for UE1 ✓ unacceptable SDP offer	
2		⇘	⇗	**200 response**	**Gm**
3		⇙	⇙	**ACK** ✓ SDP answer	
4		⇘	⇗	**BYE** ✓ Reason header ➔ 503 response code **or** 488 response code	**Gm**
5	⇙	⇙		**ACK**	
6	⇙	⇙		**BYE** ✓ Reason header ➔ 488 response code	

Test Purpose			
Identifier:	**TP_IMST2_GM_EXC_02**		
Summary:	OPTIONAL: P-CSCF initiates call release due to encrypted SDP offer in SIP 200 response.		
Clause:	5.2.8.1.2 item 3 and 4, 6.2		
References:	-	**Config Ref:**	CF_2Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1**

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓	✓	UE1 and UE2 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓		IUT has received INVITE from UE1	
		✓	✓	IUT has sent INVITE to UE2	
		✓		IUT configured to reject encrypted SDP offers	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1		⇦	⇦	**200 response** for UE1 ✓ encrypted SDP offer	
2	⇦	⇦		**200 response**	
3	⇨	⇨		**ACK** ✓ SDP answer	
4	⇦	⇦		**BYE** ✓ Reason header ➔ 503 response code **or** 488 response code	
5		⇨	⇨	**ACK**	**Gm**
6		⇨	⇨	**BYE** ✓ Reason header ➔ 488 response code	**Gm**

6.1.9 SDP procedures

Test Purpose			
Identifier:	**TP_IMST2_GM_SDP_01**		
Summary:	P-CSCF rejects INVITE with SDP offer with unacceptable media parameter with SIP 488 response.		
Clause:	6.2		
References:	-	**Config Ref:**	CF_1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1**

	Entities		Condition	
	UE1	**IUT**		
	✓	✓	UE1 registered in IUT	
		✓	IUT configured for establishing digest without TLS security association	
	UE1	**IUT**		
Step	**Direction**		**Message**	**IF**
1	→		**INVITE** ✓ SDP offer ➔ unacceptable media parameter	
2	←		**488 response** ✓ SDP offer	**Gm**

Test Purpose			
Identifier:	**TP_IMST2_GM_SDP_02**		
Summary:	OPTIONAL: P-CSCF rejects INVITE with encrypted SDP offer.		
Clause:	6.2		
References:	-	**Config Ref:**	CF_1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1, A.3/30.1.1**

	Entities		Condition	
	UE1	**IUT**		
	✓	✓	UE1 registered in IUT	
		✓	IUT configured for establishing digest without TLS security association	
		✓	IUT configured to reject encrypted SDP offers	
	UE1	**IUT**		
Step	**Direction**		**Message**	**IF**
1	→		**INVITE** ✓ encrypted SDP offer	
2	←		**4xx response**	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_GM_SDP_03**				
Summary:	P-CSCF forwards SIP response with unacceptable SDP media parameter offer in SIP 180 response to originating UE.				
Clause:	6.2				
References:	-		**Config Ref:**	CF_2Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IUT**	**UE2**		
	✓	✓		UE1 registered in IUT	
		✓		IUT configured for establishing digest without TLS security association	
	✓	✓		IUT has received INVITE from UE1	
		✓	✓	IUT has sent INVITE to UE2	
	UE1	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1		🡸	🡺	**180 response** for UE2 ✓ SDP offer ➔ unacceptable media parameter	
2	🡸	🡺		**180 response**	**Gm**

6.1.10 NAT traversal procedures

Test Purpose				
Identifier:	**TP_IMST2_GM_NAT_01**			
Summary:	P-CSCF does not respond to unprotected REGISTER from UE if Security-Client header that does not specify UDP tunneling support.			
Clause:	Annex K.2.2.2.2 first numbered list item 2a			
References:	-		**Config Ref:**	CF_1Gm
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**

	Entities		Condition	
	UE1	**IUT**		
	×	×	UE1 not registered in IUT	
		✓	IUT configured for establishing IMS AKA security association	
	✓		UE1 has initiated IMS AKA security association establishment	
	UE1	**IUT**		
Step	**Direction**		**Message**	**IF**
1	→	→	**unprotected REGISTER** ✓ Security-Client header ➔|| UDP-enc-tun support ✓ topmost Via header ✓ IP address different from IP source address	
2	→||	||→	**no message**	**Gm**

6.2 Test purposes for the Mw interface

6.2.1 General

Test Purpose						
Identifier:	**TP_IMST2_MW_GEN_01**					
Summary:	All IMS CN components shall support SIP messages which are greater than 1 300 bytes in length on Mw interface.					
Clause:	4.2A, paragraph 1					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
			×		IUT not configured for topology hiding	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	→		→		**MESSAGE** to UE2 ✓ Message Body greater than 1 300 bytes	**Gm**
2		←	←		**MESSAGE** to UE2	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_GEN_02**					
Summary:	A functional entity at the boundary of a trust domain shall remove the P-Access-Network-Info header from any SIP message sent out of the trust domain.					
Clause:	4.4.3, paragraph 1					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
			×		IUT not configured for topology hiding	
		×	×		IMS not configured for being in the same trust domain as IUT	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	→		→		**MESSAGE** to UE2	**Gm**
2		←	←		**MESSAGE** × P-Access-Network-Info header	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_GEN_03**					
Summary:	P-CSCF generates the ICID and includes it in the icid parameter of the P-Charging-Vector header.					
Clause:	4.5.2, paragraph 2					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
			×		IUT not configured for topology hiding	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	→		→		**MESSAGE** to UE2	**Gm**
2		←	←		**MESSAGE** ✓ P-Charging-Vector header ✓ icid parameter	**Mw**

Test Purpose					
Identifier:	**TP_IMST2_MW_GEN_04**				
Summary:	REGISTER requests exchanged between a P-CSCF in the visited network and the S-CSCF in the home network shall include the type 1 inter operator identifier (IOI).				
Clause:	4.5.4, paragraph 4				
References:	-		**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	
	Entities			**Condition**	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
	✓		✓	UE1 visiting IUT	
	UE1	**IMS**	**IUT**		
Step	**Direction**			**Message**	**IF**
1	↳		↱	**unprotected REGISTER**	**Gm**
2		↰	↲	**unprotected REGISTER** ✓ P-Charging-Vector header ✓ ioi parameter ➔ type1	**Mw**

Test Purpose					
Identifier:	**TP_IMST2_MW_GEN_05**				
Summary:	REGISTER responses exchanged between a P-CSCF in the visited network and the S-CSCF in the home network shall include the type 1 inter operator identifier (IOI).				
Clause:	4.5.4, paragraph 4				
References:	-		**Config Ref:**	CF_1Mw	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	
	Entities			**Condition**	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
	✓	✓		UE1 visiting IMS	
			✓	IUT has sent unprotected REGISTER and has received 401 response via Mw	
	UE1	**IMS**	**IUT**		
Step	**Direction**			**Message**	**IF**
1		↳	↱	**protected REGISTER**	**Mw**
2		↰	↲	**200 response** ✓ P-Charging-Vector header ✓ ioi parameter ➔ type1	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_GEN_06**					
Summary:	SIP ACK requests that are exchanged between a S-CSCF of the home originating network and a S-CSCF of the home terminating network shall include a type 2 inter operator identifier (IOI).					
Clause:	4.5.4, paragraph 4					
References:	-			**Config Ref:**	CF_1Gm1Mw	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓				UE1 has sent INVITE and has received 200 response	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	→		→		**ACK** to UE2	**Gm**
2		←	←		**ACK** to UE2 ✓ P-Charging-Vector header ✓ ioi parameter ➔ type2	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_GEN_07**					
Summary:	SIP 200 responses that are exchanged between a S-CSCF of the terminating originating network and a S-CSCF of the home network shall include a type 2 inter operator identifier (IOI) and forward the orig-ioi parameter from the P-Charging-Vector header in the initial request.					
Clause:	4.5.4, paragraph 4					
References:	-			**Config Ref:**	CF_1Gm1Mw	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓		✓		IUT has received INVITE addressed to UE1 via Mw	
	✓		✓		IUT has sent INVITE to UE1 via Gm	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	↳		↱		**200 response** to UE2	**Gm**
2		↰	↲		**200 response** to UE2 ✓ P-Charging-Vector header ✓ ioi parameter ➔ type2 ✓ orig-ioi parameter of initial INVITE	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_GEN_08**					
Summary:	A S-CSCF shall not pass any P-Charging-Function-Addresses header of SIP requests or responses sent to a visited network or UE.					
Clause:	4.5.5, paragraph 3					
References:	-			**Config Ref:**	CF_1Gm1Mw	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓				UE1 has sent INVITE and has received 200 response	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	→		→		**ACK** to UE2	**Gm**
2		←	←		**ACK** to UE2 × P-Charging-Function-Addresses header	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_GEN_09**					
Summary:	When the P-CSCF sends a SIP MESSAGE request to the UE, it shall remove the P-Charging-Function-Addresses and P-Charging-Vector headers before sending the message, if present.					
Clause:	5.2.1 before first numbered list					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**			
	✓		✓		UE1 registered in IUT	
		✓	✓		IUT configured with an entry point to IMS	
			×		IUT not configured for topology hiding	
	UE1	**IMS**	**IUT**			
Step	**Direction**				**Message**	**IF**
1		→	→		**MESSAGE** to UE1 ✓ P-Charging-Vector headers ✓ P-Charging-Function-Addresses header	**Mw**
2	←		←		**MESSAGE** to UE1 × P-Charging-Vector headers × P-Charging-Function-Addresses header	**Gm**

Test Purpose						
Identifier:	**TP_IMST2_MW_GEN_10**					
Summary:	When the P-CSCF sends a SIP 200 response to the UE, it shall remove the P-Charging-Function-Addresses and P-Charging-Vector headers before sending the message, if present.					
Clause:	5.2.1 before first numbered list					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓		✓	✓	IUT has received MESSAGE via Gm from UE1 addressed to UE2	
			✓	✓	IUT has sent MESSAGE via Mw addressed to UE2	
			✗		IUT not configured for topology hiding	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1		→	→		**200 response** originated by UE2 ✓ P-Charging-Vector headers ✓ P-Charging-Function-Addresses header	**Mw**
2	←		←		**200 response** to UE1 ✗ P-Charging-Vector headers ✗ P-Charging-Function-Addresses header	**Gm**

Test Purpose						
Identifier:	**TP_IMST2_MW_GEN_11**					
Summary:	Before forwarding a SIP MESSAGE request received from a UE, a P-CSCF shall remove any P-Charging-Function-Addresses and P-Charging-Vector headers received.					
Clause:	5.2.1 first numbered list item 1					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
			×		IUT not configured for topology hiding	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	→		→		**MESSAGE** to UE2 ✓ P-Charging-Vector headers of UE1 ✓ P-Charging-Function-Addresses header of UE1	**Gm**
2		←	←		**MESSAGE** to UE2 × P-Charging-Vector headers of UE1 × P-Charging-Function-Addresses header of UE1	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_GEN_12**					
Summary:	Before forwarding a SIP 200 response received from a UE, a P-CSCF shall remove any P-Charging-Function-Addresses and P-Charging-Vector headers received.					
Clause:	5.2.1 first numbered list item 1					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓		✓	✓	IUT has received MESSAGE originated by UE2 addressed to UE1 via Mw	
	✓		✓		IUT has sent MESSAGE via Gm to UE1	
			×		IUT not configured for topology hiding	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	→		→		**200 response** to UE2 ✓ P-Charging-Vector headers of UE1 ✓ P-Charging-Function-Addresses header of UE1	**Gm**
2		←	→		**200 response** to UE2 × P-Charging-Vector headers of UE1 × P-Charging-Function-Addresses header of UE1	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_GEN_13**					
Summary:	Before forwarding a SIP MESSAGE request received from a UE, a P-CSCF shall remove P-Access-Network-Info header if such header contains a "network-provided" parameter.					
Clause:	5.2.1 first numbered list item 3					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
			✗		IUT not configured for topology hiding	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	→		→		**MESSAGE** to UE2 ✓ P-Access-Network-Info header ✓ network provider parameter	**Gm**
2		←	←		**MESSAGE** to UE2 ✗ P-Access-Network-Info header	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_GEN_14**					
Summary:	Before forwarding a SIP 200 response received from a UE, a P-CSCF shall remove P-Access-Network-Info header if such header contains a "network-provided" parameter.					
Clause:	5.2.1 first numbered list item 3					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓		✓	✓	IUT has received MESSAGE addressed to UE1 originated by UE2 via Mw	
	✓		✓		IUT has sent MESSAGE via Gm to UE1	
			×		IUT not configured for topology hiding	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	↳		↱		**200 response** to UE2 ✓ P-Access-Network-Info header ✓ network provider parameter	**Gm**
2		↰	↲		**200 response** to UE2 × P-Access-Network-Info header	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_GEN_15**					
Summary:	A P-CSCF shall remove the P-Media-Authorization header from a SIP MESSAGE request from the UE before forwarding the message.					
Clause:	5.2.1 before NOTE 9					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
			×		IUT not configured for topology hiding	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	→		→		**MESSAGE** to UE2 ✓ P-Media-Authorization header	**Gm**
2		←	←		**MESSAGE** to UE2 × P-Media-Authorization header	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_GEN_16**					
Summary:	A P-CSCF shall remove the P-Media-Authorization header from a SIP 200 response from the UE before forwarding the message.					
Clause:	5.2.1 before NOTE 9					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓			✓	UE1 has received MESSAGE originated by UE2	
			×		IUT not configured for topology hiding	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	→		→		**200 response** to UE2 ✓ P-Media-Authorization header	**Gm**
2		←	←		**200 response** to UE2 × P-Media-Authorization header	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_GEN_17**					
Summary:	When a P-CSCF receives SIP Redirect response (3xx), other than a 305 (Use Proxy) response, to a request forwarded from the UE, it shall not resend the original message to any of the URIs specified in the Contact header field of the 3xx response.					
Clause:	5.2.1 before NOTE 10					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
			✓	✓	IUT has received MESSAGE addressed to UE2 via Gm	
			✓	✓	IUT has sent MESSAGE addressed to UE2 via Mw	
			×		IUT not configured for topology hiding	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1		→	→		**3xx response** different to 305 response ✓ contact header ✓ Contact URI	**Mw**
2		→||	||→		**MESSAGE** to Contact URI	**Mw**

6.2.2 Registration procedures

Test Purpose			
Identifier:	**TP_IMST2_MW_REG_01**		
Summary:	When a P-CSCF receives REGISTER request from the UE, it shall insert a correct Path header containing SIP URI identifying the P-CSCF, Require header with path option tag, P-Charging-Vector header with the icid parameter and a type 1 orig-ioi parameter identifying the sending network but not including term-ioi parameter, and insert a P-Visited-Network-ID header identifying the visited network at the home network.		
Clause:	5.2.2.1 second numbered list items 1,2,3,4		
References:	-	**Config Ref:**	CF_1Mw1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1**

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
		✓	✓	IUT configured with an entry point to IMS	
	✓		✓	UE1 visiting IUT	
	UE1	**IMS**	**IUT**		
Step	**Direction**			**Message**	**IF**
1	→		→	**unprotected REGISTER**	**Gm**
2		←	←	**unprotected REGISTER** ✓ Path header ✓ SIP URI of IMS P-CSCF ✓ Require header ✓ path tag parameter ✓ P-Charging-Vector header ✓ icid parameter ✓ orig-ioi parameter ➔ type1 of the sending network × term-ioi parameter ➔ type1 ✓ P-Visited-Network-ID header ✓ visited network pre-provisioned string	**Mw**

Test Purpose					
Identifier:	**TP_IMST2_MW_REG_02**				
Summary:	When a P-CSCF receives REGISTER request from the UE, it shall insert the parameter "integrity-protected" with a value "yes" into the Authorization header field if the REGISTER request was received protected with the security association and includes an authentication challenge response.				
Clause:	5.2.2.2 first numbered list item 1				
References:	-		**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	
	Entities			**Condition**	
	UE1	**IMS**	**IUT**		
			✗	IUT not configured for topology hiding	
			✓	IUT configured for IMS AKA authentication	
	✓		✓	UE1 visiting IUT	
	✓	✓	✓	UE1 has sent unprotected REGISTER and has received 401 response	
	✓			UE1 has established an IMS AKA security association	
	UE1	**IMS**	**IUT**		
Step	**Direction**			**Message**	**IF**
1	→		→	**protected REGISTER** ✓ authentication challenge response parameter	**Gm**
2		←	←	**REGISTER** ✓ Authorization header ✓ integrity-protected parameter ➔ yes	**Mw**

Test Purpose					
Identifier:	**TP_IMST2_MW_REG_03**				
Summary:	When a P-CSCF receives REGISTER request from the UE, it shall insert the parameter "integrity-protected" with a value "yes" into the Authorization header field if the REGISTER request was received on the security association created during the last successful authentication procedure.				
Clause:	5.2.2.2 first numbered list item 1				
References:	-		**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			✗	IUT not configured for topology hiding	
			✓	IUT configured for IMS AKA authentication	
	✓		✓	UE1 visiting IUT	
	✓			UE1 has established an IMS AKA security association	
	UE1	**IMS**	**IUT**		
Step	**Direction**			**Message**	**IF**
1	→		→	**protected REGISTER**	**Gm**
2		←	←	**REGISTER** ✓ Authorization header ✓ integrity-protected parameter ➔ yes	**Mw**

Test Purpose					
Identifier:	**TP_IMST2_MW_REG_04**				
Summary:	When a P-CSCF receives REGISTER request from the UE, it shall insert the parameter "integrity-protected" with a value "no" into the Authorization header field if the REGISTER request was not received protected with the security association and remove the Security-Client header if the header is present Also the rPort and received parameter of the Via header are set to the received port and IP address.				
Clause:	5.2.2.2 first numbered list item 2a b, c				
References:	-		**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
			✓	IUT configured for IMS AKA authentication	
	✓		✓	UE1 visiting IUT	
	×			UE1 has not established a security association	
	UE1	**IMS**	**IUT**		
Step	**Direction**			**Message**	**IF**
1	→		→	**unprotected REGISTER** ✓ Security-Client header	**Gm**
2		→	→	**REGISTER** ✓ Authorization header ✓ integrity-protected parameter ➔ no × Security-Client header ✓ Via header ✓ rPort parameter ➔ received source port ✓ received parameter ➔ received source IP address	**Mw**

Test Purpose					
Identifier:	**TP_IMST2_MW_REG_05**				
Summary:	When a P-CSCF receives REGISTER request from the UE without protection and without Security-Client header then the P-CSCF shall return a SIP 4xx response.				
Clause:	5.2.2.2 second numbered list item 5				
References:	-		**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			✗	IUT not configured for topology hiding	
			✓	IUT configured for IMS AKA authentication	
	✓		✓	UE1 visiting IUT	
	UE1	**IMS**	**IUT**		

Step	Direction			Message	IF
1	→		→	**unprotected REGISTER** ✗ Security-Client header	**Gm**
2		→ ||	|| →	**REGISTER**	**Mw**
3	←		←	**4xx response** to UE1	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_MW_REG_06**				
Summary:	When a P-CSCF receives REGISTER request from the UE if the REGISTER request was received with a temporary security association but without a Security-Verify header, then the P-CSCF shall return a 4xx response.				
Clause:	5.2.2.2 first numbered list item 3a				
References:	-		**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
			✓	IUT configured for IMS AKA authentication	
	✓		✓	UE1 visiting IUT	
	✓			UE1 has sent unprotected REGISTER and has received 401 response	
	✓			UE1 has established a temporary IMS AKAsecurity association	
	UE1	**IMS**	**IUT**		
Step	**Direction**			**Message**	**IF**
1	→		→	**protected REGISTER** × Security-Verify header	**Gm**
2		→ ||	|| →	**REGISTER**	**Mw**
3	←		←	**4xx response** to UE1	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_MW_REG_07**				
Summary:	When a P-CSCF receives REGISTER request from the UE if the REGISTER request was received via a temporary security association and the content of the Security-Verify and the Security-Client header do not match previous information then the P-CSCF shall reject the request by sending a 4xx response.				
Clause:	5.2.2.2 first numbered list item 3a				
References:	-		**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
			✓	IUT configured for IMS AKA authentication	
	✓		✓	UE1 visiting IUT	
	✓			UE1 has sent unprotected REGISTER and has received 401 response	
	✓			UE1 has established a temporary IMS AKAsecurity association	
	UE1	**IMS**	**IUT**		
Step	**Direction**			**Message**	**IF**
1	→		→	**protected REGISTER** ✓ Security-Verify header different to Security-Server header of 401 response ✓ Security-Client header equal to Security-Client header of unprotected REGISTER	**Gm**
2		→||	||→	**REGISTER**	**Mw**
3	←		←	**4xx response** to UE1	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_MW_REG_08**				
Summary:	When a P-CSCF receives REGISTER request from the UE if the REGISTER request was received via a temporary security association and Security-Verify header and Security-Client headers match previous information, the P-CSCF shall remove the Security-Verify and the Security-Client header.				
Clause:	5.2.2.2 first numbered list item 3a				
References:	-		**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
			✓	IUT configured for IMS AKA authentication	
	✓		✓	UE1 visiting IUT	
	✓			UE1 has sent unprotected REGISTER and has received 401 response	
	✓			UE1 has established a temporary IMS AKA security association	
	UE1	**IMS**	**IUT**		
Step	**Direction**			**Message**	**IF**
1	→		→	**protected REGISTER** ✓ Security-Verify header equal to Security-Server header of 401 response ✓ Security-Client header equal to Security-Client header of unprotected REGISTER	**Gm**
2		←	→	**REGISTER** × Security-Verify header × Security-Client header	**Mw**

Test Purpose					
Identifier:	**TP_IMST2_MW_REG_09**				
Summary:	When a P-CSCF receives REGISTER request from the UE if the REGISTER request was received via an already established security association, then the P-CSCF shall remove the Security-Client and Security-Verify headers if it is present.				
Clause:	5.2.2.2 first numbered list item 3b				
References:	-		**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
			✓	IUT configured for IMS AKA authentication	
	✓		✓	UE1 visiting IUT	
	✓			UE1 has established an IMS AKA security association	
	UE1	**IMS**	**IUT**		

Step	Direction			Message	IF
1	→		→	**protected REGISTER** ✓ Security-Verify header ✓ Security-Client header	**Gm**
2		←	→	**REGISTER** × Security-Verify header × Security-Client header	**Mw**

Test Purpose					
Identifier:	**TP_IMST2_MW_REG_10**				
Summary:	When a P-CSCF receives REGISTER request from the UE if the REGISTER request was received via an already established security association and the Security-Client header, then the P-CSCF shall return a suitable 4xx response.				
Clause:	5.2.2.2 first numbered list item 3b				
References:	-		**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
			✓	IUT configured for IMS AKA authentication	
	✓		✓	UE1 visiting IUT	
	✓			UE1 has established an IMS AKA security association	
	UE1	**IMS**	**IUT**		

Step	Direction			Message	IF
1	→		→	**protected REGISTER** × Security-Client header	**Gm**
2		→||	||→	**REGISTER**	**Mw**
3	←		←	**4xx response** to UE1	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_MW_REG_11**				
Summary:	When a P-CSCF receives REGISTER request from the UE if the REGISTER request was received via an already established security association and private user identity in the Authorization header differs from the one in the unprotected REGISTER request, then the P-CSCF shall return a 403 response.				
Clause:	5.2.2.2 first numbered list item 3b				
References:	-		**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
			✓	IUT configured for IMS AKA authentication	
	✓		✓	UE1 visiting IUT	
	✓			UE1 has sent unprotected REGISTER and has received 401 response	
	✓			UE1 has established an IMS AKA security association	
	UE1	**IMS**	**IUT**		
Step	**Direction**			**Message**	**IF**
1	→		→	**protected REGISTER** ✓ Authorization header ✓ private user identity different to private user identity of unprotected REGISTER	**Gm**
2		→||	||→	**REGISTER**	**Mw**
3	←		←	**403 response** to UE1	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_MW_REG_12**				
Summary:	When a P-CSCF receives SIP 401 (Unauthorized) response to a REGISTER request it shall remove the CK and IK values contained in the 401 (Unauthorized) response insert a Security-Server header in the response.				
Clause:	5.2.2.2 second numbered list item 2 and 3				
References:	-		**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			✗	IUT not configured for topology hiding	
			✓	IUT configured for IMS AKA authentication	
	✓		✓	UE1 visiting IUT	
	✓			UE1 has sent REGISTER	
	UE1	**IMS**	**IUT**		
Step	**Direction**			**Message**	**IF**
1		→	→	**401 response**	**Mw**
2	←		←	**401 response** to UE1 ✓ WWW-Authenticate header ✗ CK parameter ✗ IK parameter ✓ Security-Server header ✓ P-CSCF security list the parameters needed for the security association setup	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_MW_REG_14**				
Summary:	Upon receipt of a SIP 200 (OK) response to an initial SIP REGISTER request, a P-CSCF located in the visited network shall send a SIP SUBSCRIBE request to the entry point of the home network.				
Clause:	5.2.3 item 1 and 2				
References:	-		**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	
	Entities			**Condition**	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
			✓	IUT configured for establishing digest without TLS security association	
	✓		✓	UE1 visiting IUT	
	✓			UE1 has sent initial REGISTER	
	UE1	**IMS**	**IUT**		
Step	**Direction**			**Message**	**IF**
1		→	→	**200 response**	**Mw**
2		←	←	**SUBSCRIBE** ✓ Request-URI ✓ From header ✓ SIP URI of IUT P-CSCF ✓ To header ✓ SIP URI ➔ public user identity ✓ Event header ✓ reg parameter ✓ Expires header ✓ a value higher than the value in the 200 response ✓ P-Asserted-Identity header ✓ SIP URI of IUT P-CSCF inserted into the Path header during the registration of UE1 ✓ P-Charging-Vector header ✓ icid parameter	**Mw**

Test Purpose			
Identifier:	**TP_IMST2_MW_REG_15**		
Summary:	When an S-CSCF receives SIP REGISTER request in which the "integrity-protected" parameter of its Authorization header is set to the value "no", the Authorization header specifies a private user identity which has previously been used to register one or more public user identities which have not yet expired and authentication is successful, it shall perform network-initiated deregistration of the unexpired public user identities previously registered by the user.		
Clause:	5.4.1.2.1, 5.4.1.2.2, 5.4.1.5		
References:	-	**Config Ref:**	CF_1Mw
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/3**

	Entities			Condition	
	IMS	**IUT**	**UE2**		
		×		IUT not configured for topology hiding	
		✓		IUT configured for IMS AKA authentication	
	✓		✓	UE2 visiting IMS	
	✓	✓	✓	UE2 registered public user identity with current private user identity in IUT	
	✓	✓		IUT configured with an entry point to IMS	
	IMS	**IUT**	**UE2**		

Step	Direction			Message	IF
1				**REGISTER** originated by UE2 ✓ Authorization header ✓ integrity protected parameter ➔ no	**Mw**
2				**401 response** ✓ WWW-Authenticate header	**Mw**
3				**REGISTER** originated by UE2 ✓ Authorization header ✓ integrity protected parameter ➔ yes	**Mw**
4				**200 response**	**Mw**
5				**NOTIFY** ✓ NOTIFY body ✓ registered public user identity	**Mw**

Test Purpose			
Identifier:	**TP_IMST2_MW_REG_16**		
Summary:	When an S-CSCF receives SIP REGISTER request in which the "integrity-protected" parameter in the Authorization header is set to "no" and the To field contains an unregistered public user identity, the S-CSCF shall send a 401 (Unauthorized) response to the originating UE including WWW-Authenticate header with a realm, RAND, AUTN, algorithm, IK, and CK parameters.		
Clause:	5.4.1.2.1A		
References:	-	**Config Ref:**	CF_1Mw
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/3**

	Entities			Condition	
	IMS	**IUT**	**UE2**		
		×		IUT not configured for topology hiding	
		✓		IUT configured for IMS AKA authentication	
	✓		✓	UE2 visiting IMS	
	✓	✓		IUT configured with an entry point to IMS	
	IMS	**IUT**	**UE2**		

Step	Direction			Message	IF
1	→	←		**REGISTER** originated by UE2 ✓ Authorization header ✓ integrity protected parameter ➔ no ✓ To header ✓ a not registered public user identity	**Mw**
2	←	→		**401 response** ✓ WWW-Authenticate header ✓ realm parameter ➔ a globally unique name of the IUT S-CSCF ✓ RAND parameter ✓ AUTN parameter ✓ algorithm parameter ➔ AKAv1-MD5 ✓ ik parameter ✓ ck parameter	**Mw**

Test Purpose			
Identifier:	**TP_IMST2_MW_REG_17**		
Summary:	When an S-CSCF receives SIP REGISTER request without the "integrity-protected" parameter in the Authorization header, the S-CSCF shall perform the procedure for receipt of a REGISTER request without the "integrity-protected" parameter for the received public user identity and perform network-initiated de-registration if applicable.		
Clause:	5.4.1.2.1D		
References:	-	**Config Ref:**	CF_1Mw
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/3**

	Entities			Condition	
	IMS	**IUT**	**UE2**		
		×		IUT not configured for topology hiding	
	✓		✓	UE2 visiting IMS	
	✓	✓	✓	UE2 registered public user identity with another contact address in IUT	
		✓		IUT configured for NASS-IMS bundled authentication	
	✓	✓		IUT configured with an entry point to IMS	
	IMS	**IUT**	**UE2**		

Step	Direction			Message	IF
1	→			**REGISTER** originated by UE2 ✓ Authorization header × integrity protected parameter ✓ Contact header × registered public user identities	**Mw**
2	←			**200 response**	**Mw**
3	←			**NOTIFY** ✓ NOTIFY body ✓ registered public user identity	**Mw**

Test Purpose					
Identifier:	**TP_IMST2_MW_REG_18**				
Summary:	When S-CSCF receives SIP REGISTER request without the "integrity-protected" parameter in the Authorization header and for existing contact information, it shall process the REGISTER request as if the "integrity-protected" parameter in the Authorization header was set to "yes".				
Clause:	5.4.1.2.1D				
References:	-		**Config Ref:**	CF_1Mw	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/3**	

	Entities			Condition	
	IMS	**IUT**	**UE2**		
		×		IUT not configured for topology hiding	
	✓	✓	✓	UE2 registered public user identity with current private user identity in IUT	
		✓		IUT configured for NASS-IMS bundled authentication	
	✓	✓		IUT configured with an entry point to IMS	
	IMS	**IUT**	**UE2**		

Step	Direction			Message	IF
1	→			**REGISTER** originated by UE2 for registered public user identity ✓ Authorization header × integrity-protected parameter	**Mw**
2	←			**200 response**	**Mw**

Test Purpose			
Identifier:	**TP_IMST2_MW_REG_19**		
Summary:	When S-CSCF receives SIP REGISTER request without an Authorization header and for existing contact information, it shall process the REGISTER request as the "integrity-protected" parameter in the Authorization header was set to "yes".		
Clause:	5.4.1.2.1D		
References:	-	**Config Ref:**	CF_1Mw
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/3**

	Entities			Condition	
	IMS	**IUT**	**UE2**		
		×		IUT not configured for topology hiding	
	✓	✓	✓	UE2 registered public user identity with current private user identity in IUT	
		✓		IUT configured for NASS-IMS bundled authentication	
	✓	✓		IUT configured with an entry point to IMS	
	IMS	**IUT**	**UE2**		

Step	Direction			Message	IF
1	→			**REGISTER** originated by UE2 for registered public user identity × Authorization header	**Mw**
2	←			**200 response**	**Mw**

Test Purpose			
Identifier:	**TP_IMST2_MW_REG_20**		
Summary:	If a S-CSCF receives SIP REGISTER request from a UE and the request contains an Expires header which is set to a value shorter than the minimum time that the S-CSCF is able to process, it shall return a SIP 423 (Interval Too Brief) response containing Min-Expires header.		
Clause:	5.4.1.2.3		
References:	-	**Config Ref:**	CF_1Mw
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/3**

	Entities		Condition	
	IMS	**IUT**		
		×	IUT not configured for topology hiding	
		×	IUT not configured for IMS AKA authentication	
	✓	✓	IUT configured with an entry point to IMS	
	IMS	**IUT**		

Step	Direction		Message	IF
1	→		**REGISTER** originated by UE2 ✓ Expires header ➔ duration smaller than minimum	**Mw**
2	←		**423 response** ✓ Min-Expires header	**Mw**

Test Purpose					
Identifier:	**TP_IMST2_MW_REG_21**				
Summary:	When an S-CSCF receives SIP REGISTER request in which the "integrity-protected" parameter in the Authorization header is set to "yes", To header contains an unregistered public user identity, the S-CSCF shall send a 401 (Unauthorized) response to the originating UE including WWW-Authenticate header with realm, a RAND and AUTN, algorithm, ik, and the CK (Cipher Key) parameters.				
Clause:	5.4.1.2.2				
References:	-		**Config Ref:**	CF_1Mw	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/3**	

	Entities			Condition	
	IMS	**IUT**	**UE2**		
		×		IUT not configured for topology hiding	
	✓		✓	UE2 visiting IMS	
		✓		IUT configured for IMS AKA authentication	
	✓	✓		IUT configured with an entry point to IMS	
	IMS	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1	→			**REGISTER** originated by UE2 ✓ Authorization header ✓ integrity protected parameter ➔ yes ✓ To header ✓ a not registered public user identity	**Mw**
2	←			**401 response** ✓ WWW-Authenticate header ✓ realm parameter ➔ globally unique name ✓ RAND parameter ✓ AUTN parameter ✓ algorithm parameter ➔ AKAv1-MD5 ✓ ik parameter ✓ ck parameter	**Mw**

Test Purpose			
Identifier:	**TP_IMST2_MW_REG_22**		
Summary:	When an S-CSCF receives SIP REGISTER request containing an authentication challenge response from the UE and the integrity-protected parameter in the Authorization header is set to the value "yes", the S-CSCF shall return a SIP 200 (OK) response to the UE.		
Clause:	5.4.1.2.2, 5.4.1.2.2F		
References:	-	**Config Ref:**	CF_1Mw
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/3**

	Entities			Condition	
	IMS	**IUT**	**UE2**		
		×		IUT not configured for topology hiding	
	✓		✓	UE2 visiting IMS	
	✓	✓	✓	UE2 has sent unprotected REGISTER and has received 401 response	
		✓		IUT configured for IMS AKA authentication	
	✓	✓		IUT configured with an entry point to IMS	
	IMS	**IUT**	**UE2**		

Step	Direction			Message	IF
1	↳	⇗		**REGISTER** originated by UE2 ✓ Authorization header ✓ integrity protected parameter ➔ yes ✓ algorithm parameter ➔ AKAv1-MD5 ✓ username parameter ➔ private user identity ✓ response parameter ➔ valid challenge response ✓ initial CallID parameter	**Mw**
2	↰	⇙		**200 response** ✓ Path header ✓ P-Associated-URI header ✓ registered public user identities ✓ Service-Route header ✓ SIP URI ➔ IUT S-CSCF ✓ P-Charging-Function-Addresses header ✓ P-Charging-Vector header ✓ Contact header ✓ address of public user identity	**Mw**

Test Purpose			
Identifier:	**TP_IMST2_MW_REG_23**		
Summary:	If a S-CSCF receives SIP REGISTER request containing an authentication challenge response from the UE and the request is not the expected REGISTER and the integrity-protected parameter in the Authorization header is set to the value "yes", the S-CSCF shall return a SIP 403 (Forbidden) response to the UE.		
Clause:	5.4.1.2.3 last paragraph, 5.4.1.2.3A paragraph 1		
References:	-	**Config Ref:**	CF_1Mw
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/3**

	Entities			Condition	
	IMS	**IUT**	**UE2**		
		×		IUT not configured for topology hiding	
		✓		IUT configured for IMS AKA authentication	
	✓		✓	UE2 visiting IMS	
	✓	✓	✓	UE2 has sent unprotected REGISTER and has received 401 response	
	✓	✓		IUT configured with an entry point to IMS	
	IMS	**IUT**	**UE2**		

Step	Direction			Message	IF
1				**REGISTER** originated by UE2 ✓ Authorization header ✓ integrity-protected parameter ➔ yes ✓ unknown CallID parameter	**Mw**
2				**403 response** ✓ P-Charging-Vector header ✓ orig-ioi parameter ➔ type1	**Mw**

Test Purpose			
Identifier:	**TP_IMST2_MW_REG_24**		
Summary:	When an S-CSCF receives SIP REGISTER request from the UE containing an Authentication Synchronization (AUTS) directive indicating that the Sequence Number (SQN) was out of range, the S-CSCF shall return a SIP 401 (Unauthorized) or 403 (Forbidden).		
Clause:	5.4.1.2.3 last paragraph, 5.4.1.2.3A paragraph 3 before NOTE 3		
References:	-	**Config Ref:**	CF_1Mw
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/3**

	Entities			Condition	
	IMS	**IUT**	**UE2**		
		×		IUT not configured for topology hiding	
		✓		IUT configured for IMS AKA authentication	
	✓		✓	UE2 visiting IMS	
	✓	✓	✓	UE2 has sent unprotected REGISTER and has received 401 response	
	✓	✓		IUT configured with an entry point to IMS	
	IMS	**IUT**	**UE2**		

Step	Direction			Message	IF
1				**REGISTER** originated by UE2 ✓ Authorization header ✓ AUTS parameter ➔ invalid SQN parameter	**Mw**
2a				**401 response** to UE2 ✓ P-Charging-Vector header ✓ orig-ioi parameter ➔ type1	**Mw**
2b				**403 response** to UE2 ✓ P-Charging-Vector header ✓ orig-ioi parameter ➔ type1	**Mw**

Test Purpose			
Identifier:	**TP_IMST2_MW_REG_25**		
Summary:	When an S-CSCF receives SIP REGISTER request with the "integrity-protected" parameter in the Authorization header set to "yes" and neither the user identity received in the To header nor the private user identity received in the Authorization header of the REGISTER request match any of the S-CSCFs registered users, it shall return a SIP 500 (Server Internal Error) response to the UE.		
Clause:	5.4.1.2.3 last paragraph, 5.4.1.2.3A paragraph 4 before NOTE 6		
References:	-	**Config Ref:**	CF_1Mw
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/3**

	Entities			Condition	
	IMS	**IUT**	**UE2**		
		×		IUT not configured for topology hiding	
		✓		IUT configured for IMS AKA authentication	
	✓		✓	UE2 visiting IMS	
	✓	✓	✓	UE2 has sent unprotected REGISTER and has received 401 response	
	✓	✓		IUT configured with an entry point to IMS	
	IMS	**IUT**	**UE2**		

Step	Direction			Message	IF
1	→	→		**REGISTER** originated by UE2 ✓ Authorization header ✓ integrity-protected parameter ➔ yes × private user identity matching previous registered public user identity ✓ To header ➔ public user identity not matching previous registered public user identity	**Mw**
2	←	←		**500 response** to UE2 ✓ P-Charging-Vector header ✓ orig-ioi parameter ➔ type1	**Mw**

Test Purpose					
Identifier:	**TP_IMST2_MW_REG_26**				
Summary:	When an S-CSCF receives SIP REGISTER request which was expected to carry the response to an authentication challenge but the request contains no authentication challenge response from the UE and no Authentication Synchronization (AUTS) parameters indicating that the Message Authentication Code (MAC) parameter was invalid in the challenge, the S-CSCF shall return a SIP 403 (Forbidden) response to the UE.				
Clause:	5.4.1.2.3 last paragraph, 5.4.1.2.3A paragraph 2 before NOTE 2				
References:	-		**Config Ref:**	CF_1Mw	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/3**	

	Entities			Condition	
	IMS	**IUT**	**UE2**		
		×		IUT not configured for topology hiding	
		✓		IUT configured for IMS AKA authentication	
	✓	✓	✓	UE2 has sent unprotected REGISTER and has received 401 response	
	✓		✓	UE2 visiting IMS	
	✓	✓		IUT configured with an entry point to IMS	
	IMS	**IUT**	**UE2**		

Step	Direction			Message	IF
1	→			**subsequent** REGISTER originated by UE2 ✓ Authorization header × authentication challenge response parameter × AUTS parameter ➔ invalid MAC parameter	**Mw**
2	←			**403 response** to UE2 ✓ P-Charging-Vector header ✓ orig-ioi parameter ➔ type1	**Mw**

6.2.3 Initial request procedures

Test Purpose						
Identifier:	**TP_IMST2_MW_INI_06**					
Summary:	If a security association exists between the UE and P-CSCF, when a P-CSCF receives any SIP 1xx or 2xx response as a result of a forwarded request for an initial dialog, it shall replace in the response its own Record Route entry with its own SIP URI with the protected server port number of the security association and either the P-CSCF FQDN or the P-CSCF IP address.					
Clause:	5.2.6.3.4 item 4					
References:	-		**Config Ref:**	CF_1Mw1Gm		
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**		
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
	✓				UE1 has established a security association	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓		✓		IUT has received INVITE addressed to UE2	
		✓	✓		IUT has sent INVITE addressed to UE2	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1		⇘	⇗		**180 response** to UE1	**Mw**
2	⇖		⇙		**180 response** to UE1 ✓ Record Route header ✓ SIP URI of IUT P-CSCF ➔ port number of IUT P-CSCF for security association ➔ IP address of IUT P-CSCF or FQDN address of IUT P-CSCF	**Gm**

Test Purpose						
Identifier:	**TP_IMST2_MW_INI_07**					
Summary:	If a security association exists between the UE and P-CSCF, when a P-CSCF receives any SIP 1xx or 2xx response as a result of a forwarded request for an initial dialog, it shall replace in the response its own Record Route entry with its own SIP URI with the protected server port number of the security association and either the P-CSCF FQDN or the P-CSCF IP address.					
Clause:	5.2.6.3.4 item 4					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
	✓				UE1 has established a security association	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓		✓		IUT has received INVITE addressed to UE2	
		✓	✓		IUT has sent INVITE addressed to UE2	
	UE1	**IMS**	**IUT**	**UE2**		

Step	Direction				Message	IF
1		→	→		**200 response** to UE1	**Mw**
2	←		←		**200 response** to UE1 ✓ Record Route header ✓ SIP URI of IUT P-CSCF ➔ port number of IUT P-CSCF for security association ➔ IP address of IUT P-CSCF or FQDN address of IUT P-CSCF	**Gm**

Test Purpose						
Identifier:	**TP_IMST2_MW_INI_08**					
Summary:	When a P-CSCF receives SIP 1xx or 2xx response to an initial request for a dialogue from a UE, it shall remove the P-Preferred-Identity header, if present, and insert a P-Asserted-Identity header with the value saved from the P-Called-Party-ID header that was received in the initial request and the registration display name if available.					
Clause:	5.2.6.4.4 item 1					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
	✓		✓		IUT has stored display name of UE1	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓		✓	✓	IUT has received INVITE via Mw originated by UE2 addressed to UE1	
	✓		✓		IUT has sent INVITE via Gm to UE1	
	✓		✓		IUT has stored P-Called-Party-ID header of UE1	
	✓		✓		IUT has stored display name of UE1	
	UE1	**IMS**	**IUT**	**UE2**		

Step	Direction				Message	IF
1	⇘		⇗		**180 response** to UE2 ✓ P-Preferred-Identity header	**Gm**
2		⇖	⇙		**180 response** × P-Preferred-Identity header ✓ P-Asserted-Identity header ✓ stored display name parameter	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_INI_09**					
Summary:	When a P-CSCF receives SIP 1xx or 2xx response to an initial request for a dialogue from a UE, it shall remove the P-Preferred-Identity header, if present, and insert a P-Asserted-Identity header with the value saved from the P-Called-Party-ID header that was received in the initial request and the registration display name if available.					
Clause:	5.2.6.4.4 item 1					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
	✓		✓		IUT has stored display name of UE1	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓		✓	✓	IUT has received INVITE via Mw originated by UE2 addressed to UE1	
	✓		✓		IUT has sent INVITE via Gm to UE1	
	✓		✓		IUT has stored P-Called-Party-ID header of UE1	
	✓		✓		IUT has stored display name of UE1	
	UE1	**IMS**	**IUT**	**UE2**		

Step	Direction				Message	IF
1	→		→		**200 response** to UE2 ✓ P-Preferred-Identity header	**Gm**
2		←	←		**200 response** × P-Preferred-Identity header ✓ P-Asserted-Identity header ✓ stored display name parameter	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_INI_10**					
Summary:	When a P-CSCF receives SIP 1xx or 2xx response to an initial request for a dialogue from a UE, if Via headers do not match the saved list of Via headers received in the initial request corresponding to the same dialog, it either discards the response or replaces the Via header with the ones from the initial request.					
Clause:	5.2.6.4.4 item 2					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1, A.3/25.4.1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓		✓	✓	IUT has received INVITE via Mw originated by UE2 addressed to UE1	
	✓		✓		IUT has sent INVITE to UE1	
			✓		IUT has stored Via header	
	UE1	**IMS**	**IUT**	**UE2**		

Step	Direction				Message	IF
1	→		→		**180 response** to UE2 ✓ Via header not matching stored Via header	**Gm**
2a		→||	||→		**180 response**	**Mw**
2b		→	→		**180 response** ✓ Via header ➔ stored Via header	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_INI_11**					
Summary:	When a P-CSCF receives SIP 1xx or 2xx response to an initial request for a dialogue from a UE, if Via headers do not match the saved list of Via headers received in the initial request corresponding to the same dialog, it either discards the response or replaces the Via header with the ones from the initial request.					
Clause:	5.2.6.4.4 item 2					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1, A.3/25.4.1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓		✓	✓	IUT has received INVITE via Mw originated by UE2 addressed to UE1	
	✓		✓		IUT has sent INVITE to UE1	
			✓		IUT has stored Via header	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	→		→		**200 response** to UE2 ✓ Via header not matching stored Via header	**Gm**
2a		→||	||→		**200 response**	**Mw**
2b		→	→		**200 response** ✓ Via header ➔ stored Via header	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_INI_12**					
Summary:	When a P-CSCF receives SIP 1xx or 2xx response to an initial request for a dialogue from a UE, with a Record-Route header including a list of URIs different to the one received in the Record-Route header of the initial request, discards the response or replaces the Record-Route header values with those received in the initial request. If a security association exists, the P-CSCF adds to the Record-Route header the port number of its own Record-Route entry with its own SIP URI and the port number where it awaits subsequent requests from the calling party and with either the P-CSCF FQDN that resolves to its IP address; or the P-CSCF IP address; and remove the comp parameter if present.					
Clause:	5.2.6.4.4 item 3					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1, A.3/25.4.2**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
	✓				UE1 has established a security association	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓		✓	✓	IUT has received INVITE via Mw originated by UE2 addressed to UE1	
	✓		✓		IUT has sent INVITE to UE1	
			✓		IUT has stored Record-Route header	
	UE1	**IMS**	**IUT**	**UE2**		

Step	Direction				Message	IF
1					**180 response** to UE2 ✓ Record-Route header not matching stored Record-Route header	**Gm**
2a					**180 response**	**Mw**
2b					**180 response** ✓ Record-Route header ➔ stored Record-Route header ➔ port number of Record-Route header of IUT P-CSCF ➔ SIP URI port number of IUT P-CSCF ➔ FQDN address of IUT P-CSCF or IP address of IUT P-CSCF × comp parameter	**Mw**

Test Purpose				
Identifier:	**TP_IMST2_MW_INI_13**			
Summary:	When a P-CSCF receives SIP 1xx or 2xx response to an initial request for a dialogue from a UE, with a Record-Route header including a list of URIs different to the one received in the Record-Route header of the initial request, discards the response or replaces the Record-Route header values with those received in the initial request. If a security association exists, the P-CSCF adds to the Record-Route header the port number of its own Record-Route entry with its own SIP URI and the port number where it awaits subsequent requests from the calling party and with either the P-CSCF FQDN that resolves to its IP address; or the P-CSCF IP address; and remove the comp parameter if present.			
Clause:	5.2.6.4.4 item 3			
References:	-	**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1, A.3/25.4.2**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
	✓				UE1 has established a security association	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓		✓	✓	IUT has received INVITE via Mw originated by UE2 addressed to UE1	
	✓		✓		IUT has sent INVITE to UE1	
			✓		IUT has stored Record-Route header	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	⇘		⇗		**200 response** to UE2 ✓ Record-Route header not matching stored Record-Route header	**Gm**
2a		⇙‖	‖⇖		**200 response**	**Mw**
2b		⇙	⇖		**200 response** ✓ Record-Route header ➔ stored Record-Route header ➔ port number of Record-Route header of IUT P-CSCF ➔ SIP URI port number of IUT P-CSCF ➔ FQDN address of IUT P-CSCF or IP address of IUT P-CSCF × comp parameter	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_INI_14**					
Summary:	When a P-CSCF receives any other response other than a SIP 1xx or a 2xx to an initial request to a UE for a dialogue and if the list of Via headers does not match the saved list of Via headers received in the initial request corresponding to the same dialog, it shall either discard the response or replace the Via header values with those received in the initial request.					
Clause:	5.2.6.4.4 second numbered list					
References:	-		**Config Ref:**	CF_1Mw1Gm		
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1, A.3/25.4.1**		

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓		✓	✓	IUT has received INVITE via Mw originated by UE2 addressed to UE1	
	✓		✓		IUT has sent INVITE to UE1	
			✓		IUT has stored Via header	
	UE1	**IMS**	**IUT**	**UE2**		

Step	Direction				Message	IF
1	→		→		**4xx response** to UE2 ✓ Via header not matching stored Via header	**Gm**
2a		→ ||	|| →		**4xx response**	**Mw**
2b		→	→		**4xx response** ✓ Via header ➔ stored Via header	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_INI_15**					
Summary:	If a P-CSCF requires periodic refreshment of a session established after receiving a SIP INVITE request from a UE the P-CSCF shall insert a Session-Expires header field in the request before forwarding it if none was present in the request. The proxy SHALL NOT include a refresher parameter in the header field value.					
Clause:	5.2.7.2, RFC 4028 [8], clause 8					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1, A.3/26.1.1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
			✓		IUT configured for requiring periodic refreshment	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	→		→		**INVITE** to UE2 × Session-Expires header	**Gm**
2		←	←		**INVITE** ✓ Session-Expires header × refresher parameter	**Mw**
3	←		←		**100 response**	**Gm**

Test Purpose						
Identifier:	**TP_IMST2_MW_INI_16**					
Summary:	If a P-CSCF requires periodic refreshment of a session established after receiving a SIP INVITE request from a UE the P-CSCF shall insert a Session-Expires header field in the request before forwarding it if none was present in the request. The duration should not be lower than the value in the Min-SE header field in the request, if it is present.					
Clause:	5.2.7.2, RFC 4028 [8], clause 8					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1, A.3/26.1.1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
			✓		IUT configured for requiring periodic refreshment	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	→		→		**INVITE** to UE2 × Session-Expires header ✓ Min-SE header	**Gm**
2		←	←		**INVITE** ✓ Session-Expires header ✓ duration parameter greater than Min-SE header	**Mw**
3	←		←		**100 response**	**Gm**

Test Purpose				
Identifier:	TP_IMST2_MW_INI_18			
Summary:	If a P-CSCF requires periodic refreshment of a session established after receiving a SIP INVITE request destined for a UE the P-CSCF shall insert a Session-Expires header field in the request before forwarding it if none was present in the request. The proxy SHALL NOT include a refresher parameter in the header field value.			
Clause:	RFC 4028 [8], clause 8			
References:	-	**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1, A.3/26.2.1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
			✓		IUT configured for requiring periodic refreshment	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1		→	→		**INVITE** originated by UE2 to UE1 × Session-Expires header	**Mw**
2	←		←		**INVITE** to UE1 ✓ Session-Expires header × refresher parameter	**Gm**
3		←	←		**100 response**	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_INI_19**					
Summary:	If a P-CSCF requires periodic refreshment of a session established after receiving a SIP INVITE request destined for a UE the P-CSCF shall insert a Session-Expires header field in the request before forwarding it if none was present in the request. The duration should not be lower than the value in the Min-SE header field in the request, if it is present.					
Clause:	5.2.7.2, RFC 4028 [8], clause 8					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1, A.3/26.2.1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
			✓		IUT configured for requiring periodic refreshment	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	UE1	**IMS**	**IUT**	**UE2**		

Step	Direction				Message	IF
1		→	→		**INVITE** originated by UE2 to UE1 × Session-Expires header ✓ Min-SE header	**Mw**
2	←		→		**INVITE** to UE1 ✓ Session-Expires header ✓ duration parameter greater than Min-SE header	**Gm**
3		←	→		**100 response**	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_INI_20**					
Summary:	When a P-CSCF receives an initial SIP INVITE request destined for a UE it shall respond with a SIP 100 (Trying) provisional response before forwarding the INVITE to the UE.					
Clause:	5.2.7.3 paragraph 2					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			✗		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	UE1	**IMS**	**IUT**	**UE2**		

Step	Direction				Message	IF
1		→	→		**INVITE** to UE1	**Mw**
2		←	←		**100 response**	**Mw**
3	←		←		**INVITE** to UE1	**Gm**

Test Purpose						
Identifier:	**TP_IMST2_MW_INI_21**					
Summary:	When a S-CSCF receives a response to an initial request and the response contains term-ioi parameters and is not destined for an AS, the S-CSCF shall remove all received ioi parameters from the P-Charging-Vector header before forwarding the response.					
Clause:	5.4.3.2 before NOTE 20					
References:	-			**Config Ref:**	CF_1Gm1Mw	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/3**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓		✓	✓	IUT has sent INVITE from UE1 to UE2 via Mw	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1			⇦	⇨	**200 response** to UE1 ✓ P-Charging-Vector header ✓ ioi parameter	**Mw**
2	⇦		⇨		**200 response** to UE1 × P-Charging-Vector header ✓ ioi parameter	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_MW_INI_22**				
Summary:	When the S-CSCF receives an initial request for a new dialogue and the Request URI contains a barred public user identity, the S-CSCF shall reject the request by sending a SIP 404 (Not Found) response.				
Clause:	5.4.3.3 first numbered list item 1				
References:	-		**Config Ref:**	CF_1Mw	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/3**	
	Entities			**Condition**	
	IMS	**IUT**	**UE2**		
		×		IUT not configured for topology hiding	
	✓		✓	UE2 registered in IMS	
		×	×	UE2 not registered in IUT	
	✓	✓		IUT configured with an entry point to IMS	
	IMS	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1	→			**INVITE** ✓ Request URI ✓ barred public user identity	**Mw**
2	←			**404 response** to UE2	**Mw**

Test Purpose					
Identifier:	**TP_IMST2_MW_INI_23**				
Summary:	When the S-CSCF receives an initial request and the Request URI contains an invalid GRUU, the S-CSCF shall reject the request by sending a SIP 4xx response.				
Clause:	5.4.3.3 first numbered list 3A				
References:	-		**Config Ref:**	CF_1Mw	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/3**	
	Entities			**Condition**	
	IMS	**IUT**	**UE2**		
		×		IUT not configured for topology hiding	
	✓	✓		UE2 registered in IMS	
	✓	✓		IUT configured with an entry point to IMS	
	IMS	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1		←	→	**INVITE** ✓ Request URI ✓ invalid GRUU parameter	**Mw**
2	←			**4xx response** to UE2	**Mw**

Test Purpose					
Identifier:	**TP_IMST2_MW_INI_24**				
Summary:	When the S-CSCF receives an initial request and the P-Asserted-Service header indicates a service that is not subscribed-to by the user, the S-CSCF shall reject the request by sending a SIP 403 (Forbidden) response.				
Clause:	5.4.3.3 first numbered list 3C				
References:	-		**Config Ref:**	CF_1Mw	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/3**	

	Entities			Condition	
	IMS	**IUT**	**UE2**		
		×		IUT not configured for topology hiding	
	✓	✓		UE2 registered in IMS	
	✓	✓		IUT configured with an entry point to IMS	
		✓		IUT configured to reject unsubscribed service	
	IMS	**IUT**	**UE2**		
Step	**Direction**			**Message**	**IF**
1		→	→	**INVITE** ✓ P-Asserted-Service header ➔ unsubscribed service	**Mw**
2	←	←		**403 response** to UE2	**Mw**

Test Purpose					
Identifier:	**TP_IMST2_MW_INI_25**				
Summary:	When the S-CSCF receives an initial request without P-Asserted-Service header and the SDP offer indicates a service that is not subscribed-to by the user, the S-CSCF shall reject the request by sending a SIP 403 (Forbidden) response.				
Clause:	5.4.3.3 first numbered list 3D				
References:	-		**Config Ref:**	CF_1Mw	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/3**	

	Entities			Condition	
	IMS	**IUT**	**UE2**		
		×		IUT not configured for topology hiding	
	✓	✓		UE2 registered in IMS	
	✓	✓		IUT configured with an entry point to IMS	
		✓		IUT configured to reject unsubscribed service	
	IMS	**IUT**	**UE2**		

Step	Direction			Message	IF
1		→	←	**INVITE** × P-Asserted-Service header ✓ SDP offer ➔ unsubscribed service	**Mw**
2	←	←		**403 response** to UE2	**Mw**

6.2.4 Standalone requests procedures

Test Purpose						
Identifier:	**TP_IMST2_MW_STA_01**					
Summary:	When a P-CSCF receives a request for a standalone transaction from a UE, containing a list of URIs in the Route header different to the stored values of the Service-Route header from the last successful registration or re-registration, then the P-CSCF shall either return a SIP 400 (Bad Request) response and not forward the request or replace the received Route header value in the request with the value of the Service-Route header received during the last SIP 200 (OK) response for a registration or reregistration.					
Clause:	5.2.6.3.7 item 2					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1, A.3/24.8.1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
	✓		✓		IUT has stored Service-Route header of UE1	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	⇘		⇗		**MESSAGE** to UE2 ✓ Route header not matching stored Service-Route header	
2a		⇘‖	‖⇗		**MESSAGE**	**Mw**
3a	⇘		⇗		**400 response**	**Gm**
2b		⇘	⇗		**MESSAGE** ✓ Route header ✓ stored Record-Route header	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_STA_02**					
Summary:	When a P-CSCF receives request for a standalone transaction from a UE, it shall remove the P-Preferred-Identity header, if present, and insert a P-Asserted-Identity header with a value representing the initiator of the request and including display name if previously stored during registration.					
Clause:	5.2.6.3.7 item 4					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	**IMS**			**Selection Expression:**	**PICS A.2/1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
	✓		✓		IUT has stored display name of UE1	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	UE1	**IMS**	**IUT**	**UE2**		

Step	Direction				Message	IF
1	↳		↱		**MESSAGE** to UE2 ✓ P-Preferred-Identity header	
2		↰	↲		**MESSAGE** × P-Preferred-Identity header ✓ P-Asserted-Identity header ✓ stored display name parameter	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_STA_03**					
Summary:	When a P-CSCF receives request for a standalone transaction from a UE it shall add a P-Charging-Vector header with the icid parameter.					
Clause:	5.2.6.3.7 item 5					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
			✗		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
	✓		✓		IUT has stored Service-Route header of UE1	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	→		→		**MESSAGE** to UE2	
2		←	←		**MESSAGE** ✓ P-Charging-Vector header ✓ icid parameter	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_STA_04**					
Summary:	When a P-CSCF receives any response to a forwarded request for a standalone transaction, it shall forward the response to the UE.					
Clause:	5.2.6.3.8					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
			✗		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓		✓	✓	IUT has received MESSAGE from UE1 via Gm addressed to UE2	
			✓		IUT has sent MESSAGE via Mw	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1		→	→		**200 response** originated by UE2 to UE1	**Mw**
2	←		←		**200 response** to UE1	**Gm**

Test Purpose						
Identifier:	**TP_IMST2_MW_STA_05**					
Summary:	When a P-CSCF receives request for a standalone transaction or a request for an unknown method (that does not relate to an existing dialog) destined for a UE, it shall add its own address to the top of the received list of Via header in a format that contains the protected server port number of the security association, if established, between the UE and the P-CSCF and either the P-CSCF FQDN that resolves to the IP address of the security association or the P-CSCF IP address of the security association.					
Clause:	5.2.6.4.7 item 2					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
	✓				UE1 has established a security association	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1		→	→		**MESSAGE** originated by UE2 to UE1	**Mw**
2	←		←		**MESSAGE** to UE1 ✓ Via header ✓ port number of IUT P-CSCF for security association ✓ FQDN address of IUT P-CSCF or IP address of IUT P-CSCF for security association	**Gm**

Test Purpose						
Identifier:	**TP_IMST2_MW_STA_06**					
Summary:	When a P-CSCF receives any response to a request for a standalone transaction destined for a UE, if the list of Via headers does not match the saved list of Via headers received in the request, either discard the response or replace the Via header values with those received in the request.					
Clause:	5.2.6.4.8 item 1					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1, A.3/25.10.1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓		✓		IUT has received MESSAGE via Mw originated by UE2 addressed to UE1	
	✓		✓		IUT has sent MESSAGE via Gm to UE1	
			✓		IUT has stored Via header	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1					**200 response** ✓ Via header not matching stored Via header	**Gm**
2a					**200 response**	**Mw**
2b					**200 response** ✓ stored Via header	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_STA_07**					
Summary:	When a P-CSCF receives any response to a request for a standalone transaction destined for a UE, remove the P-Preferred-Identity header, if present, and insert a P-Asserted-Identity header with the saved public user identity from the P-Called-Party-ID header of the request plus the display name if previously stored during registration.					
Clause:	5.2.6.4.8 item 2					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓		✓	✓	IUT has received MESSAGE via Mw originated by UE2 addressed to UE1	
	✓		✓		IUT has sent MESSAGE via Gm to UE1	
			✓		IUT has stored public user identity from P-Called-Party-ID header	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	↳		↱		**200 response** to UE2 ✓ P-Preferred-Identity header	
2		↰	↲		**200 response** to UE2 × P-Preferred-Identity header ✓ P-Asserted-Identity header ✓ stored public user identity ✓ stored display name parameter	**Mw**

6.2.5 Subsequent requests on a dialogue procedures

Test Purpose						
Identifier:	**TP_IMST2_MW_SUB_01**					
Summary:	When a P-CSCF receives a subsequent request, other than a target refresh request, that does not relate to an existing dialogue in which the originator is involved then the P-CSCF shall send a SIP 403 (Forbidden) response back to the originator and not forward the request.					
Clause:	5.2.6.3.9 item 1a					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
			✗		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓			✓	UE1 has established an INVITE dialogue with UE2	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	→		→		**BYE** ✓ Call-ID header ➔|| existent dialog	**Gm**
2		→ ||	|| →		**BYE**	**Mw**
3	←		←		**403 response**	**Gm**

Test Purpose						
Identifier:	**TP_IMST2_MW_SUB_02**					
Summary:	When a P-CSCF receives a subsequent request, other than a target refresh request, from a UE, containing a list of URIs in the Route header different to the stored values of the Service-Route header for the existing dialogue then the P-CSCF shall either return a SIP 400 (Bad Request) response and not forward the request or replace the received Route header value in the request with the stored value of the Service-Route header for the same dialogue.					
Clause:	5.2.6.3.9 item 2					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1, A.3/24.10.1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
	✓		✓		IUT has stored Record-Route header of UE1	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓			✓	UE1 has established an INVITE dialogue with UE2	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	→		→		**BYE** ✓ Route header not matching stored Record-Route header	**Gm**
2b		→|	|→	**BYE**	**Mw**
3b	←		←		**400 response**	**Gm**
2a		←	←		**BYE** ✓ Route header ✓ stored Record-Route header	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_SUB_03**					
Summary:	When a P-CSCF receives a subsequent request, other than a target refresh request, from a UE, for dialogues that are not INVITE dialogues, it shall add a P-Charging-Vector header with the icid parameter.					
Clause:	5.2.6.3.9 item 3					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓			✓	UE2 has established a SUBSCRIBE dialogue with UE1	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	→		→		**PUBLISH**	**Gm**
2		←	←		**PUBLISH** ✓ P-Charging-Vector header ✓ icid parameter	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_SUB_04**					
Summary:	When a P-CSCF receives a subsequent request, other than a target refresh request, for a UE, if the request does not relate to an existing dialogue in which the originator is involved, then the P-CSCF shall send a SIP 403 (Forbidden) response back to the originator and not forward the request.					
Clause:	5.2.6.3.9 item 1a					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓			✓	UE2 has established an INVITE dialogue with UE1	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1		→	→		**BYE** to UE1 ✓ Call-ID header ➔|| existent dialog	**Mw**
2	←||		||←		**BYE** to UE1	**Gm**
3		←	←		**403 response**	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_SUB_05**					
Summary:	When a P-CSCF receives a subsequent request, other than a target refresh request, for a UE containing a list of Route headers different to the stored list of Record-Route headers for the same dialog, then the P-CSCF shall either return a SIP 400 (Bad Request) response and not forward the request or replace the Route header value in the request with the stored list of Record-Route headers for the same dialogue.					
Clause:	5.2.6.3.9 item 2					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1, A.3/24.10.1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓			✓	UE2 has established an INVITE dialogue with UE1	
			✓		IUT has stored Record-Route header	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1		→	→		**BYE** to UE1 ✓ Route header not matching stored Record-Route header	**Mw**
2a	←‖		‖←		**BYE** to UE1	**Gm**
3a		←	←		**400 response**	**Mw**
2b	←		←		**BYE** to UE1 ✓ stored Record-Route header	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_SUB_06**					
Summary:	When a P-CSCF receives a subsequent request, other than a target refresh request, for a UE for dialogues that are not INVITE dialogues, add a P-Charging-Vector header with the icid parameter.					
Clause:	5.2.6.2.9 item 3					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
			✗		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓			✓	UE2 has established a SUBSCRIBE dialogue with UE1	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1		→	→		**PUBLISH** to UE1	**Mw**
2	←		←		**PUBLISH** to UE1 ✓ P-Charging-Vector header	**Gm**

Test Purpose						
Identifier:	**TP_IMST2_MW_SUB_07**					
Summary:	When a P-CSCF receives a subsequent request, other than a target refresh request, for a UE, it shall add its own address to the top of the received list of Via header in a format that contains the protected server port number of the security association if one is established between the UE to the P-CSCF and either the P-CSCF FQDN that resolves to the IP address of the security association or the P-CSCF IP address of the security association.					
Clause:	5.2.6.4.9 item 1					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
	✓				UE1 has established an IMS AKA security association	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓			✓	UE2 has established an INVITE Dialogue with UE1	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1		→	→		**BYE** to UE1 originated by UE2	**Mw**
2	←		←		**BYE** to UE1 ✓ Via header ✓ port number of IUT P-CSCF for security association ✓ FQDN address of IUT P-CSCF or IP address of IUT P-CSCF for security association	**Gm**

Test Purpose						
Identifier:	**TP_IMST2_MW_SUB_07A**					
Summary:	When a P-CSCF receives a subsequent request, other than a target refresh request, for a UE, it shall add its own address to the top of the received list of Via header.					
Clause:	5.2.6.4.9 item 2					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
			✗		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
	✓				UE1 has established a digest without TLS security association	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓			✓	UE2 has established an INVITE Dialogue with UE1	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1		→	→		**BYE** to UE1 originated by UE2	**Mw**
2	←		←		**BYE** to UE1 ✓ Via header ✓ port number of IUT P-CSCF ✓ address of IUT P-CSCF	**Gm**

Test Purpose						
Identifier:	**TP_IMST2_MW_SUB_08**					
Summary:	When a P-CSCF receives a response to a subsequent request, other than a target refresh request, if the list of Via headers does not match the saved list of Via headers received in the subsequent request, the P-CSCF shall either discard the response or replace the Via header values with those received in the subsequent request.					
Clause:	5.2.6.4.10 item 1					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1, A.3/25.12.1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓			✓	UE2 has established an INVITE Dialogue with UE1	
			✓		IUT has stored Via header	
	✓		✓	✓	IUT has received BYE via Mw originated by UE2 addressed to UE1	
	✓		✓		IUT has sent BYE via Gm to UE1	
	UE1	**IMS**	**IUT**	**UE2**		

Step	Direction				Message	IF
1					**200 response** to UE2 ✓ Via header not matching stored Via header	**Gm**
2a					**200 response**	**Mw**
2b					**200 response** ✓ stored Via header	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_SUB_09**					
Summary:	If a P-CSCF receives a subsequent request within a dialogue for which it has previously initiated session release, the P-CSCF shall terminate the request and answer it with a SIP 481 (Call/Transaction Does Not Exist) response.					
Clause:	5.2.8.1.3 paragraph 1					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓				UE1 has established an INVITE dialog	
	✓		✓		IUT has received BYE from UE1	
			✓		IUT has sent BYE via Mw	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1		→	→		**BYE** to UE1	**Mw**
2		←	←		**481 response** to UE2	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_SUB_10**					
Summary:	When the registration lifetime of the only public user identity currently registered of the calling user expires while there is still an active dialogue that include this user and where the session was initiated with the public user identity currently registered, then the S-CSCF shall send a SIP BYE request destined for the called user and shall send a SIP BYE request destined for the calling user.					
Clause:	5.4.5.1.2A; 5.4.5.1.2 item 1					
References:	-			**Config Ref:**	CF_1Gm1Mw	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓		✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1					Registration of UE1 expires	
2	⇦		⇦		**BYE** to UE1	**Gm1**
3		⇦	⇦		**BYE** to UE2 ✓ Request-URI ➔ stored Contact header from initial INVITE ✓ To header ➔ To header from 200 response ✓ From header ➔ From header from initial INVITE ✓ Call-ID header ➔ From header from initial INVITE ✓ CSeq header as stored for direction calling to called ✓ Route header as stored for dialog ✓ Reason header	**Mw**

6.2.6 Target refresh request procedures

Test Purpose						
Identifier:	**TP_IMST2_MW_TAR_01**					
Summary:	When a P-CSCF receives a target refresh request not relating to an existing dialogue from a UE, it shall answer the request by sending a SIP 403 (Forbidden) response back to the originator and not forward the request.					
Clause:	5.2.6.3.5 item 1a					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	×		×	×	IUT has not established an INVITE dialogue from UE1 to UE2	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	→		→		**target refresh UPDATE** to UE2	**Gm**
2		→|	|→	**target refresh UPDATE** to IMS	**Mw**
3	←		←		**403 response** to UE1	**Gm**

Test Purpose						
Identifier:	**TP_IMST2_MW_TAR_02**					
Summary:	When a P-CSCF receives a target refresh request from a UE, containing a list of URIs in the Route header different to the stored values of the Record-Route headers for the same dialog, then the P-CSCF shall either return a SIP 400 (Bad Request) response and not forward the request or replace the received Route header value in the request with the stored list of Record-Route headers for the same dialogue.					
Clause:	5.2.6.3.5 item 2					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1, A.3/24.6.1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
	✓		✓		IUT has stored Record-Route header of UE1	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓		✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	→		→		**target refresh INVITE** to UE2 ✓ Route header not matching stored Record-Route header	
2a		→|	|→	**INVITE**	**Mw**
3a	←		←		**400 response**	**Gm**
2b		←	←		**INVITE** ✓ Route header ✓ stored Record-Route header	**Mw**
3b	←		←		**100 response**	**Gm**

Test Purpose						
Identifier:	**TP_IMST2_MW_TAR_03**					
Summary:	When a P-CSCF receives a target refresh request from a UE, it shall add its own address to the Via header and to the Record-Route header, the P-CSCF SIP URI shall be built in a format that contains the port number of the P-CSCF where it awaits responses (in Via header) and subsequent requests (in Record-Route header) from the called party, and either the P-CSCF FQDN that resolves to the IP address or the P-CSCF IP address and updated access-network-charging-info parameter shall be included in the P-Charging-Vector header field.					
Clause:	5.2.6.3.5 items 1A,2,3; 5.2.9.1					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓		✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	→		→		**target refresh INVITE** to UE2	
2		←	←		**INVITE** ✓ Route header × SIP URI of IMS P-CSCF ✓ Via header ✓ port number of IUT P-CSCF ✓ IP address of IUT P-CSCF or FQDN address of IUT P-CSCF ✓ Record-Route header ✓ SIP URI of IUT P-CSCF ➔ port number of IUT P-CSCF ➔ FQDN address of IUT P-CSCF or IP address of IUT P-CSCF ✓ P-Charging-Vector header ✓ updated access-network-charging-info parameter	**Mw**
3	←		←		**100 response**	**Gm**

Test Purpose						
Identifier:	**TP_IMST2_MW_TAR_04**					
Summary:	If a security association exists between the UE and P-CSCF, when a P-CSCF receives any SIP 1xx or 2xx response as a result of a forwarded target refresh request, it shall replace the address and port number of its own Record Route entry to the same value as for the response to the initial request for the dialogue.					
Clause:	5.2.6.3.6 item 1					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
	✓		✓		UE1 has established a security association in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓		✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	✓		✓		IUT has received target refresh INVITE from UE1	
			✓		IUT has sent target refresh INVITE via Mw	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1					**200 response**	**Mw**
2					**200 response** to UE1 ✓ Record Route header of IUT P-CSCF ➔ same address same port number of IUT P-CSCF of response to initial INVITE	**Gm**

Test Purpose						
Identifier:	**TP_IMST2_MW_TAR_04A**					
Summary:	If digest without TLS exists between UE and P-CSCF, when a P-CSCF receives any SIP 1xx or 2xx response as a result of a forwarded target refresh request, it shall forward target response.					
Clause:	5.2.6.3.6					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
			✗		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓		✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	✓		✓		IUT has received target refresh INVITE from UE1	
			✓		IUT has sent target refresh INVITE via Mw	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1		→	→		**200 response**	**Mw**
2	←		←		**200 response** to UE1	**Gm**

Test Purpose						
Identifier:	**TP_IMST2_MW_TAR_05**					
Summary:	When a P-CSCF receives a target refresh request for a dialogue destined for a UE it shall add its own address to the top of the received list of Via header in a format that if a security association exists between the UE and the P-CSCF, contains the protected server port number of the security association and either the P-CSCF FQDN that resolves to the IP address of the security association or the P-CSCF IP address of the security association.					
Clause:	5.2.6.4.5 item 1,3; 5.2.9.2 paragraph 1					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
	✓				UE1 has established a security association with IUT P-CSCF	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓		✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	✓		✓		IUT has received target refresh INVITE via Mw addressed to UE1	
	✓		✓		IUT has sent target refresh INVITE via Gm to UE1	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1		→	→		**target refresh INVITE** to UE1	**Mw**
2	←		←		**target refresh INVITE** to UE1 ✓ Via header ✓ port number of IUT P-CSCF for security association ✓ as topmost the IP address of IUT P-CSCF or the FQDN address of IUT P-CSCF ✓ Record-Route header ➔ as topmost the SIP URI of IUT P-CSCF	**Gm**
3		←	←		**100 response**	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_TAR_05A**					
Summary:	When a P-CSCF receives a target refresh request for a dialogue destined for a UE it shall add its own address to the top of the received list of Via header in a format that if digest without TLS exists between the UE and the P-CSCF.					
Clause:	5.2.6.4.5 item 2,4; 5.2.9.2 paragraph 1					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓		✓	✓	IUT has established an INVITE dialogue from UE1 to UE2	
	✓		✓		IUT has received target refresh INVITE via Mw addressed to UE1	
	✓		✓		IUT has sent target refresh INVITE via Gm to UE1	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1		→	→		**target refresh INVITE** to UE1	**Mw**
2	←		←		**target refresh INVITE** to UE1 ✓ Via header ✓ port number of IUT P-CSCF ✓ as topmost the address of IUT P-CSCF ✓ Record-Route header ➔ as topmost the SIP URI of IUT P-CSCF	**Gm**
3		←	←		**100 response**	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_TAR_06**					
Summary:	When a P-CSCF receives SIP 1xx or 2xx response to a target refresh request for a dialogue destined for the UE, if the list of Via headers does not match the saved list of Via headers received in the initial request corresponding to the same dialog, either discard the response or replace the Via header values with those received in the request.					
Clause:	5.2.6.4.6 first numbered list item 1					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1, A.3/25.7.1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓			✓	UE2 has established an INVITE dialogue with UE1	
			✓		IUT has stored Via header	
	✓		✓	✓	IUT has received target refresh INVITE via Mw originated by UE2 addressed to UE1	
	✓		✓		IUT has sent target refresh INVITE to UE1	
	UE1	**IMS**	**IUT**	**UE2**		

Step	Direction				Message	IF
1					**200 response** ✓ Via header not matching stored Via header	**Gm**
2a					**200 response**	**Mw**
2b					**200 response** ✓ Via header ➔ stored Via header	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_TAR_07**					
Summary:	When a P-CSCF receives SIP 1xx or 2xx response to a target refresh request for a dialogue destined for the UE, if a security association exists, rewrite the address and port number of its own Record-Route entry to the same value as for the response to the initial request for the dialogue and remove the comp parameter and updated access-network-charging-info parameter shall be included in the P-Charging-Vector header field.					
Clause:	5.2.6.4.6 first numbered list item 2; 5.2.9.2 paragraph 2					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
	✓		✓		UE1 has established a security association with IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓			✓	UE2 has established an INVITE dialogue with UE1	
			✓		IUT has stored Record-Route header	
	✓		✓	✓	IUT has received target refresh INVITE via Mw originated by UE2 addressed to UE1	
	✓		✓		IUT has sent target refresh INVITE to UE1	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	→		→		**200 response**	**Gm**
2		←	←		**200 response** ✓ Record-Route header ➔ stored Record-Route header ✓ P-Charging-Vector header ✓ updated access-network-charging-info parameter	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_TAR_07A**					
Summary:	When a P-CSCF receives SIP 1xx or 2xx response to a target refresh request for a dialogue destined for the UE, if a digest without TLS exists, updated access-network-charging-info parameter shall be included in the P-Charging-Vector header field.					
Clause:	5.2.6.4.6 first numbered list item 2; 5.2.9.2 paragraph 2					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓			✓	UE2 has established an INVITE dialogue with UE1	
			✓		IUT has stored Record-Route header	
	✓		✓	✓	IUT has received target refresh INVITE via Mw originated by UE2 addressed to UE1	
	✓		✓		IUT has sent target refresh INVITE to UE1	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	↳		↱		**200 response**	**Gm**
2		↰	↲		**200 response** ✓ P-Charging-Vector header ✓ updated access-network-charging-info parameter	**Mw**

Test Purpose				
Identifier:	**TP_IMST2_MW_TAR_08**			
Summary:	When a P-CSCF receives any response other than the SIP 1xx or 2xx response to a target refresh request for a dialogue destined for the UE, if the list of Via headers does not match the saved list of Via headers received in the initial request corresponding to the same dialog, either discard the response or replace the Via header values with those received in the request.			
Clause:	5.2.6.4.6 second numbered list item 1			
References:	-	**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1, A.3/25.8.1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓			✓	UE2 has established an INVITE dialogue with UE1	
			✓		IUT has stored Via header	
	✓		✓	✓	IUT has received target refresh INVITE via Mw originated by UE2 addressed to UE1	
	✓		✓		IUT has sent target refresh INVITE to UE1	
	UE1	**IMS**	**IUT**	**UE2**		

Step	Direction				Message	IF
1					**4xx response** ✓ Via header not matching stored Via header	**Gm**
2a					**4xx response**	**Mw**
2b					**4xx response** ✓ Via header ➔ stored Via header	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_TAR_09**					
Summary:	When a P-CSCF receives any response other than the SIP 1xx or 2xx response to a target refresh request for a dialogue destined for a UE, if a security association exists, rewrite the address and port number of its own Record-Route entry to the IP address and the port number where it awaits subsequent requests from the calling party and remove the comp parameter.					
Clause:	5.2.6.4.6 second numbered list item 2					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	

	Entities				Condition	
	UE1	**IMS**	**IUT**	**UE2**		
			×		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
	✓		✓		UE1 has established a security association with IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓			✓	UE2 has established an INVITE dialogue with UE1	
	✓		✓	✓	IUT has received target refresh INVITE via Mw originated by UE2 addressed to UE1	
	✓		✓		IUT has sent target refresh INVITE to UE1	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	→		←		**4xx response**	**Gm**
2		←	→		**4xx response** ✓ Record-Route header ➔ IP address of IUT P-CSCF ➔ port number of IUT P-CSCF × comp parameter	**Mw**

Test Purpose						
Identifier:	**TP_IMST2_MW_TAR_09A**					
Summary:	When a P-CSCF receives any response other than the SIP 1xx or 2xx response to a target refresh request for a dialogue destined for a UE, if digest without TLS exists, forward the response.					
Clause:	5.2.6.4.6 second numbered list					
References:	-			**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/1**	
	Entities				**Condition**	
	UE1	**IMS**	**IUT**	**UE2**		
			✗		IUT not configured for topology hiding	
	✓		✓		UE1 registered in IUT	
		✓		✓	UE2 registered in IMS	
		✓	✓		IUT configured with an entry point to IMS	
	✓			✓	UE2 has established an INVITE dialogue with UE1	
	✓		✓	✓	IUT has received target refresh INVITE via Mw originated by UE2 addressed to UE1	
	✓		✓		IUT has sent target refresh INVITE to UE1	
	UE1	**IMS**	**IUT**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	→		→		**4xx response**	**Gm**
2		←	←		**4xx response**	**Mw**

6.2.7 Emergency procedures

Test Purpose			
Identifier:	**TP_IMST2_MW_EME_01**		
Summary:	When P-CSCF receives from an unregistered user an initial request other than a SIP REGISTER for a dialogue and the Request-URI contained in the request matches one of the emergency service identifiers, it shall insert an emergency service URN into the Request-URI field and select an E-CSCF and add the URI of the selected E-CSCF to the topmost Route header and continue with normal initial SIP request process procedure.		
Clause:	5.2.10.2 paragraph 1; 5.2.7.2 paragraph 3		
References:	-	**Config Ref:**	CF_1Mw1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1**

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
	×		×	UE1 not registered in IUT	
		✓	✓	IUT configured with an entry point to IMS	
			✓	IUT configured for emergency sessions	
	UE1	**IMS**	**IUT**		

Step	Direction			Message	IF
1	→		→	**INVITE** ✓ Request-URI matching an emergency service identifier	
2		→	→	**INVITE** ✓ Request URI ➔ emergency service URN ✓ Route header ✓ topmost SIP URI of IUT E-CSCF	**Mw**
3	←		←	**100 response**	**Gm**

Test Purpose			
Identifier:	**TP_IMST2_MW_EME_02**		
Summary:	When P-CSCF receives from an unregistered user an initial request other than a SIP REGISTER for a dialogue and the Request-URI contained in the request matches one of the emergency service identifiers, it shall insert an emergency service URN into the Request-URI field and select an E-CSCF and add the URI of the selected E-CSCF to the topmost Route header and continue with normal initial SIP request process procedure but without removing the P-Preferred-Identity header and inserting a P-Asserted-Identity header.		
Clause:	5.2.10.2 item 1,2,3,3A; 5.2.7.2 paragraph 3		
References:	-	**Config Ref:**	CF_1Mw1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1**

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
	×		×	UE1 not registered in IUT	
		✓	✓	IUT configured with an entry point to IMS	
			✓	IUT configured for emergency sessions	
	UE1	**IMS**	**IUT**		
Step	**Direction**			**Message**	**IF**
1	→		→	**INVITE** ✓ P-Preferred-Identity header	
2		→	→	**INVITE** ✓ P-Preferred-Identity header × P-Asserted-Identity header ✓ Request-URI ➔ emergency service URN ✓ Route header ✓ topmost SIP URI of IUT E-CSCF ✓ P-Charging-Vector header ✓ icid parameter	**Mw**
3	←		←	**100 response**	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_MW_EME_03**				
Summary:	When a P-CSCF receives from a UE, that has previously registered specifically for emergency service, an initial request that is not a SIP REGISTER request, and the Request-URI contained in the request matches one of the emergency service identifiers, the P-CSCF shall include an emergency service URN in the Request-URI.				
Clause:	5.2.10.3 item 1; 5.2.7.2 paragraph 3				
References:	-		**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
	✓		✓	UE1 registered for emergency service in IUT	
		✓	✓	IUT configured with an entry point to IMS	
			✓	IUT configured for emergency sessions	
	UE1	**IMS**	**IUT**		
Step	**Direction**			**Message**	**IF**
1				**INVITE** ✓ Request-URI matching an emergency service identifier	
2				**INVITE** ✓ Request-URI ➔ emergency service URN	**Mw**
3				**100 response**	**Gm**

Test Purpose			
Identifier:	**TP_IMST2_MW_EME_04**		
Summary:	When a P-CSCF receives from a UE, that has previously registered specifically for emergency service, an initial request that is not a SIP REGISTER request, and the Request-URI contained in the request matches one of the emergency service identifiers the P-CSCF shall include an emergency service URN in the Request-URI and if the P-Preferred-Identity header is present and carries the registered emergency public user identity, remove that header and insert a P-Asserted-Identity header with the registered emergency public user identity a second P-Asserted-Identity header with the tel-URI associated with the registered emergency public user identity.		
Clause:	5.2.10.3 item 1,1C)i) ; 5.2.7.2 paragraph 3		
References:	-	**Config Ref:**	CF_1Mw1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1**

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
	✓		✓	UE1 registered for emergency service in IUT	
			✓	IUT has stored display name	
		✓	✓	IUT configured with an entry point to IMS	
			✓	IUT configured for emergency sessions	
	UE1	**IMS**	**IUT**		
Step	**Direction**			**Message**	**IF**
1	→		→	**INVITE** ✓ Request-URI matching an emergency service identifier ✓ P-Preferred-Identity header ✓ emergency public user identity	
2		←	←	**INVITE** × P-Preferred-Identity header ✓ P-Asserted-Identity header ✓ emergency public user identity ✓ second P-Asserted-Identity header ✓ tel URI of emergency public user identity ✓ Request-URI ➔ emergency service URN	**Mw**
3	←		←	**100 response**	**Gm**

Test Purpose			
Identifier:	**TP_IMST2_MW_EME_05**		
Summary:	When a P-CSCF receives from a UE, that has previously registered specifically for emergency service, an initial request that is not a SIP REGISTER request, and the Request-URI contained in the request matches one of the emergency service identifiers, the P-CSCF shall include an emergency service URN in the Request-URI and if the P-Preferred-Identity header is present and carries the tel-URI associated with the registered emergency public user identity, remove that header and insert a P-Asserted-Identity header with the tel-URI associated with the registered emergency public user identity and a second P-Asserted-Identity header with the registered emergency public user identity.		
Clause:	5.2.10.3 item 1,1C)ii) ; 5.2.7.2 paragraph 3		
References:	-	**Config Ref:**	CF_1Mw1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1**

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
	✓		✓	UE1 registered for emergency service in IUT	
			✓	IUT has stored display name	
		✓	✓	IUT configured with an entry point to IMS	
			✓	IUT configured for emergency sessions	
	UE1	**IMS**	**IUT**		

Step	Direction			Message	IF
1	→			**INVITE** ✓ Request-URI matching an emergency service identifier ✓ P-Preferred-Identity header ✓ tel URI of emergency public user identity	
2		→	→	**INVITE** × P-Preferred-Identity header ✓ P-Asserted-Identity header ✓ emergency public user identity ✓ second P-Asserted-Identity header ✓ tel URI of emergency public user identity ✓ Request-URI ➔ emergency service URN	**Mw**
3	←		←	**100 response**	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_MW_EME_06**				
Summary:	When a P-CSCF receives target refresh request for an emergency dialogue with the Request-URI containing GRUU, it shall obtain the UE IP address and UE protected server port related to the GRUU contained in the Request-URI and rewrite the Request-URI with that UE IP address and UE protected server port.				
Clause:	5.2.10.3 last dashed list; 5.2.6.4.5 item 2,4				
References:	-		**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
	✓		✓	UE1 registered for emergency service in IUT	
		✓	✓	IUT configured with an entry point to IMS	
			✓	IUT configured for emergency sessions	
	✓			UE1 has established an emergency session	
	UE1	**IMS**	**IUT**		
Step	**Direction**			**Message**	**IF**
1	→		→	**target refresh INVITE** ✓ Request-URI ✓ GRUU	**Gm**
2		→	→	**INVITE** ✓ Request-URI ✓ UE1 IP address protected server port number ✓ Via header ✓ port number of IUT P-CSCF ✓ as topmost the address of IUT P-CSCF ✓ Record-Route header ➔ as topmost the SIP URI of IUT P-CSCF	**Mw**

Test Purpose					
Identifier:	**TP_IMST2_MW_EME_07**				
Summary:	When a P-CSCF receives from a UE that has registered for non-emergency service an initial request that is not a SIP REGISTER request, and the Request-URI contained in the request matches one of the emergency service identifiers, the P-CSCF shall include an emergency service URN in the Request-URI field.				
Clause:	5.2.10.4 item 1; 5.2.7.2 paragraph 3				
References:	-		**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
	✓		✓	UE1 registered in IUT	
			✓	IUT has stored display name	
		✓	✓	IUT configured with an entry point to IMS	
			✓	IUT configured for emergency sessions	
	UE1	**IMS**	**IUT**		
Step	**Direction**			**Message**	**IF**
1	→		→	**INVITE** ✓ Request-URI matching an emergency service identifier	
2		←	←	**INVITE** ✓ Request-URI ➔ emergency service URN	**Mw**
3	←		←	**100 response**	**Gm**

Test Purpose			
Identifier:	**TP_IMST2_MW_EME_08**		
Summary:	When a P-CSCF receives from a UE that has registered for non-emergency service an initial request that is not a SIP REGISTER request, and the Request-URI contained in the request matches one of the emergency service identifiers, if the public user identity included in the P-Preferred-Identity header matches one of the P-CSCFs registered public user identities remove the P-Preferred-Identity header from the received request, insert a P-Asserted-Identity header that includes the public user identity that was present in the P-Preferred-Identity header and add a second P-Asserted identity header that contains the tel URI associated with the public user identity.		
Clause:	5.2.10.4 item 1C)i)		
References:	-	**Config Ref:**	CF_1Mw1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1**

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
	✓		✓	UE1 registered in IUT	
			✓	IUT has stored display name	
		✓	✓	IUT configured with an entry point to IMS	
			✓	IUT configured for emergency sessions	
	UE1	**IMS**	**IUT**		

Step	Direction			Message	IF
1	→		→	**INVITE** ✓ Request-URI ✓ emergency service URN ✓ P-Preferred-Identity header ✓ registered public user identity	**Gm**
2		→	→	**INVITE** × P-Preferred-Identity header ✓ P-Asserted-Identity header ✓ registered public user identity ✓ second P-Asserted-Identity header ✓ tel URI of public user identity	**Mw**

Test Purpose			
Identifier:	**TP_IMST2_MW_EME_09**		
Summary:	When a P-CSCF receives from a UE that has registered for non-emergency service an initial request that is not a SIP REGISTER request, and the Request-URI contained in the request matches one of the emergency service identifiers, if the tel URI associated with one of the registered public user identities is included in the P-Preferred-Identity header remove the P-Preferred-Identity header, insert a P-Asserted-Identity header that includes the tel URI that was present in the P-Preferred-Identity header and add a second P-Asserted-Identity header that contains a public user identity.		
Clause:	5.2.10.4 item 1C)ii)		
References:	-	**Config Ref:**	CF_1Mw1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1**

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
	✓		✓	UE1 registered in IUT	
			✓	IUT has stored display name	
		✓	✓	IUT configured with an entry point to IMS	
			✓	IUT configured for emergency sessions	
	UE1	**IMS**	**IUT**		
Step	**Direction**			**Message**	**IF**
1	→		→	**INVITE** ✓ Request-URI ✓ emergency service URN ✓ P-Preferred-Identity header ✓ tel URI of public user identity	**Gm**
2		→	→	**INVITE** × P-Preferred-Identity header ✓ P-Asserted-Identity header ✓ tel URI of public user identity ✓ second P-Asserted-Identity header ✓ registered public user identity	**Mw**

Test Purpose					
Identifier:	**TP_IMST2_MW_EME_10**				
Summary:	When a P-CSCF receives for a user registered for non-emergency services a target refresh request for an emergency dialogue with the Request-URI containing GRUU, it shall obtain the UE IP address and UE protected server port related to the GRUU contained in the Request-URI and rewrite the Request-URI with that UE IP address and UE protected server port.				
Clause:	5.2.10.4 last dashed list; 5.2.6.4.5 item 2,4				
References:	-		**Config Ref:**	CF_1Mw1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
	✓		✓	UE1 registered in IUT	
		✓	✓	IUT configured with an entry point to IMS	
			✓	IUT configured for emergency sessions	
	✓			UE1 has established an emergency session	
	UE1	**IMS**	**IUT**		

Step	Direction			Message	IF
1	→		⇢	**target refresh INVITE** ✓ Request-URI ✓ GRUU	**Gm**
2		←	⇠	**INVITE** ✓ Request-URI ✓ UE1 IP address protected server port number ✓ Via header ✓ port number of IUT P-CSCF ✓ as topmost the address of IUT P-CSCF ✓ Record-Route header ➔ as topmost the SIP URI of IUT P-CSCF	**Mw**

Test Purpose					
Identifier:	**TP_IMST2_MW_EME_11**				
Summary:	A P-CSCF shall respond to a SIP INVITE request for an emergency session with a SIP 380 response if it is not capable of or not configured to handle the requested emergency sessions.				
Clause:	5.2.10.5 I)				
References:	-		**Config Ref:**	CF_1Mw	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
	✓		✓	UE1 registered in IUT	
		✓	✓	IUT configured with an entry point to IMS	
	✓	✓		UE1 visiting IMS	
			×	IUT not configured for emergency sessions	
	UE1	**IMS**	**IUT**		

Step	Direction			Message	IF
1		→	→	**INVITE** ✓ Request-URI ✓ emergency service URN	**Mw**
2		←	←	**380 response** to UE1	**Mw**

6.2.8 SDP procedures

Test Purpose					
Identifier:	**TP_IMST2_MW_SDP_01**				
Summary:	When an S-CSCF receives a SIP request containing a SDP offer in which there are media parameters which are not permitted by local policy or by user subscription, it shall send a SIP 488 (Not Acceptable Here) response containing a SDP payload which contains all or an acceptable subset, of the media types, codecs and other SDP parameters permitted by local policy or user subscription.				
Clause:	6.3 paragraph 1				
References:	-		**Config Ref:**	CF_1Mw	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
	✓		✓	UE1 registered in IUT	
	✓	✓		UE1 visiting IMS	
		✓	✓	IUT configured with an entry point to IMS	
	UE1	**IMS**	**IUT**		

Step	Direction			Message	IF
1		→	→	**INVITE** to UE1 ✓ SDP offer ✓ unacceptable media parameter	**Mw**
2		←	←	**488 response** ✓ SDP offer	**Mw**

Test Purpose					
Identifier:	**TP_IMST2_MW_SDP_02**				
Summary:	When an S-CSCF receives a SIP request containing an encrypted SDP offer, it may reject the request.				
Clause:	6.3 paragraph 1				
References:	-		**Config Ref:**	CF_1Mw	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/3, A.6/34.1.1**	

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
	✓		✓	UE1 registered in IUT	
		✓	✓	IUT configured with an entry point to IMS	
	✓	✓		UE1 visiting IMS	
			✓	IUT configured to reject encrypted SDP offers	
	UE1	**IMS**	**IUT**		

Step	Direction			Message	IF
1		→	→	**INVITE** to UE1 ✓ encrypted SDP offer	**Mw**
2		←	←	**4xx response**	**Mw**
3	←‖		‖→	**INVITE**	**Gm**

Test Purpose					
Identifier:	**TP_IMST2_MW_SDP_03**				
Summary:	When an P-CSCF receives a SIP request containing a SDP answer to a SDP offer which was contained in a previously forwarded SIP response, other than a SIP 200 (OK), the P-CSCF shall not examine the media parameters in the received SDP offer.				
Clause:	6.2 paragraph 2				
References:	-		**Config Ref:**	CF_1Gm1Mw	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/1**	

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			✗	IUT not configured for topology hiding	
	✓		✓	UE1 registered in IUT	
	✓		✓	IUT has received INVITE via Mw for UE1	
			✓	IUT has sent INVITE via Gm	
		✓	✓	IUT configured with an entry point to IMS	
	UE1	**IMS**	**IUT**		

Step	Direction			Message	IF
1		→	→	**180 response** to UE1 ✓ SDP offer ✓ unacceptable media parameter	**Mw**
2		→||	||→	**4xx response**	**Mw**
3	→		→	**180 response**	**Gm**

Test Purpose			
Identifier:	**TP_IMST2_MW_SDP_04**		
Summary:	When a P-CSCF receives a SIP ACK request containing an SDP answer in response to a SDP offer which was previously forwarded in a SIP 200 (OK) response and which contained media parameters not permitted by local policy, it shall terminate the session.		
Clause:	6.2 paragraph 3		
References:	-	**Config Ref:**	CF_1Gm1Mw
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1**

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
	✓		✓	UE1 registered in IUT	
	✓		✓	IUT has received INVITE via Mw for UE1	
	✓		✓	IUT has sent INVITE via Gm to UE1	
		✓	✓	IUT configured with an entry point to IMS	
	UE1	**IMS**	**IUT**		

Step	Direction			Message	IF
1	↘		↗	**200 response** ✓ SDP offer ✓ unacceptable media parameter	**Gm**
2		←	↙	**200 response**	**Mw**
3		↘	↗	**ACK** ✓ SDP answer	**Mw**
4		←	↙	**BYE**	**Mw**
5	←		↙	**BYE**	**Gm**

Test Purpose			
Identifier:	**TP_IMST2_MW_SDP_05**		
Summary:	When a P-CSCF receives a SIP ACK request containing an SDP answer in response to an encrypted SDP offer which was previously forwarded in a SIP 200 (OK) response, it may terminate the session.		
Clause:	6.2 paragraph 3		
References:	-	**Config Ref:**	CF_1Gm1Mw
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/1, A.3/30.3.1**

	Entities			Condition	
	UE1	**IMS**	**IUT**		
			×	IUT not configured for topology hiding	
	✓		✓	UE1 registered in IUT	
	✓		✓	IUT has received INVITE via Mw for UE1	
	✓		✓	IUT has sent INVITE via Gm to UE1	
		✓	✓	IUT configured with an entry point to IMS	
			✓	IUT configured to reject encrypted SDP offers	
	UE1	**IMS**	**IUT**		

Step	Direction			Message	IF
1	↘		↗	**200 response** ✓ encrypted SDP offer	**Gm**
2		←	↙	**200 response**	**Mw**
3		↘	↗	**ACK** ✓ encrypted SDP answer	**Mw**
4		←	↙	**BYE**	**Mw**
5	←		↙	**BYE**	**Gm**

6.3 Test purposes for the Ic interface

6.3.1 General

Test Purpose					
Identifier:	**TP_IMST2_IC_GEN_01**				
Summary:	When an IBCF receives SIP REGISTER request from within its own network, it shall add its own routable SIP URI to the top of the Path header.				
Clause:	5.10.2.1 1) and 2), 5.10.4.1				
References:				**Config Ref:**	CF_1Ic1Gm
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/4**

	Entities			Condition	
	UE1	**IUT**	**IMS**		
		✓		IUT configured for topology hiding	
		✓		IUT configured with one entry point to home network	
	UE1	**IUT**	**IMS**		
Step	**Direction**			**Message**	**IF**
1	↳	↱		**REGISTER**	
2		↳	↱	**REGISTER** ✓ topmost Path header ➔ SIP URI of IUT IBCF	**Ic1**

6.3.2 Registration procedures

Test Purpose					
Identifier:	**TP_IMST2_IC_REG_01**				
Summary:	When an IBCF receives a SIP 3xx (Redirection) response from a home network entry point to a previously forwarded SIP REGISTER request, it shall resend the Register request to another home network entry point to which it has not previously forwarded the same request.				
Clause:	5.10.2.1 3) second dash				
References:	-			**Config Ref:**	CF_2Ic1Gm
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/4**

	Entities			Condition	
	UE1	**IUT**	**IMS**		
		✓		IUT configured for topology hiding	
		✓		IUT configured with two entry points to home network	
	✓	✓		IUT has received REGISTER from UE1	
		✓		IUT has sent REGISTER via Ic1	
	UE1	**IUT**	**IMS**		

Step	Direction			Message	IF
1		⇦	⇦	**3xx response**	**Ic1**
2		⇨	⇨	**REGISTER**	**Ic2**

Test Purpose					
Identifier:	**TP_IMST2_IC_REG_02**				
Summary:	When an IBCF receives SIP 480 (Temporarily Unavailable) response from a home network entry point to a previously forwarded SIP REGISTER request, it shall forward the Register request to another home network entry point to which it has not previously forwarded the same request.				
Clause:	5.10.2.1 3) second dash				
References:	-			**Config Ref:**	CF_2Ic1Gm
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/4**

	Entities			Condition	
	UE1	**IUT**	**IMS**		
		✓		IUT configured for topology hiding	
		✓		IUT configured with two entry points to home network	
	✓	✓		IUT has received REGISTER from UE1	
		✓		IUT has sent REGISTER via Ic1	
	UE1	**IUT**	**IMS**		

Step	Direction			Message	IF
1		⇦	⇦	**480 response**	**Ic1**
2		⇨	⇨	**REGISTER**	**Ic2**

Test Purpose					
Identifier:	**TP_IMST2_IC_REG_03**				
Summary:	When ran IBCF receives no response from a home network entry point to a previously forwaded SIP REGISTER request, it shall forward the Register request to another home network entry point to which it has not previously forwarded the same request.				
Clause:	5.10.2.1 3) first dash				
References:	-		**Config Ref:**	CF_2Ic1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/4**	
	Entities			**Condition**	
	UE1	**IUT**	**IMS**		
		✓		IUT configured for topology hiding	
		✓		IUT configured with two entry points to home network	
	✓	✓		IUT has received REGISTER from UE1	
		✓		IUT has sent REGISTER via Ic1	
	UE1	**IUT**	**IMS**		
Step	**Direction**			**Message**	**IF**
1				**no response**	**Ic1**
2				**REGISTER**	**Ic2**

Test Purpose					
Identifier:	**TP_IMST2_IC_REG_04**				
Summary:	If an IBCF receives a SIP 3xx (Redirection) response to a SIP REGISTER request from all entry points in the registering user s home network, it shall send a SIP 504 (Server Time-Out) response to the P-CSCF.				
Clause:	5.10.2.1 3) second dash				
References:	-		**Config Ref:**	CF_1Ic1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/4**	
	Entities			**Condition**	
	UE1	**IUT**	**IMS**		
		✓		IUT configured for topology hiding	
		✓		IUT configured with one entry point to home network	
	✓	✓		IUT has received REGISTER from UE1	
	UE1	**IUT**	**IMS**		
Step	**Direction**			**Message**	**IF**
1				**3xx response**	**Ic1**
2a				**408 response**	
2b				**504 response**	

Test Purpose			
Identifier:	**TP_IMST2_IC_REG_05**		
Summary:	If an IBCF receives a SIP 480 (Temporarily Unavailable) response to a SIP REGISTER request from all entry points in the registering user s home network, it shall send a SIP 504 (Server Time-Out) response to the P-CSCF.		
Clause:	5.10.2.1 3) second dash		
References:	-	**Config Ref:**	CF_1Ic1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/4**

	Entities			Condition	
	UE1	**IUT**	**IMS**		
		✓		IUT configured for topology hiding	
		✓		IUT configured with one entry point to home network	
	✓	✓		IUT has received REGISTER from UE1	
	UE1	**IUT**	**IMS**		
Step	**Direction**			**Message**	**IF**
1		→	←	**480 response**	**Ic1**
2a	←	←		**408 response**	
2b	←	←		**504 response**	

Test Purpose			
Identifier:	**TP_IMST2_IC_REG_06**		
Summary:	If an IBCF receives no response to a SIP REGISTER request from all entry points in the registering user s home network, it shall send a SIP 504 (Server Time-Out) response to the P-CSCF.		
Clause:	5.10.2.1 3) first dash		
References:	-	**Config Ref:**	CF_1Ic1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/4**

	Entities			Condition	
	UE1	**IUT**	**IMS**		
		✓		IUT configured for topology hiding	
		✓		IUT configured with one entry point to home network	
	✓	✓		IUT has received REGISTER from UE1	
	UE1	**IUT**	**IMS**		
Step	**Direction**			**Message**	**IF**
1		→‖	‖←	**no response**	**Ic1**
2a	←	←		**408 response**	
2b	←	←		**504 response**	

Test Purpose					
Identifier:	**TP_IMST2_IC_REG_07**				
Summary:	When an IBCF receives a SIP REGISTER request from an non-trusted domain outside its own network, it shall send a SIP 403 (Forbidden) response to the sender of the request.				
Clause:	5.10.3.1 1)				
References:	-		**Config Ref:**	CF_1Ic	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/4**	
	Entities			**Condition**	
	UE1	**IUT**	**IMS**		
		✓	✓	IMS configured as untrusted domain for IUT	
	UE1	**IUT**	**IMS**		
Step	**Direction**			**Message**	**IF**
1		⇦	⇦	**REGISTER**	**Ic1**
2		⇨	⇨	**403 response**	**Ic1**

6.3.3 Initial request procedures

Test Purpose					
Identifier:	**TP_IMST2_IC_INI_01**				
Summary:	When an IBCF receives an initial SIP INVITE request from within its own network it encrypts all Via header URIs except the one of the IBCF prior to forwarding the request.				
Clause:	5.10.2.2 1) 3) 8), 5.10.4				
References:	-		**Config Ref:**	CF_1Ic1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/4**	
	Entities			**Condition**	
	UE1	**IUT**	**IMS**		
		✓		IUT configured for topology hiding	
	✓	✓		UE1 registered in IUT	
	UE1	**IUT**	**IMS**		
Step	**Direction**			**Message**	**IF**
1	⇨	⇨		**INVITE**	
2	⇦	⇦		**100 response**	
3		⇨	⇨	**INVITE** ✓ topmost Via header ➔ SIP URI of IUT IBCF ✓ encrypted SIP URI ➔ tokenized-by parameter ✖ P-Charging-Function-Addresses header	**Ic1**

Test Purpose					
Identifier:	**TP_IMST2_IC_INI_02**				
Summary:	When an IBCF receives a 180 response to a forwarded initial INVITE request and network topology hiding is required it shall not encrypt Via header URIs when forwarding to the UE.				
Clause:	5.10.2.2, 5.10.4				
References:	-		**Config Ref:**	CF_1Ic1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/4**	
	Entities			**Condition**	
	UE1	**IUT**	**IMS**		
		✓		IUT configured for topology hiding	
	✓	✓		IUT has received INVITE from UE1	
		✓		IUT has sent INVITE via Ic1	
	UE1	**IUT**	**IMS**		
Step	**Direction**			**Message**	**IF**
1		⇦	⇦	**180 response**	**Ic1**
2	⇦	⇦		**180 response** × any header ✓ encrypted SIP URI ➔ tokenized-by parameter	

Test Purpose					
Identifier:	**TP_IMST2_IC_INI_03**				
Summary:	When an IBCF receives a 200 response to a forwarded initial INVITE request and network topology hiding is required it shall not encrypt Via header URIs when forwarding to the UE.				
Clause:	5.10.2.2, 5.10.4				
References:	-		**Config Ref:**	CF_1Ic1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/4**	
	Entities			**Condition**	
	UE1	**IUT**	**IMS**		
		✓		IUT configured for topology hiding	
	✓	✓		IUT has received INVITE from UE1	
		✓		IUT has sent INVITE via Ic1	
	UE1	**IUT**	**IMS**		
Step	**Direction**			**Message**	**IF**
1		⇦	⇦	**200 response**	**Ic1**
2	⇦	⇦		**200 response** × any header ✓ encrypted SIP URI ➔ tokenized-by parameter	

Test Purpose			
Identifier:	**TP_IMST2_IC_INI_04**		
Summary:	When an IBCF receives any SIP request, other than a SIP REGISTER request, from a non-trusted domain and the topmost Route header in the request contains the orig parameter, the IBCF shall send a SIP 403 (Forbidden) response to the originator of the request.		
Clause:	5.10.3.2, second dashed list, second dash		
References:	-	**Config Ref:**	CF_1Ic
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/4**

	Entities		Condition	
	IUT	**IMS**		
	✓	✓	IMS configured as untrusted domain for IUT	
	IUT	**IMS**		

Step	Direction		Message	IF
1	⇦	⇩	**INVITE** ✓ topmost Route header ✓ orig parameter	**Ic1**
2	⇨	⇧	**403 response**	**Ic1**

Test Purpose			
Identifier:	**TP_IMST2_IC_INI_05**		
Summary:	When an IBCF receives a SIP INVITE request from a trusted domain outside its own network, it shall return a SIP 100 response and not encrypt Via header URIs when forwarding to the UE.		
Clause:	5.10.3.2 1) 3), 5.10.4		
References:	-	**Config Ref:**	CF_1Ic1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/4**

	Entities			Condition	
	UE1	**IUT**	**IMS**		
		✓		IUT configured for topology hiding	
		✓	✓	IMS configured as trusted domain for IUT	
	UE1	**IUT**	**IMS**		

Step	Direction			Message	IF
1		⇦	⇩	**INVITE** ✓ Via header ✓ topmost SIP URI of IMS ✓ encrypted SIP URI ➔ tokenized-by parameter	**Ic1**
2		⇨	⇧	**100 response**	**Ic1**
3	⇦	⇩		**INVITE** ✖ any header ✓ encrypted SIP URI ➔ tokenized-by parameter	

Test Purpose					
Identifier:	**TP_IMST2_IC_INI_06**				
Summary:	When the IBCF receives an INVITE request and the IBCF requires the periodic refreshment of the session it shall add a Session-Expires prior to forwarding it to the UE.				
Clause:	5.10.3.2, RFC 4028 [8]				
References:	-		**Config Ref:**	CF_1Ic1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/4, A.8/10.3.1**	

	Entities			Condition	
	UE1	**IUT**	**IMS**		
		✓		IUT configured for requiring periodic refreshment	
	UE1	**IUT**	**IMS**		
Step	**Direction**			**Message**	**IF**
1		→	→	**INVITE**	**Ic1**
2	→	→		**INVITE** ✓ Session-Expires header	

Test Purpose					
Identifier:	**TP_IMST2_IC_INI_07**				
Summary:	When an IBCF receives a valid 180 response from within its own network it shall remove the P-Charging-Function-Addresses header and add its own URI as the topmost Via header and encrypt all other Via header prior to forwarding the response to other networks.				
Clause:	5.10.3.2 second numbered list, 5.10.4				
References:	-		**Config Ref:**	CF_1Ic1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/4**	

	Entities			Condition	
	UE1	**IUT**	**IMS**		
		✓		IUT configured for topology hiding	
		✓		IUT has received INVITE via Ic1	
	✓	✓		IUT has sent INVITE to UE1	
	UE1	**IUT**	**IMS**		
Step	**Direction**			**Message**	**IF**
1	←	←		**180 response**	
2		←	←	**180 response** ✓ topmost Via header ➔ SIP URI of IUT IBCF ✓ encrypted SIP URI ➔ tokenized-by parameter ✗ P-Charging-Function-Addresses header	**Ic1**

Test Purpose					
Identifier:	**TP_IMST2_IC_INI_08**				
Summary:	When an IBCF receives a valid 200 response from within its own network it shall remove the P-Charging-Function-Addresses header and add its own URI as the topmost Via header and encrypt all other Via header prior to forwarding the response to other networks.				
Clause:	5.10.3.2, second numbered list, 5.10.4				
References:	-		**Config Ref:**	CF_1Ic1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/4**	

	Entities			Condition	
	UE1	**IUT**	**IMS**		
		✓		IUT configured for topology hiding	
		✓		IUT has received INVITE via Ic1	
	✓	✓		IUT has sent INVITE to UE1	
	UE1	**IUT**	**IMS**		
Step	**Direction**			**Message**	**IF**
1	↳	↱		**200 response**	
2		↳	↱	**200 response** ✓ topmost Via header ➔ SIP URI of IUT IBCF ✓ encrypted SIP URI ➔ tokenized-by parameter ✖ P-Charging-Function-Addresses header	**Ic1**

Test Purpose			
Identifier:	**TP_IMST2_IC_INI_09**		
Summary:	When an IBCF processes a SIP request or response that contains a contact address which is a Globally Routable User agent URI (GRUU), it shall replace the contact address with an address which is also a GRUU.		
Clause:	5.10.5, paragraph 4		
References:	-	**Config Ref:**	CF_1Ic1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/4**

	Entities			Condition	
	UE1	**IUT**	**IMS**		
		✓		IUT has received INVITE via Ic1 containing Contact header indicating GRUU	
	✓	✓		IUT has sent INVITE to UE1 containing Contact header indicating GRUU	
				configured for IMS-ALG	
	UE1	**IUT**	**IMS**		
Step	**Direction**			**Message**	**IF**
1				**200 response**	
2				**200 response** ✓ Contact header ➔ GRUU	**Ic1**

6.3.4 Standalone requests procedures

Test Purpose					
Identifier:	**TP_IMST2_IC_STA_01**				
Summary:	When an IBCF receives an initial SIP request other than a SIP REGISTER or SIP INVITE from within its own network, it shall add its own URI as the topmost Via header and encrypt all other Via header and exclude charging related headers prior to forwarding the request to other networks.				
Clause:	5.10.2.2 3) 8), 5.10.4				
References:	-		**Config Ref:**	CF_1Ic1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/4**	

	Entities			Condition	
	UE1	**IUT**	**IMS**		
		✓		IUT configured for topology hiding	
	✓	✓		UE1 registered in IUT	
	UE1	**IUT**	**IMS**		
Step	**Direction**			**Message**	**IF**
1	↘	↗		**MESSAGE**	
2		↘	↗	MESSAGE ✓ topmost Via header ➔ SIP URI of IUT IBCF ✓ encrypted SIP URI ➔ tokenized-by parameter ✗ P-Charging-Function-Addresses header	**Ic1**

Test Purpose					
Identifier:	**TP_IMST2_IC_STA_02**				
Summary:	When the IBCF receives an INVITE request and the IBCF requires the periodic refreshment of the session it shall add a Session-Expires prior to forwarding it to other networks.				
Clause:	5.10.2.2, RFC 4028 [8]				
References:	-		**Config Ref:**	CF_1Ic1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/4, A.8/9.3.1**	

	Entities			Condition	
	UE1	**IUT**	**IMS**		
		✓		IUT configured for topology hiding	
		✓		IUT configured for requiring periodic refreshment	
	✓	✓		UE1 registered in IUT	
	UE1	**IUT**	**IMS**		
Step	**Direction**			**Message**	**IF**
1	↘	↗		**INVITE**	
2		↘	↗	**INVITE** ✓ Session-Expires header	**Ic1**

Test Purpose			
Identifier:	**TP_IMST2_IC_STA_03**		
Summary:	When an IBCF receives a SIP request, other than a SIP REGISTER request or a SIP INVITE request, from a trusted domain outside its own network it shall decrypt all encrypted Via headers prior to forwarding the request to the UE.		
Clause:	5.10.3.2 3), 5.10.4		
References:	-	**Config Ref:**	CF_1Ic1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/4**

	Entities			Condition	
	UE1	**IUT**	**IMS**		
		✓		IUT configured for topology hiding	
		✓	✓	IMS configured as trusted domain for IUT	
	UE1	**IUT**	**IMS**		
Step	**Direction**			**Message**	**IF**
1		→	←	**MESSAGE** ✓ topmost Via header ➔ SIP URI of IMS ✓ encrypted SIP URI ➔ tokenized-by parameter	**Ic1**
2	←	←		**MESSAGE** × any header ✓ encrypted SIP URI ➔ tokenized-by parameter	

Test Purpose			
Identifier:	**TP_IMST2_IC_STA_04**		
Summary:	The IBCF shall handle requests addressed to its currently valid GRUUs when received outside of the dialogue in which the GRUU was provided.		
Clause:	5.10.5		
References:	-	**Config Ref:**	CF_1Ic1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/4**

	Entities			Condition	
	UE1	**IUT**	**IMS**		
		✓		IUT configured for IMS-ALG	
	UE1	**IUT**	**IMS**		
Step	**Direction**			**Message**	**IF**
1		→	←	**MESSAGE** ✓ To header ➔ GRUU of IUT IBCF	**Ic1**
2	←	←		**MESSAGE**	

6.3.5 Subsequent requests on a dialogue procedures

Test Purpose					
Identifier:	**TP_IMST2_IC_SUB_01**				
Summary:	When an IBCF receives an SIP BYE request from within its own network and subsequent to an initial request it shall add its own URI as the topmost Via header and encrypt all other Via header prior to forwarding the request to other networks.				
Clause:	5.10.2.3 3) 4), 5.10.4				
References:	-		**Config Ref:**	CF_1Ic1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/4**	

	Entities			Condition	
	UE1	**IUT**	**IMS**		
		✓		IUT configured for topology hiding	
	✓	✓		IUT has established an INVITE dialogue for UE1	
	UE1	**IUT**	**IMS**		
Step	**Direction**			**Message**	**IF**
1	→	←		**BYE**	
2		→	←	**BYE** ✓ topmost Via header ➔ SIP URI of IUT IBCF ✓ encrypted SIP URI ➔ tokenized-by parameter	**Ic1**

Test Purpose			
Identifier:	**TP_IMST2_IC_SUB_02**		
Summary:	When an IBCF receives a response from outside its own network to a request forwarded subsequent to an initial request and network topology hiding is required is shall not encrypt any headers prior to forwarding the response to the UE.		
Clause:	5.10.2.3, 5.10.4		
References:	-	**Config Ref:**	CF_1Ic1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/4**

	Entities			Condition	
	UE1	**IUT**	**IMS**		
		✓		IUT configured for topology hiding	
	✓	✓		IUT has established an INVITE dialogue for UE1	
	✓	✓		IUT has received BYE from UE1	
		✓		IUT has sent BYE via Ic1	
	UE1	**IUT**	**IMS**		
Step	**Direction**			**Message**	**IF**
1		⇦	⇦	**200 response**	**Ic1**
2	⇦	⇦		**200 response** ✘ any header ✓ encrypted SIP URI ➔ tokenized-by parameter	

Test Purpose			
Identifier:	**TP_IMST2_IC_SUB_03**		
Summary:	When an IBCF receives a SIP MESSAGE request from outside its own network subsequent to an initial request, then it shall decrypt any headers prior to forwarding the request to the UE.		
Clause:	5.10.3.3 3) 4), 5.10.4		
References:	-	**Config Ref:**	CF_1Ic1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/4**

	Entities			Condition	
	UE1	**IUT**	**IMS**		
		✓		IUT configured for topology hiding	
	✓	✓		IUT has established an INVITE dialogue for UE1	
	UE1	**IUT**	**IMS**		
Step	**Direction**			**Message**	**IF**
1		→	←	**MESSAGE** ✓ topmost Via header ➔ SIP URI of IMS ✓ encrypted SIP URI ➔ tokenized-by parameter	**Ic1**
2	←	←		**MESSAGE** ✘ any header ✓ encrypted SIP URI ➔ tokenized-by parameter	

Test Purpose			
Identifier:	**TP_IMST2_IC_SUB_04**		
Summary:	When an IBCF receives a SIP BYE request from outside its own network subsequent to an initial request, then it shall decrypt any headers prior to forwarding the request to the UE.		
Clause:	5.10.3.3 3) 4), 5.10.4		
References:	-	**Config Ref:**	CF_1Ic1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/4**

	Entities			Condition	
	UE1	**IUT**	**IMS**		
		✓		IUT configured for topology hiding	
	✓	✓		IUT has established an INVITE dialogue for UE1	
	UE1	**IUT**	**IMS**		
Step	**Direction**			**Message**	**IF**
1		→	→	**BYE** ✓ topmost Via header ➔ SIP URI of IMS ✓ encrypted SIP URI ➔ tokenized-by parameter	**Ic1**
2	→	→		**BYE** ✗ any header ✓ encrypted SIP URI ➔ tokenized-by parameter	

Test Purpose			
Identifier:	**TP_IMST2_IC_SUB_05**		
Summary:	When an IBCF receives a SIP 200 response from within its own network to a SIP request forwarded subsequent to an initial request it shall add its own URI to the Via header and encrypt all other Via headers prior to forwarding the response to other networks.		
Clause:	5.10.3.3, 5.10.4		
References:	-	**Config Ref:**	CF_1Ic1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/4**

	Entities			Condition	
	UE1	**IUT**	**IMS**		
		✓		IUT configured for topology hiding	
	✓	✓		IUT has established an INVITE dialogue for UE1	
		✓		IUT has received BYE via Ic1	
	✓	✓		IUT has sent BYE to UE1	
	UE1	**IUT**	**IMS**		

Step	Direction			Message	IF
1	↳	↱		**200 response**	
2		↳	↱	**200 response** ✓ topmost Via header ➔ SIP URI of IUT IBCF ✓ encrypted SIP URI ➔ tokenized-by parameter	**Ic1**

6.3.6 Target refresh request procedures

Test Purpose					
Identifier:	**TP_IMST2_IC_TAR_01**				
Summary:	When an IBCF receives a target refresh request from within its own network it shall respond with a SIP 100 response, add its own URI to the Via header and encrypt all other Via headers prior to forwarding the request to other networks.				
Clause:	5.10.2.3 1) 2) 4), 5.10.4				
References:	-		**Config Ref:**	CF_1Ic1Gm	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/4**	

	Entities			Condition	
	UE1	**IUT**	**IMS**		
		✓		IUT configured for topology hiding	
	✓	✓		IUT has established an INVITE dialogue for UE1	
	UE1	**IUT**	**IMS**		
Step	**Direction**			**Message**	**IF**
1	→	←		**target refresh INVITE**	
2	←	→		**100 response**	
3		→	←	**target refresh INVITE** ✓ topmost Via header ➔ SIP URI of IUT IBCF ✓ encrypted SIP URI ➔ tokenized-by parameter	**Ic1**

Test Purpose			
Identifier:	**TP_IMST2_IC_TAR_02**		
Summary:	When an IBCF receives a target refresh request from outside its own network subsequent to an initial request it shall decrypt all headers before forwarding it to the UE.		
Clause:	5.10.3.3 1) 2) 4), 5.10.4		
References:	-	**Config Ref:**	CF_1Ic1Gm
IUT Role:	IMS	**Selection Expression:**	**PICS A.2/4**

	Entities			Condition	
	UE1	**IUT**	**IMS**		
		✓		IUT configured for topology hiding	
	✓	✓		IUT has established an INVITE dialogue for UE1	
	UE1	**IUT**	**IMS**		
Step	**Direction**			**Message**	**IF**
1		→	→	**target refresh INVITE** ✓ topmost Via header ➔ SIP URI of IMS ✓ encrypted SIP URI ➔ tokenized-by parameter	**Ic1**
2		←	←	**100 response**	**Ic1**
3	←	←		**target refresh INVITE** ✖ any header ✓ encrypted SIP URI ➔ tokenized-by parameter	

6.4 Test purposes for the ISC interface

6.4.1 General

Test Purpose						
Identifier:	**TP_IMST2_ISC_GEN_01**					
Summary:	SIP MESSAGE requests that are exchanged between the S-CSCF and any AS based on initial filter criteria shall include the type 3 inter operator identifier (IOI).					
Clause:	4.5.4, paragraph 4					
References:	-			**Config Ref:**	CF_2Gm1ISC	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/3**	
	Entities				**Condition**	
	UE1	**IUT**	**AS1**	**UE2**		
	✓	✓		✓	UE1 and UE2 registered in IUT	
		✓	✓		IUT configured with an iFC designed to contact AS1 for MESSAGE	
	UE1	**IUT**	**AS1**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	⇘	⇗			**MESSAGE**	
2		⇘	⇗		**MESSAGE** ✓ P-Charging-Vector header ✓ ioi parameter ➔ type3	**ISC**

Test Purpose						
Identifier:	**TP_IMST2_ISC_GEN_02**					
Summary:	Responses to SIP MESSAGE requests that are exchanged between the S-CSCF and any AS shall include the type 3 inter operator identifier (IOI).					
Clause:	4.5.4, paragraph 4					
References:	-			**Config Ref:**	CF_2Gm1ISC	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/3**	
	Entities				**Condition**	
	UE1	**IUT**	**AS1**	**UE2**		
	✓	✓		✓	UE1 and UE2 registered in IUT	
	✓	✓		✓	IUT has received MESSAGE from UE1 addressed to UE2	
		✓	✓		IUT configured with an iFC designed to contact AS1 for MESSAGE	
		✓	✓		IUT has sent MESSAGE to AS1 via ISC	
		✓		✓	IUT has sent MESSAGE to UE2 via GM	
		✓	✓		AS1 has indicated the handling of the whole dialogue to IUT	
	UE1	**IUT**	**AS1**	**UE2**		
Step	**Direction**				**Message**	**IF**
1					**200 response**	
2					**200 response** ✓ P-Charging-Vector header ✓ ioi parameter ➔ type3	**ISC**

Test Purpose						
Identifier:	**TP_IMST2_ISC_GEN_03**					
Summary:	SIP MESSAGE requests that are exchanged between the I-CSCF and any AS shall include the type 3 inter operator identifier (IOI).					
Clause:	4.5.4, paragraph 4					
References:	-			**Config Ref:**	CF_2Gm1ISC	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/2**	
	Entities				**Condition**	
	UE1	**IUT**	**AS1**	**UE2**		
	✓	✓		✓	UE1 and UE2 registered in IUT	
		✓			IUT configured for forwarding MESSAGE directly to AS1	
	UE1	**IUT**	**AS1**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	↳	↱			**MESSAGE**	
2		↳	↱		**MESSAGE** ✓ P-Charging-Vector header ✓ ioi parameter ➔ type3	**ISC**

6.4.2 Registration procedures

Test Purpose					
Identifier:	**TP_IMST2_ISC_REG_01**				
Summary:	An IMS shall support 3rd-party registration or registration with the AS in the same trust domain (initial registration and user-initiated reregistration).				
Clause:	5.4.1.7, paragraph 1				
References:	-		**Config Ref:**	CF_1Gm1ISC	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/3**	

	Entities			Condition	
	UE1	**IUT**	**AS1**		
	×	×		UE1not registered in IUT	
		✓		IUT configured for establishing security association	
	✓			UE1 has sent unprotected REGISTER and has received 401 response	
	✓			UE1 has initiated security association establishment	
		✓	✓	IUT configured with an iFC designed to contact AS1 for REGISTER	
		✓	✓	AS1 configured for being in the same trust domain as IUT	
	UE1	**IUT**	**AS1**		

Step	Direction			Message	IF
1	→	←		**protected REGISTER**	
2		→	←	**REGISTER** ✓ P-Access-Network-Info header ✓ P-Visited-Network-ID header ✓ Request-URI ➔ SIP URI of AS1 ✓ To header ➔ a non barred IMPU from the service profile of the processed iFC ✓ From header ➔ SIP URI of IUT S-CSCF ✓ Contact header ➔ SIP URI of IUT S-CSCF ✓ P-Charging-Vector header ✓ a type3 orig-ioi parameter before the received orig-ioi parameters ✓ P-Charging-Function-Addresses header	**ISC**

Test Purpose					
Identifier:	**TP_IMST2_ISC_REG_02**				
Summary:	An IMS shall support 3rd-party registration or registration with the AS outside the trust domain (initial registration and user-initiated reregistration).				
Clause:	5.4.1.7, paragraph 1				
References:	-		**Config Ref:**	CF_1Gm1ISC	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/3**	

	Entities			Condition	
	UE1	**IUT**	**AS1**		
	×	×		UE1 not registered in IUT	
		✓		IUT configured for establishing security association	
	✓			UE1 has sent unprotected REGISTER and has received 401 response	
	✓			UE1 has initiated security association establishment	
		✓	✓	IUT configured with an iFC designed to contact AS1 for REGISTER	
		×	×	AS1 not configured for being in the same trust domain as IUT	
	UE1	**IUT**	**AS1**		

Step	Direction			Message	IF
1				**protected REGISTER**	
2				**REGISTER** × P-Access-Network-Info header × P-Visited-Network-ID header ✓ Request-URI ➔ SIP URI of AS1 ✓ To header ➔ a non barred IMPU from the service profile of the processed iFC ✓ From header ➔ SIP URI of IUT S-CSCF ✓ Contact header ➔ SIP URI of IUT S-CSCF ✓ P-Charging-Vector header ✓ a type3 orig-ioi parameter before the received orig-ioi parameters	**ISC**

Test Purpose					
Identifier:	**TP_IMST2_ISC_REG_03**				
Summary:	An IMS shall support 3rd-party deregistration with the AS in the same trust domain.				
Clause:	5.4.1.7, paragraph 1				
References:	-		**Config Ref:**	CF_1Gm1ISC	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/3**	

	Entities			Condition	
	UE1	**IUT**	**AS1**		
	✓	✓		UE1 registered in IUT	
		✓	✓	IUT configured with an entry point to AS1	
		✓	✓	IUT configured with an iFC designed to contact AS1 for REGISTER	
		✓	✓	AS1 configured for being in the same trust domain as IUT	
	UE1	**IUT**	**AS1**		
Step	**Direction**			**Message**	**IF**
1	↳	↱		**protected REGISTER** ✓ Expires header ➔ 0	
2		↳	↱	**REGISTER** ✓ P-Access-Network-Info header ✓ P-Visited-Network-ID header ✓ Request-URI ➔ SIP URI of AS1 ✓ To header ➔ a non barred IMPU from the service profile of the processed iFC ✓ From header ➔ SIP URI of IUT S-CSCF ✓ Contact header ➔ SIP URI of IUT S-CSCF	**ISC**

6.4.3 Initial request procedures

Test Purpose						
Identifier:	**TP_IMST2_ISC_INI_01**					
Summary:	When S-CSCF receives any 1xx or 2xx response for a UE subsequent to the initial SIP INVITE then it forwards it towards an AS inside the home network of the S-CSCF.					
Clause:	5.4.4.2.2, paragraph 1					
References:	-			**Config Ref:**	CF_2Gm1ISC	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/3**	
	Entities				**Condition**	
	UE1	**IUT**	**AS1**	**UE2**		
	✓	✓		✓	UE1 and UE2 registered in IUT	
	✓	✓			IUT has received INVITE from UE1	
		✓		✓	IUT has sent INVITE to UE2	
		✓	✓		IUT has sent INVITE to AS1 via ISC	
		✓	✓		AS1 configured for being within same IMS network as IUT	
		✓	✓		IUT configured with an iFC designed to contact AS1 for INVITE	
		✓	✓		AS1 has indicated the handling of the whole dialogue to IUT	
	UE1	**IUT**	**AS1**	**UE2**		
Step	**Direction**				**Message**	**IF**
1		⇦		⇦	**180 response**	
2		⇩	⇨		**180 response** ✓ P-Charging-Function-Addresses header	**ISC**

Test Purpose						
Identifier:	**TP_IMST2_ISC_INI_02**					
Summary:	When S-CSCF receives any 1xx or 2xx response for a UE subsequent to the initial SIP INVITE then it forwards it towards an AS inside the home network of the S-CSCF.					
Clause:	5.4.4.2.2, paragraph 1					
References:	-			**Config Ref:**	CF_2Gm1ISC	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/3**	
	Entities				**Condition**	
	UE1	**IUT**	**AS1**	**UE2**		
	✓	✓		✓	UE1 and UE2 registered in IUT	
	✓	✓			IUT has received INVITE from UE1	
		✓		✓	IUT has sent INVITE to UE2	
		✓	✓		IUT has sent INVITE to AS1 via ISC	
		✓	✓		AS1 configured for being within same IMS network as IUT	
		✓	✓		IUT configured with an iFC designed to contact AS1 for INVITE	
		✓	✓		AS1 has indicated the handling of the whole dialogue to IUT	
	UE1	**IUT**	**AS1**	**UE2**		
Step	**Direction**				**Message**	**IF**
1		⇦		⇦	**200 response**	
2		⇨	⇨		**200 response** ✓ P-Charging-Function-Addresses header	**ISC**

Test Purpose						
Identifier:	**TP_IMST2_ISC_INI_03**					
Summary:	When S-CSCF receives 180 response for a UE subsequent to the initial SIP INVITE then it forwards it towards an AS outside the home network of the S-CSCF.					
Clause:	5.4.4.2.2, paragraph 2					
References:	-			**Config Ref:**	CF_2Gm1ISC	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/3**	
	Entities				**Condition**	
	UE1	**IUT**	**AS1**	**UE2**		
	✓	✓		✓	UE1 and UE2 registered in IUT	
	✓	✓			IUT has received INVITE from UE1	
		✓		✓	IUT has sent INVITE to UE2	
			×		AS1not configured for being within same IMS network as IUT S-CSCF	
		✓	✓		IUT configured with an iFC designed to contact AS1 for INVITE	
		✓	✓		AS1 has indicated the handling of the whole dialogue to IUT	
	UE1	**IUT**	**AS1**	**UE2**		
Step	**Direction**				**Message**	**IF**
1		⇦		⇦	**180 response** ✓ P-Charging-Vector header ✓ access-network-charging-info parameter	
2		⇨	⇨		**180 response** ✓ P-Charging-Vector header × access-network-charging-info parameter	**ISC**

Test Purpose						
Identifier:	**TP_IMST2_ISC_INI_04**					
Summary:	When S-CSCF receives SIP 200 response for a UE subsequent to the initial SIP INVITE then it forwards it towards an AS outside the home network of the S-CSCF.					
Clause:	5.4.4.2.2, paragraph 2					
References:	-			**Config Ref:**	CF_2Gm1ISC	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/3**	
	Entities				**Condition**	
	UE1	**IUT**	**AS1**	**UE2**		
	✓	✓		✓	UE1 and UE2 registered in IUT	
	✓	✓			IUT has received INVITE from UE1	
		✓		✓	IUT has sent INVITE to UE2	
		✓	✓		IUT has sent INVITE to AS1 via ISC	
			×		AS1 not configured for being within same IMS network as IUT S-CSCF	
		✓	✓		IUT configured with an iFC designed to contact AS1 for INVITE	
		✓	✓		AS1 has indicated the handling of the whole dialogue to IUT	
	UE1	**IUT**	**AS1**	**UE2**		
Step	**Direction**				**Message**	**IF**
1		⇦		⇦	**200 response** ✓ P-Charging-Vector header ✓ access-network-charging-info parameter	
2		⇩	⇨		**200 response** ✓ P-Charging-Vector header × access-network-charging-info parameter	**ISC**

Test Purpose						
Identifier:	**TP_IMST2_ISC_INI_05**					
Summary:	When S-CSCF receives no SIP response from the AS for an SIP INVITE request and the iFC has default handling set to SESSION_TERMINATED then it does not forward the request to another AS and returns a SIP 408 response to the originating UE.					
Clause:	5.4.3.2, fifth paragraph after the first numbered list 14)					
References:	-			**Config Ref:**	CF_2Gm2ISC	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/3**	

	Entities					Condition	
	UE1	**IUT**	**AS1**	**AS2**	**UE2**		
	✓	✓			✓	UE1 and UE2 registered in IUT	
	✓	✓			✓	IUT has received INVITE from UE1 addressed to UE2	
		✓	✓			IUT has sent INVITE to AS1 via ISC1	
		✓	✓			IUT configured with an iFC1 designed to contact AS1 for the INVITE	
						iFC1 has default handling set to SESSION TERMINATED	
		✓		✓		IUT configured with an iFC2 designed to contact AS2 for INVITE	
						iFC1 has greater priority than iFC2	
	UE1	**IUT**	**AS1**	**AS2**	**UE2**		

Step	Direction					Message	IF
1						**no response**	**ISC1**
2						**408 response**	
3						**INVITE**	**ISC2**

6.4.4 Standalone requests procedures

Test Purpose					
Identifier:	**TP_IMST2_ISC_STA_01**				
Summary:	When the S-CSCF receives a SIP MESSAGE request it forwards the request to an AS within the same trust domain as the IUT.				
Clause:	5.4.3.2 first numbered list 5)				
References:	-		**Config Ref:**	CF_2Gm1ISC	
IUT Role:	IMS		**Selection Expression:**	**PICS A.2/3**	

	Entities			Condition	
	UE1	**IUT**	**AS1**		
	✓	✓		UE1 registered in IUT	
		✓	✓	AS1 configured for being in the same trust domain as IUT	
		✓	✓	IUT configured with an iFC designed to contact AS1 for MESSAGE	
	UE1	**IUT**	**AS1**		
Step	**Direction**			**Message**	**IF**
1	↳	↱		**MESSAGE**	
2		↳	↱	**MESSAGE** ✓ P-Asserted-Service header ✓ topmost Route header ➔ SIP URI of AS1 ✓ second Route header ➔ SIP URI of IUT S-CSCF ✓ P-Charging-Vector header ✓ type3 orig-ioi parameter before the received orig-ioi parameters	**ISC**

Test Purpose							
Identifier:	**TP_IMST2_ISC_STA_02**						
Summary:	When S-CSCF receives 5xx from the AS for a SIP MESSAGE request and the iFC has set to SESSION_CONTINUED then it forwards the request to a second AS.						
Clause:	5.4.3.2, fifth paragraph after the first numbered list 14)						
References:	-				**Config Ref:**	CF_2Gm2ISC	
IUT Role:	IMS				**Selection Expression:**	**PICS A.2/3**	
	Entities					**Condition**	
	UE1	**IUT**	**AS1**	**AS2**	**UE2**		
	✓	✓			✓	UE1 and UE2 registered in IUT	
	✓	✓			✓	IUT has received MESSAGE from UE1 addressed to UE2	
		✓	✓			IUT has sent MESSAGE to AS1 via ISC1	
		✓	✓			IUT configured with an iFC1 designed to contact AS1 for the MESSAGE	
						iFC1 has default handling set to SESSION CONTINUED	
						iFC1 has no default handling	
		✓		✓		IUT configured with an iFC2 designed to contact AS2 for MESSAGE	
						iFC1 has greater priority than iFC2	
	UE1	**IUT**	**AS1**	**AS2**	**UE2**		
Step	**Direction**					**Message**	**IF**
1		←	←			**5xx response**	**ISC1**
2		→		→		**MESSAGE**	**ISC2**

Test Purpose							
Identifier:	**TP_IMST2_ISC_STA_03**						
Summary:	When S-CSCF receives 408 response from the AS for a SIP MESSAGE request and the iFC has set to SESSION_CONTINUED then it forwards the request to a second AS.						
Clause:	5.4.3.2, fifth paragraph after the first numbered list 14)						
References:	-				**Config Ref:**	CF_2Gm2ISC	
IUT Role:	IMS				**Selection Expression:**	**PICS A.2/3**	
	Entities					**Condition**	
	UE1	**IUT**	**AS1**	**AS2**	**UE2**		
	✓	✓			✓	UE1 and UE2 registered in IUT	
	✓	✓			✓	IUT has received MESSAGE from UE1 addressed to UE2	
		✓	✓			IUT has sent MESSAGE to AS1 via ISC1	
		✓	✓			IUT configured with an iFC1 designed to contact AS1 for the MESSAGE	
						(iFC1 has default handling set to SESSION CONTINUED	
						iFC1 has no default handling)	
		✓		✓		IUT configured with an iFC2 designed to contact AS2 for MESSAGE	
						iFC1 has greater priority than iFC2	
	UE1	**IUT**	**AS1**	**AS2**	**UE2**		
Step	**Direction**					**Message**	**IF**
1		←	←			**408 response**	**ISC1**
2		→		→		**MESSAGE**	**ISC2**

Test Purpose							
Identifier:	**TP_IMST2_ISC_STA_04**						
Summary:	When S-CSCF receives no SIP response from the AS for a SIP MESSAGE request and the iFC has set to SESSION_CONTINUED then it forwards the request to a second AS.						
Clause:	5.4.3.2, fifth paragraph after the first numbered list 14)						
References:	-				**Config Ref:**	CF_2Gm2ISC	
IUT Role:	IMS				**Selection Expression:**	**PICS A.2/3**	
	Entities					**Condition**	
	UE1	**IUT**	**AS1**	**AS2**	**UE2**		
	✓	✓			✓	UE1 and UE2 registered in IUT	
	✓	✓			✓	IUT has received MESSAGE from UE1 addressed to UE2	
		✓	✓			IUT has sent MESSAGE to AS1 via ISC1	
		✓	✓			IUT configured with an iFC1 designed to contact AS1 for the MESSAGE	
						(iFC1 has default handling set to SESSION CONTINUED	
						iFC1 has no default handling)	
		✓		✓		IUT configured with an iFC2 designed to contact AS2 for MESSAGE	
						iFC1 has greater priority than iFC2	
	UE1	**IUT**	**AS1**	**AS2**	**UE2**		
Step	**Direction**					**Message**	**IF**
1						**no response**	**ISC1**
2						**MESSAGE**	**ISC2**

Test Purpose							
Identifier:	**TP_IMST2_ISC_STA_05**						
Summary:	When S-CSCF receives 5xx response from the AS for a SIP MESSAGE request and the iFC has default handling set to SESSION_TERMINATED then it returns the response to the UE and does not forward the request to a second AS.						
Clause:	5.4.3.2, fifth paragraph after the first numbered list 14)						
References:	-				**Config Ref:**	CF_2Gm2ISC	
IUT Role:	IMS				**Selection Expression:**	**PICS A.2/3**	
	Entities					**Condition**	
	UE1	**IUT**	**AS1**	**AS2**	**UE2**		
	✓	✓			✓	UE1 and UE2 registered in IUT	
	✓	✓			✓	IUT has received MESSAGE from UE1 addressed to UE2	
		✓	✓			IUT has sent MESSAGE to AS1 via ISC1	
		✓	✓			IUT configured with an iFC1 designed to contact AS1 for the MESSAGE	
						iFC1 has default handling set to SESSION TERMINATED	
		✓		✓		IUT configured with an iFC2 designed to contact AS2 for MESSAGE	
						iFC1 has greater priority than iFC2	
	UE1	**IUT**	**AS1**	**AS2**	**UE2**		
Step	**Direction**					**Message**	**IF**
1		→	→			**5xx response**	**ISC1**
2	←	←				**5xx response**	
3		→||		||→		**MESSAGE**	**ISC2**

Test Purpose							
Identifier:	**TP_IMST2_ISC_STA_06**						
Summary:	When S-CSCF receives 408 response from the AS for a SIP MESSAGE request and the iFC has default handling set to SESSION_TERMINATED then it returns the response to the UE and does not forward the request to a second AS.						
Clause:	5.4.3.2, fifth paragraph after the first numbered list 14)						
References:	-				**Config Ref:**	CF_2Gm2ISC	
IUT Role:	IMS				**Selection Expression:**	**PICS A.2/3**	
	Entities					**Condition**	
	UE1	**IUT**	**AS1**	**AS2**	**UE2**		
	✓	✓			✓	UE1 and UE2 registered in IUT	
	✓	✓			✓	IUT has received MESSAGE from UE1 addressed to UE2	
		✓	✓			IUT has sent MESSAGE to AS1 via ISC1	
		✓	✓			IUT configured with an iFC1 designed to contact AS1 for the MESSAGE	
						iFC1 has default handling set to SESSION TERMINATED	
		✓		✓		IUT configured with an iFC2 designed to contact AS2 for MESSAGE	
						iFC1 has greater priority than iFC2	
	UE1	**IUT**	**AS1**	**AS2**	**UE2**		
Step	**Direction**					**Message**	**IF**
1						**408 response**	**ISC1**
2						**408 response**	
3						**MESSAGE**	**ISC2**

Test Purpose						
Identifier:	**TP_IMST2_ISC_STA_07**					
Summary:	When S-CSCF receives a SIP 200 response from the AS for a SIP MESSAGE request then it forwards it to the UE.					
Clause:	5.4.3.2					
References:	-			**Config Ref:**	CF_2Gm1ISC	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/3**	

	Entities				Condition	
	UE1	**IUT**	**AS1**	**UE2**		
	✓	✓		✓	UE1 and UE2 registered in IUT	
	✓	✓		✓	IUT has received MESSAGE from UE1 addressed to UE2	
		✓	✓		IUT configured with an iFC designed to contact AS1 for the MESSAGE	
		✓	✓		IUT has sent MESSAGE to AS1 via ISC	
	UE1	**IUT**	**AS1**	**UE2**		

Step	Direction				Message	IF
1		→	←		**200 response**	**ISC**
2	←	←			**200 response**	

Test Purpose						
Identifier:	**TP_IMST2_ISC_STA_08**					
Summary:	S-CSCF forwards to an Application Server (AS) the response to a SIP MESSAGE request from a served user or from a PSI that initiated the standalone transaction.					
Clause:	5.4.3.2, fifth paragraph after the first numbered list 14)					
References:	-			**Config Ref:**	CF_2Gm1ISC	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/3**	
	Entities				**Condition**	
	UE1	**IUT**	**AS1**	**UE2**		
	✓	✓		✓	UE1 and UE2 registered in IUT	
	✓	✓		✓	IUT has received MESSAGE from UE1 addressed to UE2	
					containing the type3 orig-ioi parameter	
		✓		✓	IUT has sent MESSAGE to UE2 via GM	
		✓	✓		IUT has sent MESSAGE to AS1 via ISC	
		✓	✓		AS1 has indicated the handling of the whole dialogue to IUT	
	UE1	**IUT**	**AS1**	**UE2**		
Step	**Direction**				**Message**	**IF**
1		⇦		⇦	**200_response**	
2		⇨	⇨		**200_response** ✓ P-Charging-Vector header ✓ type3 orig-ioi parameter from the initial MESSAGE ✓ type3 term-ioi parameter	**ISC**

Test Purpose						
Identifier:	**TP_IMST2_ISC_STA_09**					
Summary:	When a S-CSCF receives a SIP MESSAGE request destined for an unregistered user it forwards the request to the AS.					
Clause:	5.4.3.3					
References:	-			**Config Ref:**	CF_1Gm1ISC	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/3**	
	Entities				**Condition**	
	UE1	**IUT**	**AS1**	**UE2**		
	✓	✓			UE1 registered in IUT	
		×		×	UE2 not registered in IUT	
		✓	✓		IUT configured with an iFC designed to contact AS1 for MESSAGE	
	UE1	**IUT**	**AS1**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	⇘	⇗			**MESSAGE**	
2		⇘	⇗		**MESSAGE**	**ISC**

Test Purpose						
Identifier:	**TP_IMST2_ISC_STA_10**					
Summary:	When the I-CSCF receives a SIP MESSAGE request containing P-Charging-Vector header including icid parameter it forwards it to the AS.					
Clause:	5.3.2.1, paragraph 2					
References:	-			**Config Ref:**	CF_2Gm1ISC	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/3**	
	Entities				**Condition**	
	UE1	**IUT**	**AS1**	**UE2**		
	✓	✓		✓	UE1 and UE2 registered in IUT	
		✓			IUT configured for forwarding MESSAGE directly to AS1	
	UE1	**IUT**	**AS1**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	⇘	⇗			**MESSAGE** ✓ P-Charging-Vector header ✓ icid parameter	
2		⇘	⇗		**MESSAGE** ✓ P-Charging-Vector header ✓ icid parameter	**ISC**

Test Purpose						
Identifier:	**TP_IMST2_ISC_STA_11**					
Summary:	When the I-CSCF receives a SIP MESSAGE request containing P-Charging-Vector header not including icid parameter then it adds this parameter prior to forwarding it to the AS.					
Clause:	5.3.2.1, paragraph 2					
References:	-			**Config Ref:**	CF_2Gm1ISC	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/3**	
	Entities				**Condition**	
	UE1	**IUT**	**AS1**	**UE2**		
	✓	✓		✓	UE1 and UE2 registered in IUT	
		✓			IUT configured for forwarding MESSAGE directly to AS1	
	UE1	**IUT**	**AS1**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	⇘	⇗			**MESSAGE** ✓ P-Charging-Vector header ✗ icid parameter	
2		⇘	⇗		**MESSAGE** ✓ P-Charging-Vector header ✓ icid parameter	**ISC**

6.3.5 Subsequent requests on a dialogue procedures

Test Purpose						
Identifier:	**TP_IMST2_ISC_SUB_01**					
Summary:	When S-CSCF receives a SIP ACK request then it forwards it to an AS outside the trusted domain.					
Clause:	5.4.3.2					
References:	-			**Config Ref:**	CF_2Gm1ISC	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/3**	
	Entities				**Condition**	
	UE1	**IUT**	**AS1**	**UE2**		
	✓	✓		✓	UE1 and UE2 registered in IUT	
	✓	✓		✓	IUT has received INVITE from UE1 addressed to UE2	
		✓	✓		IUT configured with an iFC designed to contact AS1 for INVITE	
		✓		✓	IUT has sent INVITE to UE2 via GM	
		✓	✓		IUT has sent INVITE to AS1 via ISC	
		✓		✓	IUT has received 200 response from UE2	
	✓	✓			IUT has sent 200 response to UE1	
		×	×		AS1 not configured for being in the same trust domain as IUT	
		✓	✓		AS1 has indicated the handling of the whole dialogue to IUT	
	UE1	**IUT**	**AS1**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	↳	↱			**ACK**	
2		↳	↱		**ACK** × P-Access-Network-Info header ✓ P-Charging-Vector header × access-network-charging-info parameter	**ISC**

6.4.6 Target refresh request procedures

Test Purpose						
Identifier:	**TP_IMST2_ISC_TAR_01**					
Summary:	When S-CSCF receives from the served user a target refresh request for a dialogue then it forwards it to an AS outside the trusted domain and returns a 100 response to the UE.					
Clause:	5.4.3.2					
References:	-			**Config Ref:**	CF_2Gm1ISC	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/3**	
	Entities				**Condition**	
	UE1	**IUT**	**AS1**	**UE2**		
	✓	✓			UE1 registered in IUT	
	✓	✓		✓	IUT has received INVITE from UE1 addressed to UE2	
		✓	✓		IUT configured with an iFC designed to contact AS1 for INVITE	
		✓		✓	IUT has sent INVITE to UE2 via GM	
		✓	✓		IUT has sent INVITE to AS1 via ISC	
		×	×		AS1 not configured for being in the same trust domain as IUT	
		✓	✓		AS1 has indicated the handling of the whole dialogue to IUT	
	UE1	**IUT**	**AS1**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	→	→			**target refresh INVITE**	
2		→	→		**INVITE** × P-Access-Network-Info header ✓ P-Charging-Vector header × access-network-charging-info parameter	**ISC**
3	←	←			**100 response**	**Gm**

Test Purpose						
Identifier:	**TP_IMST2_ISC_TAR_02**					
Summary:	When S-CSCF receives a SIP reINVITE request from a UE within an established dialogue then it forwards it to an AS inside the home network of the S-CSCF and returns a 100 response to the UE.					
Clause:	5.4.3.2					
References:	-			**Config Ref:**	CF_2Gm1ISC	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/3**	
	Entities				**Condition**	
	UE1	**IUT**	**AS1**	**UE2**		
	✓	✓		✓	UE1 and UE2 registered in IUT	
	✓	✓		✓	IUT has received INVITE from UE1 addressed to UE2 - - INVITE	
		✓	✓		IUT configured with an iFC designed to contact AS1 for INVITE	
		✓		✓	IUT has sent INVITE to UE2 via GM	
		✓	✓		IUT has sent INVITE to AS1 via ISC	
		✓	✓		AS1 has indicated the handling of the whole dialogue to IUT	
			✓		AS1 configured for being within same IMS network as IUT S-CSCF	
	UE1	**IUT**	**AS1**	**UE2**		
Step	**Direction**				**Message**	**IF**
1	→	←			**target refresh INVITE**	
2		→	←		**INVITE** ✓ P-Access-Network-Info header ✓ P-Charging-Vector header ✓ access-network-charging-info parameter	**ISC**
3	←	→			**100 response**	**Gm**

Test Purpose						
Identifier:	**TP_IMST2_ISC_TAR_03**					
Summary:	When the S-CSCF receives a SIP reINVITE request from a UE within an established dialogue then it forwards it to an AS outside the home network of the S-CSCF without charging information and returns a 100 response to the originating UE.					
Clause:	5.4.3.2					
References:	-			**Config Ref:**	CF_2Gm1ISC	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/3**	

	Entities				Condition	
	UE1	**IUT**	**AS1**	**UE2**		
	✓	✓			UE1 registered in IUT	
	✓	✓		✓	IUT has received INVITE from UE1 addressed to UE2	
		✓	✓		IUT configured with an iFC designed to contact AS1 for INVITE	
		✓		✓	IUT has sent INVITE to UE2 via GM	
		✓	✓		IUT has sent INVITE to AS1 via ISC	
		✓	✓		AS1 has indicated the handling of the whole dialogue to IUT	
			×		AS1 not configured for being within same IMS network as IUT S-CSCF	
	UE1	**IUT**	**AS1**	**UE2**		

Step	Direction				Message	IF
1	→				**target refresh INVITE**	
2		→	→		**INVITE** × P-Access-Network-Info header ✓ P-Charging-Vector header × access-network-charging-info parameter	**ISC**
3	←	←			**100 response**	**Gm**

Test Purpose						
Identifier:	**TP_IMST2_ISC_TAR_04**					
Summary:	When S-CSCF receives a SIP 200 (OK) response to a SIP reINVITE request then forwards it to an AS outside the home network of the S-CSCF without charging information.					
Clause:	5.4.6.1.3, paragraph 1					
References:	-			**Config Ref:**	CF_2Gm1ISC	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/3**	

	Entities				Condition	
	UE1	**IUT**	**AS1**	**UE2**		
	✓	✓			UE1 registered in IUT	
	✓	✓		✓	IUT has received INVITE from UE1 addressed to UE2	
		✓	✓		IUT configured with an iFC designed to contact AS1 for INVITE	
		✓		✓	IUT has sent INVITE to UE2 via GM	
		✓	✓		IUT has sent INVITE to AS1 via ISC	
		×	×		AS1 not configured for being within same IMS network as IUT	
		✓	✓		AS1 has indicated the handling of the whole dialogue to IUT	
	✓	✓			IUT has received target refresh INVITE from UE1	
		✓		✓	IUT has sent target refresh INVITE to UE2 via Gm	
		✓	✓		IUT has sent target refresh INVITE to AS1 via ISC	
	UE1	**IUT**	**AS1**	**UE2**		

Step	Direction				Message	IF
1		⇦		⇦	**200 response** ✓ P-Charging-Vector header ✓ access-network-charging-info parameter	
2		⇦	⇦		**200 response** ✓ P-Charging-Vector header × access-network-charging-info parameter	**ISC**

Test Purpose						
Identifier:	**TP_IMST2_ISC_TAR_05**					
Summary:	When S-CSCF receives a SIP 200 (OK) response to a SIP reINVITE request then it forwards it to an AS located inside the home network of the S-CSCF.					
Clause:	5.4.6.1.3, paragraph 1					
References:	-			**Config Ref:**	CF_2Gm1ISC	
IUT Role:	IMS			**Selection Expression:**	**PICS A.2/3**	
	Entities				**Condition**	
	UE1	**IUT**	**AS1**	**UE2**		
	✓	✓			UE1 registered in IUT	
	✓	✓		✓	IUT has received INVITE from UE1 addressed to UE2	
		✓	✓		IUT configured with an iFC designed to contact AS1 for INVITE	
		✓		✓	IUT has sent INVITE to UE2 via GM	
		✓	✓		IUT has sent INVITE to AS1 via ISC	
		✓	✓		AS1 configured for being within same IMS network as IUT	
		✓	✓		AS1 has indicated the handling of the whole dialogue to IUT	
	✓	✓			IUT has received target refresh INVITE from UE1	
		✓		✓	IUT has sent target refresh INVITE to UE2 via Gm	
		✓	✓		IUT has sent target refresh INVITE to AS1 via ISC	
	UE1	**IUT**	**AS1**	**UE2**		
Step	**Direction**				**Message**	**IF**
1					**200 response** ✓ P-Charging-Vector header ✓ access-network-charging-info parameter	
2					**200 response** ✓ P-Charging-Vector header ✓ access-network-charging-info parameter	**ISC**

Annex A (normative): TPLan code

The test purposes defined in the present document have been automatically generated from the text files in the archive file ts_10279002v020101p0.zip which accompanies the present document. The raw text file has been converted to a table format to allow better readability.

The two formats shall be considered equivalent. In the event that there appears to be syntactical or semantic differences between the two then the textual TPlan representation takes precedence over the table format.

Annex B (informative): Bibliography

IETF RFC 3261: "SIP: Session Initiation Protocol".

ISO/IEC 9646-2: "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 2: Abstract Test Suite specification".

ETSI EG 202 568: "Methods for Testing and Specification (MTS); Internet Protocol Testing (IPT); Testing: Methodology and Framework".

History

Document history		
V1.1.1	March 2010	Publication
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