ETSI TS 101 594-2 V5.1.1 (2012-10)

IMS Network Testing (INT);
Explicit Communication Transfer (ECT) using
IP Multimedia (IM) Core Network (CN) subsystem;
Conformance Test Specification;
Part 2: Test Suite Structure and Test Purposes (TSS&TP)

Reference
DTS/INT-00071-2

Keywords
ECT, IMS, testing, TSS&TP

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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 Explicit Communication Transfer (ECT) using IP Multimedia (IM) Core Network (CN) subsystem; Conformance Test Specification, as identified below:

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

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

1 Scope

The present document provides the Test Suite Structure and Test Purposes (TSS&TP) for the protocol specification as defined in ETSI [1] in compliance with the relevant requirements.

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 referenced 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 124 629: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Explicit Communication Transfer (ECT) using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification (3GPP TS 24.629 Release 10)".

[2] ETSI TS 101 594-1: "Technical Committee for IMS Network Testing (INT); Explicit Communication Transfer (ECT) using IP Multimedia (IM) Core Network (CN) subsystem; Conformance Test Specification (3GPP Release 10); Part 1: Protocol Implementation Conformance Statement (PICS)".

[3] ETSI TS 124 628: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Common Basic Communication procedures using IP Multimedia (IM) Core Network (CN) subsystem; Protocol specification (3GPP TS 24.628 Release 10)".

2.2 Informative references

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

Not applicable.

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in [1] apply.

3.2 Symbols

For the purposes of the present document, the symbols given in [1] apply.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in [1] and the following apply:

ACR-CB	Anonymous Communication Rejection- Communication Barring
ISC	IM-CN Service Control
IUT	Implementation Under Test
NNI	Network Network Interface
PIXIT	Protocol Implementation eXtra Information for Testing
SIP	Session Initiation Protocol
SUT	System Under Test
TP	Test Purpose
UE	User Equipment
URI	Uniform Resource Identifier

4 Test Suite Structure (TSS) and configuration

Netw		
	TransferorAS	ECT_N01_xxx
	TransfereeAS	ECT_N02_xxx
User	**Transferor**	ECT_U01_xxx
	Transferee	ECT_U02_xxx
	TransferTarget	ECT_U03_xxx
Interaction	**OIR**	ECT_N03_xxx
	ACR-CB	ECT_N04_xxx
	CONF	ECT_N05_xxx
	ECT	ECT_N06_xxx

Figure 4.1: Test suite structure

4.1 Configuration

The scope of the present document is to test the signalling and procedural aspects of the stage 3 requirements as described in [1]. The stage 3 description respects the requirements to several network entities and also to requirements regarding to end devices. Therefore several interfaces (reference points) are addressed to satisfy the test of the different entities.

Therefore to test the appropriate entities the configurations below are applicable:

Testing of the Application Server: This entity is responsible to perform the service. Hence the ISC interface is the appropriate access point. Figure 4.1.1 points to this.

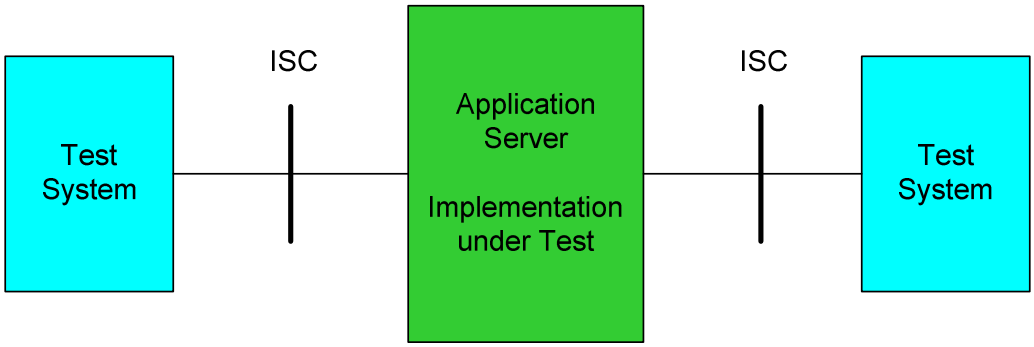

Figure 4.1.1: Applicable interface to test AS functionalities

If the ISC interface is not accessible it is also applicable to perform the test of the AS using any NNI (Mw, Mg, Mx) interface (consider figure 4.1.2). In case only the Gm interface is accessible this shall be used instead. In this case, be aware that the verification of several requirements is impeded.

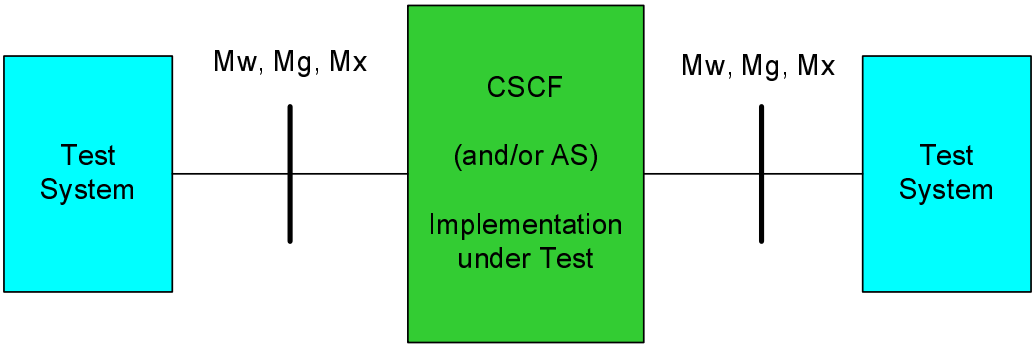

Figure 4.1.2: Applicable interfaces to test using the (generic) NNI interface

Figure 4.1.2 illustrates the usage of any NNI interface.

Testing of User Equipment: There are several requirements regarding to the end devices. Therefore a special configuration appears.

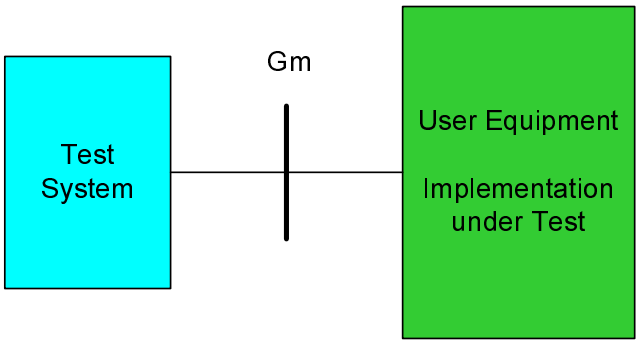

Figure 4.1.3: Applicable configuration to test the User Equipment

5 Test Purposes (TP)

5.1 Introduction

For each test requirement a TP is defined.

5.1.1 TP naming convention

TPs are numbered, starting at 001, 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 5.1.1).

Table 5.1.1: TP identifier naming convention scheme

Identifier: **<ss>_<iut><group>_<nnn>**				
<ss>	=	supplementary service:	e.g. "ECT"	
<iut>	=	type of IUT:	U N	User Network
<group>	=	group	2 digit field representing group reference according to TSS	
<nnn>	=	sequential number	(001-999)	

5.1.2 Test strategy

As the base standard [1] contains no explicit requirements for testing, the TPs were generated as a result of an analysis of the base standard and the PICS specification [2].

5.2 Signalling requirements

5.2.1 Actions at the Transferor UE

TSS	**TP**	**Reference**	**Selection expression**
User/Transferor	ECT_U01_001	4.5.2.1	PICS 4.5.1/1 AND PICS 4.6.1/1

Test purpose

The UE transfers a communication with a Transferee to the Transfer Target (Transferor, blind transfer).

Ensure that the UE is able to transfer a communication with the Transferee, optionally put on hold before, to the Transfer Target using the blind transfer method. The session with user Transferee is terminated before information about the progress of the transfer is received.

SIP header values:

REFER: Request URI: **Gm#2**
Refer-To contains **Gm#3** URI, method=invite
Referred-By contains **Gm#1** URI
NOTIFY(100): Event contains **refer**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200): Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**

Comments:

UE (Gm#1)		**Test equipment (Gm#2)**
	Establishment of session #1	
CASE A		
	Session #1 on hold	
REFER	→	REFER
202 Accepted	←	202 Accepted
BYE	→	BYE
200 OK (BYE)	←	200 OK (BYE)
NOTIFY(100)	←	NOTIFY(100)
200 OK NOTIFY	→	200 OK NOTIFY
NOTIFY(200)	←	NOTIFY(200)
200 OK NOTIFY	→	200 OK NOTIFY
CASE B		
REFER	→	REFER
202 Accepted	←	202 Accepted
BYE	→	BYE
200 OK (BYE)	←	200 OK (BYE)
NOTIFY(100)	←	NOTIFY(100)
200 OK NOTIFY	→	200 OK NOTIFY
NOTIFY(200)	←	NOTIFY(200)
200 OK NOTIFY	→	200 OK NOTIFY

TSS	TP	Reference	Selection expression
User/Transferor	ECT_U01_002	4.5.2.1	PICS 4.5.1/1 AND PICS 4.6.1/2

Test purpose

The UE transfers a communication with a Transferee to the Transfer Target (Transferor, assured transfer).
Ensure that the UE is able to transfer a communication with the Transferee, optionally put on hold before, to the Transfer Target using the assured transfer method. The session with Transferee is terminated after information about the progress of the transfer is received.

SIP header values:

REFER: Request URI: **Gm#2**
Refer-To contains **Gm#3** URI; method=invite
Referred-By contains **Gm#1** URI
NOTIFY(100): Event contains **refer**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200): Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**

Comments:

UE (Gm#1)		**Test equipment (Gm#2)**
Establishment of session #1		
CASE A		
Session #1 on hold		
REFER	→	REFER
202 Accepted	←	202 Accepted
NOTIFY(100)	←	NOTIFY(100)
200 OK NOTIFY	→	200 OK NOTIFY
INVITE(inactive/sendonly)		INVITE(inactive/sendonly)
200 OK INVITE(inactive/recvonly)		200 OK INVITE(inactive/recvonly)
ACK		ACK
NOTIFY(200)	←	NOTIFY(200)
200 OK NOTIFY	→	200 OK NOTIFY
BYE	→	BYE
200 OK (BYE)	←	200 OK (BYE)
CASE B		
REFER	→	REFER
202 Accepted	←	202 Accepted
NOTIFY(100)	←	NOTIFY(100)
200 OK NOTIFY	→	200 OK NOTIFY
INVITE(inactive/sendonly)		INVITE(inactive/sendonly)
200 OK INVITE(inactive/recvonly)		200 OK INVITE(inactive/recvonly)
ACK		ACK
NOTIFY(200)	←	NOTIFY(200)
200 OK NOTIFY	→	200 OK NOTIFY
BYE	→	BYE
200 OK (BYE)	←	200 OK (BYE)

TSS	**TP**	**Reference**	**Selection expression**
User/Transferor	ECT_U01_003	4.5.2.1	PICS 4.5.1/1 AND PICS 4.6.1/3

Test purpose

The UE transfers a communication with a Transferee to the Transfer Target (Transferor, consultative transfer).
Ensure that the UE is able to transfer a communication with the Transferee, optionally put on hold before, to the Transfer Target, having a session, optionally put on hold before, using the consultative transfer method. The REFER request contains a replaces header escaped in the Refer-To header to request the termination of the session between Transferor and Transfer Target (session #2).

SIP header values:

REFER: Request URI: **Gm#2**
Refer-To: contains **Gm#3 URI;** method=invite?Replaces=**call-id1**%3B**to-tag**%3D**Session1**%3B **from-tag**%3D**Session1**& Require=replaces
Referred-By contains **Gm#1** URI
NOTIFY(100):Event contains **refer**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**

Comments:

UE (Gm#1)		**Test equipment (Gm#2)**
	Establishment of session #1 (Session #1 on hold)	
	Establishment of session #2 (Session #2 on hold)	
REFER	→	REFER
202 Accepted	←	202 Accepted
CASE A		
NOTIFY(100)	←	NOTIFY(100)
200 OK NOTIFY	→	200 OK NOTIFY
NOTIFY(200)	←	NOTIFY(200)
200 OK NOTIFY	→	200 OK NOTIFY
BYE #1	→	BYE
200 OK (BYE)	←	200 OK (BYE)
BYE	←	BYE #2
200 OK (BYE)	→	200 OK (BYE)
CASE B		
NOTIFY(100)	←	NOTIFY(100)
200 OK NOTIFY	→	200 OK NOTIFY
BYE	←	BYE #2
200 OK (BYE)	→	200 OK (BYE)
NOTIFY(200)	←	NOTIFY(200)
200 OK NOTIFY	→	200 OK NOTIFY
BYE #1	→	BYE
200 OK (BYE)	←	200 OK (BYE)

5.2.2 Actions at the Transferor AS

TSS	TP	Reference	Selection expression
Netw/TransferorAS	ECT_N01_001	4.5.2.4	PICS 4.5.1/2 AND PICS 4.7.1/2 AND NOT (PICS 4.7.1/4 OR PICS 4.7.1/5)

Test purpose

Communication transfer: ***Assured transfer****. Transferor was originator of the originating call.*

Ensure that a Transferor can successfully transfer the communication with the transferee set on hold before and the Transferor is notified about the processing. After the communication between the Transferee and the Transfer Target is confirmed, the communication between Transferor and Transferee is terminated. The Transferor was the initiator of the originating communication.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI; method=invite
Referred-By contains **ISC#1** URI
REFER 2: Refer-To contains **ECT Session Identifier** URI; method=invite
Referred-By contains ISC#ISC#1 URI
INVITE 3: Request URI = **ECT Session Identifier** URI
INVITE 4: Request URI = **ISC#3** URI
NOTIFY(100): Event contains **refer**
Subscription-State: **active;expires=(any value)**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200): Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**
Subscription-State: terminated;reason=noresource

Comments:

ISC#1		**AS Transferor**		**ISC#2**		**ISC#3**
INVITE 1	→		→	INVITE		
180 Ringing	←		←	180 Ringing		
200 OK (INVITE)	←		←	200 OK (INVITE)		
ACK	→		→	ACK		
INVITE 2 (sendonly)	→		→	INVITE (sendonly)		
200 OK (recvonly)	←		←	200 OK (recvonly)		
ACK	→		→	ACK		
REFER 1	→	REFER				
		REFER 2	→	REFER		
		202 Accepted	←	202 Accepted		
202 Accepted	←	202 Accepted				
INVITE (inactive)	←		←	INVITE (inactive)		
200 OK (inactive)	→		→	200 OK (inactive)		
ACK	←		←	ACK		
NOTIFY(100)	←		←	NOTIFY(100)		
200 OK NOTIFY	→		→	200 OK NOTIFY		
		INVITE	←	INVITE 3		
		INVITE 4	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		180 Ringing	→	180 Ringing		
		200 OK	←		←	200 OK
		200 OK	→	200 OK		
				ACK	→	ACK
NOTIFY(200)	←		←	NOTIFY(200)		
200 OK NOTIFY	→		→	200 OK NOTIFY		
BYE	→		→	BYE		
200 OK (BYE)	←		←	200 OK (BYE)		

Communication ISC#2 with ISC#3

Apply post test routine

TSS	TP	Reference	Selection expression
Netw/TransferorAS	ECT_N01_002	4.5.2.4	PICS 4.5.1/2 AND PICS 4.7.1/2 AND NOT (PICS 4.7.1/4 OR PICS 4.7.1/5)

Test purpose

Communication transfer: ***Assured transfer****. Transferee was originator of the originating call.*

Ensure that a Transferor can successfully transfer the communication with the transferee set on hold before and the Transferor is notified about the processing. After the communication between the Transferee and the Transfer Target is confirmed, the communication between Transferor and Transferee is terminated. The Transferee was the initiator of the originating communication.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI; method=invite
Referred-By contains **ISC#1** URI
REFER 2: Refer-To contains **ECT Session Identifier** URI; method=invite
Referred-By contains ISC#1 URI
INVITE 3: Request URI = **ECT Session Identifier** URI
INVITE 4: Request URI = **ISC#3** URI
NOTIFY(100):Event contains **refer**
Subscription-State: **active;expires=(any value)**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**
Subscription-State: terminated;reason=noresource

Comments:

ISC#1		AS Transferor		ISC#2		ISC#3
INVITE	←		←	INVITE 1		
180 Ringing	→		→	180 Ringing		
200 OK (INVITE)	→		→	200 OK (INVITE)		
ACK	←		←	ACK		
INVITE 2 (sendonly)	→		→	INVITE (sendonly)		
200 OK (recvonly)	←		←	200 OK (recvonly)		
ACK	→		→	ACK		
REFER 1	→	REFER				
			→	REFER 2		
		202 Accepted	←	202 Accepted		
202 Accepted	←	202 Accepted				
INVITE (inactive)	←		←	INVITE (inactive)		
200 OK (inactive)	→		→	200 OK (inactive)		
ACK	←		←	ACK		
NOTIFY(100)	←		←	NOTIFY(100)		
200 OK NOTIFY	→		→	200 OK NOTIFY		
		INVITE	←	INVITE 3		
		INVITE 4	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		180 Ringing	→	180 Ringing		
		200 OK	←		←	200 OK
		200 OK	→	200 OK		
				ACK	→	ACK
NOTIFY(200)	←		←	NOTIFY(200)		
200 OK NOTIFY	→		→	200 OK NOTIFY		
BYE	→		→	BYE		
200 OK (BYE)	←		←	200 OK (BYE)		

Communication ISC#2 with ISC#3

Apply post test routine

TSS	TP	Reference	Selection expression
Netw/TransferorAS	ECT_N01_003	4.5.2.4	PICS 4.5.1/2 AND PICS 4.7.1/1 AND NOT (PICS 4.7.1/4 OR PICS 4.7.1/5)

Test purpose

Communication transfer: ***Blind transfer****. Transferor was originator of the originating call.*

Ensure that a Transferor can successfully transfer the communication with the transferee set on hold before and the Transferor is notified about the processing. After the REFER request to the Transferee is sent, the communication between Transferor and Transferee is terminated. The Transferor was the initiator of the originating communication.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI; method=invite
Referred-By contains I**SC#1** URI
REFER 2: Refer-To contains **ECT Session Identifier** URI; method=invite
Referred-By contains **ISC#1** URI
INVITE 3: Request URI = **ECT Session Identifier** URI
INVITE 4: Request URI = **ISC#3** URI
NOTIFY(100):Event contains **refer**
Subscription-State: **active;expires=(any value)**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**
Subscription-State: terminated;reason=noresource

Comments:

ISC#1		AS Transferor		ISC#2		ISC#3
INVITE 1	→		→	INVITE		
180 Ringing	←		←	180 Ringing		
200 OK (INVITE)	←		←	200 OK (INVITE)		
ACK	→		→	ACK		
INVITE 2 (sendonly)	→		→	INVITE (sendonly)		
200 OK (recvonly)	←		←	200 OK (recvonly)		
ACK	→		→	ACK		
REFER 1	→	REFER				
		REFER 2	→	REFER		
		202 Accepted	←	202 Accepted		
202 Accepted	←	202 Accepted				
BYE	→		→	BYE		
200 OK (BYE)	←		←	200 OK (BYE)		
NOTIFY(100)	←		←	NOTIFY(100)		
200 OK NOTIFY	→		→	200 OK NOTIFY		
		INVITE	←	INVITE 3		
		INVITE 4	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		180 Ringing	→	180 Ringing		
		200 OK	←		←	200 OK
		200 OK	→	200 OK		
				ACK	→	ACK
NOTIFY(200)	←		←	NOTIFY(200)		
200 OK NOTIFY	→		→	200 OK NOTIFY		

Communication ISC#2 with ISC#3

Apply post test routine

TSS	TP	Reference	Selection expression
Netw/TransferorAS	ECT_N01_004	4.5.2.4	PICS 4.5.1/2 AND PICS 4.7.1/1 AND NOT (PICS 4.7.1/4 OR PICS 4.7.1/5)

Test purpose

Communication transfer: ***Blind transfer****. Transferee was originator of the originating call.*

Ensure that a Transferor can successfully transfer the communication with the transferee set on hold before and the Transferor is notified about the processing. After the REFER request to the Transferee is sent, the communication between Transferor and Transferee is terminated. The Transferee was the initiator of the originating communication.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI; method=invite
Referred-By contains **ISC#1** URI
REFER 2: Refer-To contains **ECT Session Identifier** URI; method=invite
Referred-By contains **ISC#1** URI
INVITE 3: Request URI = **ECT Session Identifier** URI
INVITE 4: Request URI = **ISC#3** URI
NOTIFY(100):Event contains **refer**
Subscription-State: **active;expires=(any value)**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**
Subscription-State: terminated;reason=noresource

Comments:

ISC#1		AS Transferor		ISC#2		ISC#3
INVITE	←		←	INVITE 1		
180 Ringing	→		→	180 Ringing		
200 OK (INVITE)	→		→	200 OK (INVITE)		
ACK	←		←	ACK		
INVITE 2 (sendonly)	→		→	INVITE (sendonly)		
200 OK (recvonly)	←		←	200 OK (recvonly)		
ACK	→		→	ACK		
REFER 1	→	REFER				
			→	REFER 2		
		202 Accepted	←	202 Accepted		
202 Accepted	←	202 Accepted				
BYE	→		→	BYE		
200 OK (BYE)	←		←	200 OK (BYE)		
NOTIFY(100)	←		←	NOTIFY(100)		
200 OK NOTIFY	→		→	200 OK NOTIFY		
		INVITE	←	INVITE 3		
		INVITE 4	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		180 Ringing	→	180 Ringing		
		200 OK	←		←	200 OK
		200 OK	→	200 OK		
				ACK	→	ACK
NOTIFY(200)	←		←	NOTIFY(200)		
200 OK NOTIFY	→		→	200 OK NOTIFY		

Communication ISC#2 with ISC#3

Apply post test routine

TSS	TP	Reference	Selection expression
Netw/TransferorAS	ECT_N01_005	4.5.2.4	PICS 4.5.1/2 AND PICS 4.7.1/3 AND NOT (PICS 4.7.1/4 OR PICS 4.7.1/5)

Test purpose

Communication transfer: ***Consultative transfer****. Transferor was originator of the originating call.*

Ensure that a Transferor can successfully transfer the communication with the transferee set on hold before and the Transferor is notified about the processing. The Transferor has a session with Transferee and the Transfer target set on hold. The Transferor refers the Transferee to establish a session to the Transfer target. After the successful session between Transferee and Transfer target, the sessions of the Transferor are released by the Transferor. The Transferor was the initiator of the originating communication.

SIP header values:

REFER 1: Refer-To contains **ISC#3 URI**; method=invite?Replaces=**call-id1**%3B**to-tag**%3D**S1**%3B
from-tag%3D**S1**&Require=replaces
Referred-By contains **ISC#1** URI
REFER 2: Refer-To contains **ECT Session Identifier URI**;method=invite
Referred-By contains **ISC#1** URI
INVITE 3: Request URI = **ECT Session Identifier** URI Referred-By contains **ISC#1** URI
INVITE 4: Request URI = **ISC#3** URI;
Replaces: **call-id1**;**to-tag=S1**;**from-tag=S1**
Require: replaces
Referred-By contains **ISC#1** URI
NOTIFY(100):Event contains **refer**;
Subscription-State: **active;expires=(any value)**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**;
message/sipfrag contains **SIP/2.0 200 OK**
Subscription-State: terminated;reason=noresource

Comments:

ISC#1		**AS Transferor**		**ISC#2**		**ISC#3**
INVITE 1	→		→	INVITE		
180 Ringing	←		←	180 Ringing		
200 OK (INVITE)	←		←	200 OK (INVITE)		
ACK	→		→	ACK		
INVITE (sendonly)	→		→	INVITE (sendonly)		
200 OK (recvonly)	←		←	200 OK (recvonly)		
ACK	→		→	ACK		
INVITE 2	→				→	INVITE
180 Ringing	←				←	180 Ringing
200 OK (INVITE)	←				←	200 OK (INVITE)
ACK	→				→	ACK
INVITE (sendonly)	→				→	INVITE (sendonly)
200 OK (recvonly)	←				←	200 OK (recvonly)
ACK	→				→	ACK
REFER 1	→	REFER				
		REFER 2	→	REFER		
		202 Accepted	←	202 Accepted		
202 Accepted	←	202 Accepted				
INVITE (inactive)	←		←	INVITE (inactive)		
200 OK (inactive)	→		→	200 OK (inactive)		
ACK	←		←	ACK		
NOTIFY(100)	←		←	NOTIFY(100)		
200 OK NOTIFY	→		→	200 OK NOTIFY		
		INVITE	←	INVITE 3		
		INVITE 4	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		180 Ringing	→	180 Ringing		
		200 OK	←		←	200 OK
		200 OK	→	200 OK		
				ACK	→	ACK
NOTIFY(200)	←		←	NOTIFY(200)		

TSS	**TP**	**Reference**	**Selection expression**
Netw/TransferorAS	ECT_N01_005	4.5.2.4	PICS 4.5.1/2 AND PICS 4.7.1/3 AND NOT (PICS 4.7.1/4 OR PICS 4.7.1/5)

200 OK NOTIFY	→	→	200 OK NOTIFY	
BYE	←			← BYE
200 OK (BYE)	→			→ 200 OK (BYE)
BYE	→			→ BYE
200 OK (BYE)	←			← 200 OK (BYE)
				Communication ISC#2 with ISC#3
		Apply post test routine		

TSS	TP	Reference	Selection expression
Netw/TransferorAS	ECT_N01_006	4.5.2.4	PICS 4.5.1/2 AND PICS 4.7.1/3 AND NOT (PICS 4.7.1/4 OR PICS 4.7.1/5)

Test purpose

Communication transfer: ***Consultative transfer****. Transferee was originator of the originating call.*

Ensure that a Transferor can successfully transfer the communication with the transferee set on hold before and the Transferor is notified about the processing. The Transferor has a session with Transferee and the Transfer target. The Transferor refers the Transferee to establish a session to the Transfer target. After the successful session between Transferee and Transfer target set on hold, the sessions of the Transferor are released by the Transferor. The Transferee was the initiator of the originating communication.

SIP header values:

REFER 1: Refer-To contains **ISC#3 URI;** method=invite?Replaces=**call-id1**%3B
to-tag%3D**S1**%3B**from-tag**%3D**S1**&Require=replaces
Referred-By contains **ISC#1** URI
REFER 2: Refer-To contains **ECT Session Identifier URI;** method=invite
Referred-By contains **ISC#1** URI
INVITE 3: Request URI = **ECT Session Identifier** URI
Referred-By contains **ISC#1** URI
INVITE 4: Request URI = **ISC#3** URI
Replaces=**call-id1**;**to-tag=S1**; **from-tag=S1**
Require: replaces
Referred-By contains **ISC#1** URI
NOTIFY(100): Event contains **refer**
Subscription-State: **active;expires=(any value)**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200): Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**
Subscription-State: terminated;reason=noresource

Comments:

ISC#1		AS Transferor		ISC#2		ISC#3
INVITE	←		←	INVITE 1		
180 Ringing	→		→	180 Ringing		
200 OK (INVITE)	→		→	200 OK (INVITE)		
ACK	←		←	ACK		
INVITE (sendonly)	→		→	INVITE (sendonly)		
200 OK (recvonly)	←		←	200 OK (recvonly)		
ACK	→		→	ACK		
INVITE 2	→				→	INVITE
180 Ringing	←				←	180 Ringing
200 OK (INVITE)	←				←	200 OK (INVITE)
ACK	→				→	ACK
INVITE (sendonly)	→				→	INVITE (sendonly)
200 OK (recvonly)	←				←	200 OK (recvonly)
ACK	→				→	ACK
REFER 1	→	REFER				
			→	REFER 2		
		202 Accepted	←	202 Accepted		
202 Accepted	←	202 Accepted				
INVITE (inactive)	←		←	INVITE (inactive)		
200 OK (inactive)	→		→	200 OK (inactive)		
ACK	←		←	ACK		
NOTIFY(100)	←		←	NOTIFY(100)		
200 OK NOTIFY	→		→	200 OK NOTIFY		
		INVITE	←	INVITE 3		
		INVITE 4	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		180 Ringing	→	180 Ringing		
		200 OK	←		←	200 OK
		200 OK	→	200 OK		

TSS	**TP**	**Reference**	**Selection expression**
Netw/TransferorAS	ECT_N01_006	4.5.2.4	PICS 4.5.1/2 AND PICS 4.7.1/3 AND NOT (PICS 4.7.1/4 OR PICS 4.7.1/5)

			ACK →	ACK
NOTIFY(200)	←	←	NOTIFY(200)	
200 OK NOTIFY	→	→	200 OK NOTIFY	
BYE	←		←	BYE
200 OK (BYE)	→		→	200 OK (BYE)
BYE	→	→	BYE	
200 OK (BYE)	←	←	200 OK (BYE)	

Communication ISC#2 with ISC#3

Apply post test routine

TSS	**TP**	**Reference**	**Selection expression**
Netw/TransferorAS	ECT_N01_007	4.5.2.4.1.2.2	PICS 4.5.1/2

Test purpose

The method in the Refer-To header is not the 'INVITE' method.

Ensure that the REFER request is rejected if the Method in the Refer-To header used in this dialogue is not the INVITE method e.g. BYE.

SIP header values:

REFER: Refer-To contains **ISC#3** URI; method=BYE
Referred-By contains **ISC#1** URI

Comments:

ISC#1		**AS Transferor**		**ISC#2**	**ISC#3**
INVITE	→		→	INVITE	
180 Ringing	←		←	180 Ringing	
200 OK (INVITE)	←		←	200 OK (INVITE)	
ACK	→		→	ACK	
INVITE (sendonly)	→		→	INVITE (sendonly)	
200 OK (recvonly)	←		←	200 OK (recvonly)	
ACK	→		→	ACK	

ISC#1 transfers ISC#2 to ISC#3

REFER	→	REFER	
4xx or 5xx or 6xx Response	←	4xx or 5xx or 6xx Response	

Apply post test routine

TSS	TP	Reference	Selection expression
	ECT_N01_008	4.5.2.4.1.2.2	PICS 4.5.1/2

Test purpose
The request-URI is not targeted at the same UE instance that is involved in the dialog.
Ensure that the ECT simulation service does not apply if the Request URI is not the Transferee URI. The REFER request is rejected.

SIP header values:
REFER: Request URI contained the **other URI (PIXIT)**
Refer-To contains the URI of **ISC#3**, method=invite
Referred-By contains SIP or tel URI of **ISC#1**

Comments:

ISC#1		AS Transferor		ISC#2	ISC#3
INVITE	→		→	INVITE	
180 Ringing	←		←	180 Ringing	
200 OK (INVITE)	←		←	200 OK (INVITE)	
ACK	→		→	ACK	
INVITE (sendonly)	→		→	INVITE (sendonly)	
200 OK (recvonly)	←		←	200 OK (recvonly)	
ACK	→		→	ACK	
REFER	→	REFER			
4xx or 5xx or 6xx Response	←	4xx or 5xx or 6xx Response			
		Apply post test routine			

TSS	TP	Reference	Selection expression
Netw/TransferorAS	ECT_N01_009	4.5.2.4.1.2.2	PICS 4.5.1/2

Test purpose
There is no method parameter contained in the Refer-To header.
Ensure that the REFER request is rejected if there is no Method parameter contained in the Refer-To header.

SIP header values:
REFER: Refer-To To contains **ISC#3** URI (no method parameter)
Referred-By contains **ISC#1** URI

Comments:

ISC#1		AS Transferor		ISC#2	ISC#3
INVITE	→		→	INVITE	
180 Ringing	←		←	180 Ringing	
200 OK (INVITE)	←		←	200 OK (INVITE)	
ACK	→		→	ACK	
INVITE (sendonly)	→		→	INVITE (sendonly)	
200 OK (recvonly)	←		←	200 OK (recvonly)	
ACK	→		→	ACK	
		ISC#1 transfers ISC#2 to ISC#3			
REFER	→	REFER			
4xx or 5xx or 6xx Response	←	4xx or 5xx or 6xx Response			
		Apply post test routine			

TSS	TP	Reference	Selection expression
Netw/TransferorAS	ECT_N01_010	4.5.2.4.2.3	PICS 4.5.1/2 AND NOT (PICS 4.7.1/4 OR PICS 4.7.1/5)

Test purpose

*In the **REFER** request, the Referred-By header does not contain the valid identity of the served user.*

A Referred-By header is available in the REFER request, the AS verifies if the provided Referred-By header contains a valid identity of the served user. If not it will replace the Referred-By header with a valid value matching the REFER request's P-Asserted-Identity.

SIP header values:

REFER 1: Request URI: **ISC#2**
Referred-By contains **ISC#x** URI (PIXIT any value)
P-Asserted-Identity=**ISC#1**

REFER 1: Request URI: **ISC#2**
Referred-By contains **ISC#1** URI

Comments:

ISC#1		AS Transferor		ISC#2		ISC#3
		Establishment of session #1				
		Session #1 on hold				
		Establishment of session #2				
		Session #2 on hold				
		ISC#1 transfers ISC#2 to ISC#3				
REFER 1	→	REFER				
		REFER 2	→	REFER		
		202 Accepted	←	202 Accepted		
202 Accepted	←	202 Accepted				
INVITE (inactive)	←		←	INVITE (inactive)		
200 OK (inactive)	→		→	200 OK (inactive)		
ACK	←		←	ACK		
NOTIFY(100)	←		←	NOTIFY(100)		
200 OK NOTIFY	→		→	200 OK NOTIFY		
		INVITE	←	INVITE 3		
		INVITE 4	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		180 Ringing	→	180 Ringing		
		200 OK	←		←	200 OK
		200 OK	→	200 OK		
				ACK	→	ACK
NOTIFY(200)	←		←	NOTIFY(200)		
200 OK NOTIFY	→		→	200 OK NOTIFY		
BYE	→		→	BYE		
200 OK (BYE)	←		←	200 OK (BYE)		
		Apply post test routine				

TSS	TP	Reference	Selection expression
Netw/TransferorAS	ECT_N01_011	4.5.2.4.2.3	PICS 4.5.1/2 AND NOT (PICS 4.7.1/4 OR PICS 4.7.1/5)

Test purpose

*The **REFER** request does not contain a Referred-By header.*

If no Referred-By header is available in the REFER request a Referred-By header is added that matches the REFER method's P-Asserted-Identity.

SIP header values:

REFER 1: Request URI: **ISC#2**
Referred-By not present
P-Asserted-Identity=**ISC#1**

REFER 1: Request URI: **ISC#2**
Referred-By contains **ISC#1** URI

Comments:

ISC#1		AS Transferor		ISC#2		ISC#3
		Establishment of session #1				
	Session #1 on hold					
		Establishment of session #2				
	Session #2 on hold					
		ISC#1 transfers ISC#2 to ISC#3				
REFER 1	→	REFER				
		REFER 2	→	REFER		
		202 Accepted	←	202 Accepted		
202 Accepted	←	202 Accepted				
INVITE (inactive)	←		←	INVITE (inactive)		
200 OK (inactive)	→		→	200 OK (inactive)		
ACK	←		←	ACK		
NOTIFY(100)	←		←	NOTIFY(100)		
200 OK NOTIFY	→		→	200 OK NOTIFY		
		INVITE	←	INVITE 3		
		INVITE 4	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		180 Ringing	→	180 Ringing		
		200 OK	←		←	200 OK
		200 OK	→	200 OK		
				ACK	→	ACK
NOTIFY(200)	←		←	NOTIFY(200)		
200 OK NOTIFY	→		→	200 OK NOTIFY		
BYE	→		→	BYE		
200 OK (BYE)	←		←	200 OK (BYE)		
		Apply post test routine				

TSS	TP	Reference	Selection expression
Netw/TransferorAS	ECT_N01_012	4.5.2.4.2.1	PICS 4.5.1/2 AND NOT (PICS 4.7.1/4 OR PICS 4.7.1/5)

Test purpose

*The Referred-By header in the received **INVITE** does not contain the valid identity of the served user.*

If a Referred-By header is available in the INVITE request, the AS verifies if the provided Referred-By header contains a valid identity of the served user. If not it will replace the Referred-By header with a valid value matching the REFER request's P-Asserted-Identity.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI; method=invite
P-Asserted-Identity=**ISC#1**
INVITE 3: Request URI = **ECT Session Identifier** URI
Referred-By contains **ISC#x** URI (PIXIT any value)
INVITE 4: Request URI = **ISC#3** URI
Referred-By contains **ISC#1** URI

Comments:

ISC#1		AS Transferor		ISC#2		ISC#3
		Establishment of session #1				
		Session #1 on hold				
		Establishment of session #2				
		Session #2 on hold				
		ISC#1 transfers ISC#2 to ISC#3				
REFER 1	→	REFER				
		REFER 2	→	REFER		
		202 Accepted	←	202 Accepted		
202 Accepted	←	202 Accepted				
INVITE (inactive)	←		←	INVITE (inactive)		
200 OK (inactive)	→		→	200 OK (inactive)		
ACK	←		←	ACK		
NOTIFY(100)	←		←	NOTIFY(100)		
200 OK NOTIFY	→		→	200 OK NOTIFY		
		INVITE	←	INVITE 3		
		INVITE 4	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		180 Ringing	→	180 Ringing		
		200 OK	←		←	200 OK
		200 OK	→	200 OK		
				ACK	→	ACK
NOTIFY(200)	←		←	NOTIFY(200)		
200 OK NOTIFY	→		→	200 OK NOTIFY		
		Apply post test routine				

TSS	TP	Reference	Selection expression
Netw/TransferorAS	ECT_N01_013	4.5.2.4.2.1	PICS 4.5.1/2 AND NOT (PICS 4.7.1/4 OR PICS 4.7.1/5)

Test purpose

*The received **INVITE** does not contain a Referred-By header.*

If no Referred-By header is available in the INVITE request a Referred-By header is added that matches the REFER request's P-Asserted-Identity.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI; method=invite
P-Asserted-Identity=**ISC#1**
INVITE 3: Request URI = **ECT Session Identifier** URI
Referred-By not present
INVITE 4: Request URI = **ISC#3** URI
Referred-By contains **ISC#1** URI

Comments:

ISC#1		**AS Transferor**		**ISC#2**		**ISC#3**
		Establishment of session #1				
	Session #1 on hold					
		Establishment of session #2				
	Session #2 on hold					
		ISC#1 transfers ISC#2 to ISC#3				
REFER 1	→	REFER				
		REFER 2	→	REFER		
		202 Accepted	←	202 Accepted		
202 Accepted	←	202 Accepted				
INVITE (inactive)	←		←	INVITE (inactive)		
200 OK (inactive)	→		→	200 OK (inactive)		
ACK	←		←	ACK		
NOTIFY(100)	←		←	NOTIFY(100)		
200 OK NOTIFY	→		→	200 OK NOTIFY		
		INVITE	←	INVITE 3		
		INVITE 4	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		180 Ringing	→	180 Ringing		
		200 OK	←		←	200 OK
		200 OK	→	200 OK		
				ACK	→	ACK
NOTIFY(200)	←		←	NOTIFY(200)		
200 OK NOTIFY	→		→	200 OK NOTIFY		
BYE	→		→	BYE		
200 OK (BYE)	←		←	200 OK (BYE)		
		Apply post test routine				

TSS	TP	Reference	Selection expression
Netw/TransferorAS	ECT_N01_014	4.5.2.4.1.2.3, 4.7.2.9.7/ [3]	PICS 4.5.1/2 AND PICS 4.7.1/2 AND PICS 4.7.1/4

Test purpose

Assured transfer*. The Transferor AS receives a 403 Forbidden indicating the Transferee does not support the REFER method.*

Ensure that three party call control applies at the Transferor AS when a 403 Forbidden is received upon a REFER was sent to the Transferee:

- A 202 Accepted for the REFER is sent.
- A NOTIFY containing a message/sipfrag body set to 'SIP/2.0 100 Trying' if the REFER request is accepted.
- An INVITE is sent to the Transfer Target containing the P-Asserted_identity of the Transferee and the Referred-By header with the identity of the Transferor.
- After the 200 OK is received, a reINVITE is sent to the Transferee containing the P-Asserted_identity of the Transfer Target and the Referred-By header with the identity of the Transferor.
- A NOTIFY containing a message/sipfrag body set to 'SIP/2.0 200 OK' if the refered communication is established.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI; method=invite
Referred-By contains **ISC#1** URI
INVITE 3: Request URI = **ISC#3**, P-Asserted-Identity=ISC#2, Referred-By=ISC#1
INVITE 4: Request URI = **ISC#2**, P-Asserted-Identity=ISC#3, Referred-By=ISC#1
NOTIFY(100):Event contains **refer**
Subscription-State: **active;expires=(any value)**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**
Subscription-State: terminated;reason=noresource

Comments:

ISC#1		**AS Transferor**	**ISC#2**		**ISC#3**
		Establishment of session #1			
		Session #1 on hold			
REFER 1	→	REFER			
		REFER	→ REFER		
		403 Forbidden	← 403 Forbidden		
202 Accepted	←	202 Accepted			
		3 party call control applies			
		INVITE 3	→	→	INVITE
		180 Ringing	←	←	180 Ringing
		200 OK	←	←	200 OK
		ACK	→	→	ACK
NOTIFY(100)	←	NOTIFY(100)			
200 OK NOTIFY	→	200 OK NOTIFY			
		INVITE 4	→ INVITE		
		200 OK	← 200 OK		
		ACK	→ ACK		
NOTIFY(200)	←	NOTIFY(200)			
200 OK NOTIFY	→	200 OK NOTIFY			
BYE	→	BYE			
200 OK (BYE)	←	200 OK (BYE)			
		Apply post test routine			

TSS	TP	Reference	Selection expression
Netw/TransferorAS	ECT_N01_015	4.5.2.4.1.2.3, 4.7.2.9.7/ [3]	PICS 4.5.1/2 AND PICS 4.7.1/1 AND PICS 4.7.1/4

Test purpose

Blind transfer*. The Transferor AS receives a 403 Forbidden indicating the Transferee does not support the REFER method.*

Ensure that three party call control applies at the Transferor AS when a 403 Forbidden is received upon a REFER was sent to the Transferee:

- A 202 Accepted for the REFER is sent.
- A NOTIFY containing a message/sipfrag body set to 'SIP/2.0 100 Trying' if the REFER request is accepted.
- An INVITE is sent to the Transfer Target containing the P-Asserted_identity of the Transferee and the Referred-By header with the identity of the Transferor.
- After the 200 OK is received, a reINVITE is sent to the Transferee containing the P-Asserted_identity of the Transfer Target and the Referred-By header with the identity of the Transferor.
- A NOTIFY containing a message/sipfrag body set to 'SIP/2.0 200 OK' if the refered communication is established.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI; method=invite
Referred-By contains **ISC#1** URI
INVITE 3: Request URI = **ISC#3**, P-Asserted-Identity=ISC#2, Referred-By=ISC#1
INVITE 4: Request URI = **ISC#2**, P-Asserted-Identity=ISC#3, Referred-By=ISC#1
NOTIFY(100):Event contains **refer**
Subscription-State: **active;expires=(any value)**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**
Subscription-State: terminated;reason=noresource

Comments:

ISC#1		AS Transferor		ISC#2		ISC#3
		Establishment of session #1				
		Session #1 on hold				
REFER 1	→	REFER				
		REFER	→	REFER		
		403 Forbidden	←	403 Forbidden		
202 Accepted	←	202 Accepted				
BYE	→					
200 OK (BYE)	←					
		3 party call control applies				
		INVITE 3	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		200 OK	←		←	200 OK
		ACK	→		→	ACK
NOTIFY(100)	←					
200 OK NOTIFY	→					
		INVITE 4	→	INVITE		
		200 OK	←	200 OK		
		ACK	→	ACK		
NOTIFY(200)	←	NOTIFY(200)				
200 OK NOTIFY	→	200 OK NOTIFY				
		Apply post test routine				

TSS	TP	Reference	Selection expression
Netw/TransferorAS	ECT_N01_016	4.5.2.4.1.2.3, 4.7.2.9.7/ [3]	PICS 4.5.1/2 AND PICS 4.7.1/3 AND PICS 4.7.1/4

Test purpose

Consultative transfer*. The Transferor AS receives a 403 Forbidden indicating the Transferee does not support the REFER method.*

Ensure that three party call control applies at the Transferor AS when a 403 Forbidden is received upon a REFER was sent to the Transferee:

- A 202 Accepted for the REFER is sent.
- A NOTIFY containing a message/sipfrag body set to 'SIP/2.0 100 Trying' if the REFER request is accepted
- A reINVITE is sent to the Transfer Target containing the P-Asserted_identity of the Transferee and the Referred-By header with the identity of the Transferor.
- After the 200 OK is received, a reINVITE is sent to the Transferee containing the P-Asserted_identity of the Transfer Target and the Referred-By header with the identity of the Transferor.
- A NOTIFY containing a message/sipfrag body set to 'SIP/2.0 200 OK' if the refered communication is established.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI;method=invite?Replaces=**call-id1**%3B**to-tag**%3D**S1**%3B
from-tag%3D**S1**&Require=replaces
Referred-By contains **ISC#1** URI
INVITE 3: Request URI = **ISC#3**, P-Asserted-Identity=ISC#2, Referred-By=ISC#1
INVITE 4: Request URI = **ISC#2,** P-Asserted-Identity=ISC#3, Referred-By=ISC#1
NOTIFY(100):Event contains **refer**
Subscription-State: **active;expires=(any value)**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**
Subscription-State: terminated;reason=noresource

Comments:

ISC#1		AS Transferor		ISC#2		ISC#3
		Establishment of session #1				
		Session #1 on hold				
		Establishment of session #2				
		Session #2 on hold				
REFER 1	→	REFER				
		REFER	→	REFER		
		403 Forbidden	←	403 Forbidden		
202 Accepted	←	202 Accepted				
		3 party call control applies				
		INVITE 3	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		200 OK	←		←	200 OK
		ACK	→		→	ACK
NOTIFY(100)	←	NOTIFY(100)				
200 OK NOTIFY	→	200 OK NOTIFY				
		INVITE 4	→	INVITE		
		200 OK	←	200 OK		
		ACK	→	ACK		
NOTIFY(200)	←	NOTIFY(200)				
200 OK NOTIFY	→	200 OK NOTIFY				
BYE(S1)	→	BYE				
200 OK (BYE)	←	200 OK (BYE)				
BYE	←	BYE(S2)				
200 OK (BYE)	→	200 OK (BYE)				
		Apply post test routine				

TSS	TP	Reference	Selection expression
Netw/TransferorAS	ECT_N01_017	4.5.2.4.1.2.3, 4.7.2.9.7/ [3]	PICS 4.5.1/2 AND PICS 4.7.1/2 AND PICS 4.7.1/4

Test purpose

Assured transfer*. The Transferor AS receives a 501 Not implemented indicating the Transferee does not support the REFER method.*

Ensure that three party call control applies at the Transferor AS when a 501 Not implemented is received upon a REFER was sent to the Transferee:

- A 202 Accepted for the REFER is sent.
- An INVITE is sent to the Transfer Target containing the P-Asserted_identity of the Transferee and the Referred-By header with the identity of the Transferor.
- After the 200 OK is received, a reINVITE is sent to the Transferee containing the P-Asserted_identity of the Transfer Target and the Referred-By header with the identity of the Transferor.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI; method=invite
Referred-By contains **ISC#1** URI
INVITE 3: Request URI = **ISC#3**, P-Asserted-Identity=ISC#2, Referred-By=ISC#1
INVITE 4: Request URI = **ISC#2**, P-Asserted-Identity=ISC#3, Referred-By=ISC#1
NOTIFY(100):Event contains **refer**
Subscription-State: **active;expires=(any value)**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**
Subscription-State: terminated;reason=noresource

Comments:

ISC#1		AS Transferor		ISC#2		ISC#3
		Establishment of session #1				
		Session #1 on hold				
REFER 1	→	REFER				
		REFER	→	REFER		
		501 Not implemented	←	501 Not implemented		
202 Accepted	←	202 Accepted				
		3 party call control applies				
		INVITE 3	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		200 OK	←		←	200 OK
		ACK	→		→	ACK
NOTIFY(100)	←	NOTIFY(100)				
200 OK NOTIFY	→	200 OK NOTIFY				
		INVITE 4	→	INVITE		
		200 OK	←	200 OK		
		ACK	→	ACK		
NOTIFY(200)	←	NOTIFY(200)				
200 OK NOTIFY	→	200 OK NOTIFY				
BYE	→	BYE				
200 OK (BYE)	←	200 OK (BYE)				
		Apply post test routine				

TSS	TP	Reference	Selection expression
Netw/TransferorAS	ECT_N01_018	4.5.2.4.1.2.3, 4.7.2.9.7/ [3]	PICS 4.5.1/2 AND PICS 4.7.1/1 AND PICS 4.7.1/4

Test purpose

Blind transfer*. The Transferor AS receives a 501 Not implemented indicating the Transferee does not support the REFER method.*

Ensure that three party call control applies at the Transferor AS when a 501 Not implemented is received upon a REFER was sent to the Transferee:

- A 202 Accepted for the REFER is sent.
- An INVITE is sent to the Transfer Target containing the P-Asserted_identity of the Transferee and the Referred-By header with the identity of the Transferor.
- After the 200 OK is received, a reINVITE is sent to the Transferee containing the P-Asserted_identity of the Transfer Target and the Referred-By header with the identity of the Transferor.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI; method=invite
Referred-By contains **ISC#1** URI
INVITE 3: Request URI = **ISC#3**, P-Asserted-Identity=ISC#2, Referred-By=ISC#1
INVITE 4: Request URI = **ISC#2**, P-Asserted-Identity=ISC#3, Referred-By=ISC#1
NOTIFY(100):Event contains **refer**
Subscription-State: **active;expires=(any value)**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**
Subscription-State: terminated;reason=noresource

Comments:

ISC#1		AS Transferor		ISC#2		ISC#3
		Establishment of session #1				
		Session #1 on hold				
REFER 1	→	REFER				
		REFER	→	REFER		
		501 Not implemented	←	501 Not implemented		
202 Accepted	←	202 Accepted				
BYE	→					
200 OK (BYE)	←					
		3 party call control applies				
		INVITE 3	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		200 OK	←		←	200 OK
		ACK	→		→	ACK
NOTIFY(100)	←					
200 OK NOTIFY	→					
		INVITE 4	→	INVITE		
		200 OK	←	200 OK		
		ACK	→	ACK		
NOTIFY(200)	←	NOTIFY(200)				
200 OK NOTIFY	→	200 OK NOTIFY				
		Apply post test routine				

TSS	TP	Reference	Selection expression
Netw/TransferorAS	ECT_N01_019	4.5.2.4.1.2.3, 4.7.2.9.7/ [3]	PICS 4.5.1/2 AND PICS 4.7.1/3 AND PICS 4.7.1/4

Test purpose

Consultative transfer*. The Transferor AS receives a 501 Not implemented indicating the Transferee does not support the REFER method.*

Ensure that three party call control applies at the Transferor AS when a 501 Not implemented is received upon a REFER was sent to the Transferee:

- A 202 Accepted for the REFER is sent.
- A reINVITE is sent to the Transfer Target containing the P-Asserted_identity of the Transferee and the Referred-By header with the identity of the Transferor.
- After the 200 OK is received, a reINVITE is sent to the Transferee containing the P-Asserted_identity of the Transfer Target and the Referred-By header with the identity of the Transferor.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI;method=invite?Replaces=**call-id1**%3B**to-tag**%3D**S1**%3B
from-tag%3D**S1**&Require=replaces
Referred-By contains **ISC#1** URI
INVITE 3: Request URI = **ISC#3**, P-Asserted-Identity=ISC#2, Referred-By=ISC#1
INVITE 4: Request URI = **ISC#2,** P-Asserted-Identity=ISC#3, Referred-By=ISC#1
NOTIFY(100):Event contains **refer**
Subscription-State: **active;expires=(any value)**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**
Subscription-State: terminated;reason=noresource

Comments:

ISC#1		AS Transferor		ISC#2		ISC#3
		Establishment of session #1				
		Session #1 on hold				
		Establishment of session #2				
		Session #2 on hold				
REFER 1	→	REFER				
			REFER	→	REFER	
			501 Not implemented	←	501 Not implemented	
202 Accepted	←	202 Accepted				
			3 party call control applies			
			INVITE 3	→		→ INVITE
			180 Ringing	←		← 180 Ringing
			200 OK	←		← 200 OK
			ACK	→		→ ACK
NOTIFY(100)	←	NOTIFY(100)				
200 OK NOTIFY	→	200 OK NOTIFY				
			INVITE 4	→	INVITE	
			200 OK	←	200 OK	
			ACK	→	ACK	
NOTIFY(200)	←	NOTIFY(200)				
200 OK NOTIFY	→	200 OK NOTIFY				
BYE(S1)	→	BYE				
200 OK (BYE)	←	200 OK (BYE)				
BYE	←	BYE(S2)				
200 OK (BYE)	→	200 OK (BYE)				
		Apply post test routine				

TSS	TP	Reference	Selection expression
Netw/TransferorAS	ECT_N01_020	4.5.2.4.1.2.3, 4.7.2.9.7/ [3]	PICS 4.5.1/2 AND PICS 4.7.1/2 AND PICS 4.7.1/5

Test purpose

Assured transfer*. The Transferor AS initiate the special REFER handling procedures directly.*

Ensure that three party call control applies directly at the Transferor AS when the AS has prior **knowledge** that **the Transferee is not allowed** to receive or **does not support the REFER method**:

- A 202 Accepted for the REFER is sent.
- A NOTIFY request is sent to the Transferor containing a message/sipfrag body set to 'SIP/2.0 100 Trying' after the REFER request is accepted.
- An INVITE is sent to the Transfer Target containing the P-Asserted_identity of the Transferee and the Referred-By header with the identity of the Transferor.
- After the 200 OK is received, a reINVITE is sent to the Transferee containing the P-Asserted_identity of the Transfer Target and the Referred-By header with the identity of the Transferor.
- A NOTIFY request is sent to the Transferor containing a message/sipfrag body set to 'SIP/2.0 200 OK' after the referred communication is confirmed.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI; method=invite
Referred-By contains **ISC#1** URI
INVITE 3: Request URI = **ISC#3**, P-Asserted-Identity=ISC#2, Referred-By=ISC#1
INVITE 4: Request URI = **ISC#2**, P-Asserted-Identity=ISC#3, Referred-By=ISC#1
NOTIFY(100):Event contains **refer**
Subscription-State: **active;expires=(any value)**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**
Subscription-State: terminated;reason=noresource

Comments:

ISC#1		AS Transferor		ISC#2		ISC#3
		Establishment of session #1				
		Session #1 on hold				
REFER 1	→	REFER				
202 Accepted	←	202 Accepted				
			3 party call control applies			
			INVITE 3	→		→ INVITE
			180 Ringing	←		← 180 Ringing
			200 OK	←		← 200 OK
			ACK	→		→ ACK
NOTIFY(100)	←	NOTIFY(100)				
200 OK NOTIFY	→	200 OK NOTIFY				
			INVITE 4	→	INVITE	
			200 OK	←	200 OK	
			ACK	→	ACK	
NOTIFY(200)	←	NOTIFY(200)				
200 OK NOTIFY	→	200 OK NOTIFY				
BYE	→	BYE				
200 OK (BYE)	←	200 OK (BYE)				
		Apply post test routine				

TSS	TP	Reference	Selection expression
Netw/TransferorAS	ECT_N01_021	4.5.2.4.1.2.3, 4.7.2.9.7/ [3]	PICS 4.5.1/2 AND PICS 4.7.1/1 AND PICS 4.7.1/5

Test purpose

Blind transfer*. The Transferor AS initiate the special REFER handling procedures directly.*

Ensure that three party call control applies directly at the Transferor AS when the AS has prior **knowledge** that **the Transferee is not allowed** to receive or **does not support the REFER method**:

- A 202 Accepted for the REFER is sent.
- A NOTIFY request is sent to the Transferor containing a message/sipfrag body set to 'SIP/2.0 100 Trying' after the REFER request is accepted.
- An INVITE is sent to the Transfer Target containing the P-Asserted_identity of the Transferee and the Referred-By header with the identity of the Transferor.
- After the 200 OK is received, a reINVITE is sent to the Transferee containing the P-Asserted_identity of the Transfer Target and the Referred-By header with the identity of the Transferor.
- A NOTIFY request is sent to the Transferor containing a message/sipfrag body set to 'SIP/2.0 200 OK' after the referred communication is confirmed.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI; method=invite
Referred-By contains **ISC#1** URI
INVITE 3: Request URI = **ISC#3**, P-Asserted-Identity=ISC#2, Referred-By=ISC#1
INVITE 4: Request URI = **ISC#2**, P-Asserted-Identity=ISC#3, Referred-By=ISC#1
NOTIFY(100):Event contains **refer**
Subscription-State: **active;expires=(any value)**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**
Subscription-State: terminated;reason=noresource

Comments:

ISC#1		**AS Transferor**		**ISC#2**		**ISC#3**
		Establishment of session #1				
		Session #1 on hold				
REFER 1	→	REFER				
202 Accepted	←	202 Accepted				
BYE	→					
200 OK (BYE)	←					
		3 party call control applies				
		INVITE 3	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		200 OK	←		←	200 OK
NOTIFY(100)	←					
200 OK NOTIFY	→					
		ACK	→		→	ACK
		INVITE 4	→	INVITE		
		200 OK	←	200 OK		
		ACK	→	ACK		
NOTIFY(200)	←	NOTIFY(200)				
200 OK NOTIFY	→	200 OK NOTIFY				
		Apply post test routine				

TSS	TP	Reference	Selection expression
Netw/TransferorAS	ECT_N01_022	4.5.2.4.1.2.3, 4.7.2.9.7/ [3]	PICS 4.5.1/2 AND PICS 4.7.1/3 AND PICS 4.7.1/5

Test purpose

Consultative transfer*. The Transferor AS initiate the special REFER handling procedures directly.*

Ensure that three party call control applies directly at the Transferor AS when the AS has prior **knowledge** that **the Transferee is not allowed** to receive or **does not support the REFER method**:

- A 202 Accepted for the REFER is sent.
- A NOTIFY request is sent to the Transferor containing a message/sipfrag body set to 'SIP/2.0 100 Trying' after the REFER request is accepted.
- A reINVITE is sent to the Transfer Target containing the P-Asserted_identity of the Transferee and the Referred-By header with the identity of the Transferor.
- After the 200 OK is received, a reINVITE is sent to the Transferee containing the P-Asserted_identity of the Transfer Target and the Referred-By header with the identity of the Transferor.
- A NOTIFY request is sent to the Transferor containing a message/sipfrag body set to 'SIP/2.0 200 OK' after the referred communication is confirmed.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI; method=invite
Referred-By contains **ISC#1** URI
INVITE 3: Request URI = **ISC#3**, P-Asserted-Identity=ISC#2, Referred-By=ISC#1
INVITE 4: Request URI = **ISC#2,** P-Asserted-Identity=ISC#3, Referred-By=ISC#1
NOTIFY(100):Event contains **refer**
Subscription-State: **active;expires=(any value)**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**
Subscription-State: terminated;reason=noresource

Comments:

ISC#1	AS Transferor	ISC#2	ISC#3
	Establishment of session #1		
	Session #1 on hold		
	Establishment of session #2		
REFER 1	→ REFER		
202 Accepted	← 202 Accepted		
	3 party call control applies		
	INVITE 3 →		→ INVITE
	180 Ringing ←		← 180 Ringing
	200 OK ←		← 200 OK
	ACK →		→ ACK
NOTIFY(100)	← NOTIFY(100)		
200 OK NOTIFY	→ 200 OK NOTIFY		
	INVITE 4 →	INVITE	
	200 OK ←	200 OK	
	ACK →	ACK	
NOTIFY(200)	← NOTIFY(200)		
200 OK NOTIFY	→ 200 OK NOTIFY		
BYE	→ BYE		
200 OK (BYE)	← 200 OK (BYE)		
BYE	← BYE		
200 OK (BYE)	→ 200 OK (BYE)		
	Apply post test routine		

5.2.3 Actions at the Transferee UE

TSS	**TP**	**Reference**	**Selection expression**
User/Transferee	ECT_U02_001	4.5.2.5	PICS 4.5.1/1 AND (PICS 4.6.1/1 OR PICS 4.6.1/2) AND PICS 4.6.1/5
Test purpose *The User Equipment receives the request to establish a communication to the transfer target (*Transferee *Blind/assured transfer)* Ensure that the UE establishes a session with a 'transfer target' if a REFER request was received containing a Refer-To header and a Referred-By header. The Request Line of INVITE request sent by the UE is set to the URI received in the Refer-To header. The received Referred-By header is sent in the INVITE request.Ensure that a NOTIFY request is sent containing a message/sipfrag body set to 'SIP/2.0 100 Trying' after the REFER request is accepted.Ensure that a NOTIFY request is sent containing a message/sipfrag body set to 'SIP/2.0 200 OK' after the referred communication is confirmed.			
SIP header values: REFER: Request URI: **Gm#1** Refer-To: contains **Gm#3** URI;method=invite Referred-By: contains **Gm#2** URI NOTIFY(100):Event contains **refer** Subscription-State: **active;expires=(any value)** message/sipfrag contains **SIP/2.0 100 Trying** NOTIFY(200):Event contains **refer** message/sipfrag contains **SIP/2.0 200 OK** INVITE: Request URI: **Gm#3** Referred-By contains **Gm#2** URI			

Comments:		
UE (Gm#1)		**Test equipment (Gm#2)**
	Establishment of session #1	
		Session #1 on hold
REFER	←	REFER
CASE A		
202 Accepted (Session #1)	→	202 Accepted
NOTIFY(100)	→	NOTIFY(100)
200 OK NOTIFY	←	200 OK NOTIFY
INVITE(inactive/sendonly) (**Session #1**)	→	INVITE
200 OK INVITE	←	200 OK INVITE(inactive/recvonly)
ACK	→	ACK
INVITE (**Session #2**)	→	INVITE
180 Ringing	←	180 Ringing
200 OK INVITE	←	200 OK INVITE
ACK	→	ACK
NOTIFY(200)	→	NOTIFY(200)
200 OK NOTIFY	←	200 OK NOTIFY
CASE B		
NOTIFY(100) (Session #1)	→	NOTIFY(100)
200 OK NOTIFY	←	200 OK NOTIFY
202 Accepted (Session #1)	→	202 Accepted
INVITE(inactive/sendonly) (**Session #1**)	→	INVITE
200 OK INVITE	←	200 OK INVITE(inactive/recvonly)
ACK	→	ACK
INVITE (**Session #2**)	→	INVITE
180 Ringing	←	180 Ringing
200 OK INVITE (Session #2)	←	200 OK INVITE
ACK	→	ACK
NOTIFY(200) (Session #1)	→	NOTIFY(200)
200 OK NOTIFY	←	200 OK NOTIFY
	Apply post test routine	

TSS	TP	Reference	Selection expression
User/Transferee	ECT_U02_002	4.5.2.5	PICS 4.5.1/1 AND PICS 4.6.1/3 AND PICS 4.6.1/5

Test purpose

*The User Equipment receives the request to establish a communication to the transfer target (*Transferee *consultative transfer)*

Ensure that the UE establishes a session with a 'transfer target' if a REFER request was received containing a Refer-To header and a Referred-By header. The Request Line of INVITE request sent by the UE is set to the URI received in the Refer-To header. The received Referred-By header is sent in the INVITE request. The Replaces header escaped in the received REFER request is sent in the INVITE request.

Ensure that a NOTIFY request is sent containing a message/sipfrag body set to 'SIP/2.0 100 Trying' after the REFER request is accepted.

Ensure that a NOTIFY request is sent containing a message/sipfrag body set to 'SIP/2.0 200 OK' after the referred communication is confirmed.

SIP header values:

REFER: Request URI: **Gm#1**
Refer-To: contains **Gm#3** URI; method=invite?**Replaces**=<any value>%3Bto-tag%3D<any To tag value>%3Bfrom-tag%3D<any From tag value>&Require=replaces
Referred-By: contains **Gm#2** URI
NOTIFY(100):Event contains **refer**
Subscription-State: **active;expires=(any value)**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**
INVITE: Request URI: **Gm#3**
Referred-By contains **Gm#2** URI
Replaces: <any value>;to-tag=<any To tag value>=from-tag=<any From tag value>
Require: contains **replaces**

Comments:

UE (Gm#1)		**Test equipment (Gm#2)**
	Establishment of session #1	
		Session #1 on hold
REFER	←	REFER
CASE A		
202 Accepted (Session #1)	→	202 Accepted
NOTIFY(100)	→	NOTIFY(100)
200 OK NOTIFY	←	200 OK NOTIFY
INVITE(inactive/sendonly) (**Session #1**)	→	INVITE
200 OK INVITE	←	200 OK INVITE(inactive/recvonly)
ACK	→	ACK
INVITE (**Session #2**)	→	INVITE
180 Ringing	←	180 Ringing
200 OK INVITE	←	200 OK INVITE
ACK	→	ACK
NOTIFY(200)	→	NOTIFY(200)
200 OK NOTIFY	←	200 OK NOTIFY
CASE B		
NOTIFY(100) (Session #1)	→	NOTIFY(100)
200 OK NOTIFY	←	200 OK NOTIFY
202 Accepted (Session #1)	→	202 Accepted
INVITE(inactive/sendonly) (**Session #1**)	→	INVITE
200 OK INVITE	←	200 OK INVITE(inactive/recvonly)
ACK	→	ACK
INVITE (**Session #2**)	→	INVITE
180 Ringing	←	180 Ringing
200 OK INVITE	←	200 OK INVITE
ACK	→	ACK
NOTIFY(200) (Session #1)	→	NOTIFY(200)
200 OK NOTIFY	←	200 OK NOTIFY
	Apply post test routine	

TSS	TP	Reference	Selection expression
User/Transferee	ECT_U02_003	4.5.2.5 [1]	PICS 4.5.1/1 AND NOT PICS 4.6.1/5

Test purpose

UE has not the capability to handle the REFER request.

Ensure that the UE is able to send a 403 Forbidden or 501 Not implemented unsuccessful final response if the REFER handling is not implemented.

SIP header values:

REFER: Request URI=Gm#1, Refer-To other URI (PIXIT); method=invite
Referred-By contains **Gm#2** URI

Comments:

UE (Gm#1)		**Test equipment (Gm#2)**
	Establishment of session #1	
	Session #1 on hold	
REFER	←	REFER
CASE A 403 Forbidden	→	403 Forbidden
CASE A 501 Not implemented	→	501 Not implemented
	Apply post test routine	

5.2.4 Action at the Transferee AS

TSS	**TP**	**Reference**	**Selection expression**
Netw/TransfereeAS	ECT_N02_001	4.5.2.7	PICS 4.5.1/2

Test purpose

Communication transfer: ***Assured transfer*** *applicable at the Transferee AS.*

Ensure that the Transferee AS can act as a proxy when receives the REFER request, the INVITE request and the BYE request for the call that is transferred as an assured transfer.

SIP header values:

REFER 1: Refer-To **ISC#3** URI; method=invite
Referred-By contains ISC#1 URI
REFER 2: Refer-To **ISC#3** URI; method=invite
Referred-By contains ISC#1 URI
INVITE 3: Request URI = **ISC#3**URI
INVITE 4: Request URI = **ISC#3** URI
NOTIFY(100):Event contains **refer**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**

Comments:

ISC#2		**AS Transferee**	**ISC#3**		**ISC#1**
		Establishment of session #1			
					Session #1 on hold
		ISC#1 transfers ISC#2 to ISC#3			
		REFER	←		← REFER 1
REFER	←	REFER 2			
202 Accepted	→	202 Accepted			
		202 Accepted	→		→ 202 Accepted
NOTIFY(100)	→				→ NOTIFY(100)
200 OK NOTIFY	←				← 200 OK NOTIFY
INVITE 3 (S2)	→	INVITE			
		INVITE 4	→	INVITE	
		180 Ringing	←	180 Ringing	
180 Ringing	←	180 Ringing			
			←	200 OK	
	200 OK ←	200 OK			
	ACK →		→	ACK	
NOTIFY(200)	→				→ NOTIFY(200)
200 OK NOTIFY	←				← 200 OK NOTIFY
BYE	←				← BYE (S1)
200 OK (BYE)	→				→ 200 OK (BYE)
		Apply post test routine			

TSS	TP	Reference	Selection expression
Netw/TransfereeAS	ECT_N02_002	4.5.2.7	PICS 4.5.1/2

Test purpose

Communication transfer: ***Blind transfer*** *applicable at the Transferee AS.*

Ensure that the Transferee AS can act as a proxy when receives the REFER request, the INVITE request and the BYE request for the call that is transferred as a blind transfer.

SIP header values:

REFER 1: Refer-To **ISC#3** URI;method=invite
Referred-By contains ISC#1 URI
REFER 2: Refer-To **ISC#3** URI;method=invite
Referred-By contains ISC#1 URI
INVITE 3: Request URI = **ISC#3** URI
INVITE 4: Request URI = **ISC#3** URI
NOTIFY(100):Event contains **refer**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**

Comments:

ISC#2		**AS Transferee**	**ISC#3**		**ISC#1**
		Establishment of session #1			
					Session #1 on hold
		ISC#1 transfers ISC#2 to ISC#3			
		REFER	←		← REFER 1
REFER	←	REFER 2			
202 Accepted	→	202 Accepted			
		202 Accepted	→		→ 202 Accepted
BYE	←				← BYE (S1)
200 OK (BYE)	→				→ 200 OK (BYE)
NOTIFY(100)	→				→ NOTIFY(100)
200 OK NOTIFY	←				← 200 OK NOTIFY
INVITE 3	→	INVITE			
		INVITE 4	→	INVITE	
		180 Ringing	←	180 Ringing	
180 Ringing	←	180 Ringing			
			←	200 OK	
200 OK	←	200 OK			
ACK	→		→	ACK	
NOTIFY(200)	→				→ NOTIFY(200)
200 OK NOTIFY	←				← 200 OK NOTIFY
		Apply post test routine			

TSS	**TP**	**Reference**	**Selection expression**
Netw/TransfereeAS	ECT_N02_003	4.5.2.7	PICS 4.5.1/2

Test purpose

Communication transfer: ***Consultative transfer*** *applicable at the Transferee AS.*

Ensure that the Transferee AS can act as a proxy when receives the REFER request, the INVITE request and the BYE request for the call that is transferred as a *Consultative* transfer.

SIP header values:

REFER 1: Refer-To ISC#3 URI;method=invite?Replaces=**call-id1**%3B**to-tag**%3D**S1**%3B
from-tag%3D**S1**&Require=replaces
Referred-By contains ISC#1 URI
REFER 2: Refer-To contains ISC#3/Transferee AS URI;method=invite
Referred-By contains ISC#1 URI
INVITE 3: Request URI = ISC#3/Transferee AS URI
Referred-By contains ISC#1 URI
INVITE 4: Request URI = ISC#3 URI
Replaces: **call-id1**;**to-tag**=**S1**;**from-tag**=**S1**
Referred-By contains ISC#1 URI
Require: replaces
NOTIFY(100):Event contains **refer**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**

Comments:

ISC#2		**AS Transferee**	**ISC#3**		**ISC#1**
		Establishment of session #1			
			Session #1 on hold		
		Establishment of session #2			
			Session #2 on hold		
		ISC#1 transfers ISC#2 to ISC#3			
			REFER	←	← REFER 1
REFER	←	REFER 2			
202 Accepted	→	202 Accepted			
			202 Accepted	→	→ 202 Accepted
INVITE (S2 inactive)	→	INVITE (inactive)			
200 OK (inactive)	←	200 OK (S2 inactive)			
ACK	→	ACK			
NOTIFY(100)	→				→ NOTIFY(100)
200 OK NOTIFY	←				← 200 OK NOTIFY
INVITE 3	→	INVITE			
			INVITE 4	→	INVITE
			180 Ringing	←	180 Ringing
180 Ringing	←	180 Ringing			
				←	200 OK
	200 OK	←	200 OK		
	ACK	→	ACK		
			ACK	→	ACK
NOTIFY(200)	→				→ NOTIFY(200)
200 OK NOTIFY	←				← 200 OK NOTIFY
BYE	←				← BYE (S1)
200 OK (BYE)	→				→ 200 OK (BYE)
		Apply post test routine			

TSS	TP	Reference	Selection expression
Netw/TransfereeAS	ECT_N02_004	4.5.2.7.3	PICS 4.5.1/2 AND PICS 4.7.1/7

Test purpose

The Referred-By header in the received INVITE does not contain the valid identity of the served user. Value is replaced.

If a Referred-By header is available in the INVITE request sent to the Transfer Target, the AS verifies the provided Referred-By header contains the value stored in the received REFER request.

If no match is found, the value of the Referred-By header is replaced by the value of the Referred-By header received in the REFER request.

SIP header values:

REFER 2: Refer-To URI; method=invite …
Referred-By **ISC#1**
INVITE 3: Referred-By **other URI** (PIXIT)
INVITE 4: Referred-By **ISC#1**

Comments:

ISC#2		**AS Transferee**		**ISC#3**		**ISC#1**
		Establishment of session #1				
						Session #1 on hold
		Establishment of session #2				
						Session #2 on hold
						ISC#1 transfers ISC#2 to ISC#3
			REFER	←	←	REFER 1
REFER	←	REFER 2				
202 Accepted	→	202 Accepted				
			202 Accepted	→	→	202 Accepted
NOTIFY(100)	→				→	NOTIFY(100)
200 OK NOTIFY	←				←	200 OK NOTIFY
INVITE 3	→	INVITE				
			INVITE 4	→	INVITE	
			180 Ringing	←	180 Ringing	
180 Ringing	←	180 Ringing				
				←	200 OK	
	200 OK	←	200 OK			
	ACK	→	ACK			
			ACK	→	ACK	
NOTIFY(200)	→				→	NOTIFY(200)
200 OK NOTIFY	←				←	200 OK NOTIFY
BYE	←				←	BYE
200 OK (BYE)	→				→	200 OK (BYE)

Apply post test routine

TSS	TP	Reference	Selection expression
Netw/TransfereeAS	ECT_N02_005	4.5.2.7.3	PICS 4.5.1/2 AND PICS 4.7.1/6

Test purpose

The Referred-By header in the received INVITE does not contain the valid identity of the served user. The request is rejected.

If a Referred-By header is available in the INVITE request sent to the Transfer Target, the AS verifies if the provided Referred-By header contains the value stored in the received REFER request.
If no match is found, the INVITE request is rejected.

SIP header values:

REFER 2: Refer-To URI; method=invite …
Referred-By **ISC#1**
INVITE 3: Referred-By **other URI** (PIXIT)

Comments:

ISC#2		**AS Transferee**	**ISC#3**		**ISC#1**
		Establishment of session #1			
					Session #1 on hold
		Establishment of session #2			
					Session #2 on hold
					ISC#1 transfers ISC#2 to ISC#3
			REFER	←	REFER 1
REFER	←	REFER 2			
202 Accepted	→	202 Accepted			
			202 Accepted	→	202 Accepted
NOTIFY(100)	→				NOTIFY(100)
200 OK NOTIFY	←				200 OK NOTIFY
INVITE 3	→	INVITE			
4xx	←	4xx			
ACK	→	ACK			
		Apply post test routine			

TSS	TP	Reference	Selection expression
Netw/TransfereeAS	ECT_N02_006	4.5.2.7.3	PICS 4.5.1/2 AND PICS 4.7.1/8

Test purpose

The received INVITE does not contain a Referred-By header.

If no **Referred-By** header is available in the INVITE request sent to the Transfer Target, the AS inserts a Referred-By header and the value is equal to the value stored in the received REFER request.

SIP header values:

REFER 2: Refer-To URI; method=invite …
Referred-By **ISC#1**
INVITE 3: (no Referred-By header)
INVITE 4: Referred-By **ISC#1**

Comments:

ISC#2		AS Transferee		ISC#3		ISC#1
		Establishment of session #1				
						Session #1 on hold
		Establishment of session #2				
						Session #1 on hold
						ISC#1 transfers ISC#2 to ISC#3
			REFER	←	←	REFER 1
REFER	←	REFER 2				
202 Accepted	→	202 Accepted				
			202 Accepted	→	→	202 Accepted
NOTIFY(100)	→				→	NOTIFY(100)
200 OK NOTIFY	←				←	200 OK NOTIFY
INVITE 3	→	INVITE				
			INVITE 4	→	INVITE	
			180 Ringing	←	180 Ringing	
180 Ringing	←	180 Ringing				
				←	200 OK	
	200 OK	←	200 OK			
	ACK	→	ACK			
			ACK	→	ACK	
NOTIFY(200)	→				→	NOTIFY(200)
200 OK NOTIFY	←				←	200 OK NOTIFY
BYE	←				←	BYE
200 OK (BYE)	→				→	200 OK (BYE)

Apply post test routine

TSS	TP	Reference	Selection expression
Netw/TransfereeAS	ECT_N02_007	4.5.2.4.1.2.3, 4.7.2.9.7/ [3]	PICS 4.5.1/2 AND PICS 4.7.1/2 AND PICS 4.7.1/4

Test purpose

Assured transfer*. The Transferee AS receives a 403 Forbidden indicating the Transferee does not support the REFER method.*

Ensure that three party call control applies at the Transferee AS when a 403 Forbidden is received upon a REFER was sent to the Transferee:

- A 202 Accepted for the REFER is sent.
- A NOTIFY containing a message/sipfrag body set to 'SIP/2.0 100 Trying' if the REFER request is accepted.
- An INVITE is sent to the Transfer Target containing the P-Asserted_identity of the Transferee and the Referred-By header with the identity of the Transferor.
- After the 200 OK is received, a reINVITE is sent to the Transferee containing the P-Asserted_identity of the Transfer Target and the Referred-By header with the identity of the Transferor.
- A NOTIFY containing a message/sipfrag body set to 'SIP/2.0 200 OK' if the refered communication is established.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI; method=invite
Referred-By contains **ISC#1** URI
INVITE 3: Request URI = **ISC#3**, P-Asserted-Identity=ISC#2, Referred-By=ISC#1
INVITE 4: Request URI = **ISC#2**, P-Asserted-Identity=ISC#3, Referred-By=ISC#1
NOTIFY(100):Event contains **refer**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**

Comments:

ISC#1		AS Transferor		ISC#2		ISC#3
		Establishment of session #1				
		Session #1 on hold				
REFER 1	→	REFER				
		REFER	→	REFER		
		403 Forbidden	←	403 Forbidden		
202 Accepted	←	202 Accepted				
		3 party call control applies				
		INVITE 3	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		200 OK	←		←	200 OK
		ACK	→		→	ACK
NOTIFY(100)	←	NOTIFY(100)				
200 OK NOTIFY	→	200 OK NOTIFY				
		INVITE 4	→	INVITE		
		200 OK	←	200 OK		
		ACK	→	ACK		
NOTIFY(200)	←	NOTIFY(200)				
200 OK NOTIFY	→	200 OK NOTIFY				
BYE	→	BYE				
200 OK (BYE)	←	200 OK (BYE)				
		Apply post test routine				

TSS	TP	Reference	Selection expression
Netw/TransfereeAS	ECT_N02_008	4.5.2.4.1.2.3, 4.7.2.9.7/ [3]	PICS 4.5.1/2 AND PICS 4.7.1/1 AND PICS 4.7.1/4

Test purpose

Blind transfer*. The Transferee AS receives a 403 Forbidden indicating the Transferee does not support the REFER method.*

Ensure that three party call control applies at the Transferee AS when a 403 Forbidden is received upon a REFER was sent to the Transferee:

- A 202 Accepted for the REFER is sent.
- A NOTIFY containing a message/sipfrag body set to 'SIP/2.0 100 Trying' if the REFER request is accepted.
- An INVITE is sent to the Transfer Target containing the P-Asserted_identity of the Transferee and the Referred-By header with the identity of the Transferor.
- After the 200 OK is received, a reINVITE is sent to the Transferee containing the P-Asserted_identity of the Transfer Target and the Referred-By header with the identity of the Transferor.
- A NOTIFY containing a message/sipfrag body set to 'SIP/2.0 200 OK' if the refered communication is established.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI; method=invite
Referred-By contains **ISC#1** URI
INVITE 3: Request URI = **ISC#3**, P-Asserted-Identity=ISC#2, Referred-By=ISC#1
INVITE 4: Request URI = **ISC#2**, P-Asserted-Identity=ISC#3, Referred-By=ISC#1
NOTIFY(100):Event contains **refer**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**

Comments:

ISC#1		AS Transferor		ISC#2		ISC#3
		Establishment of session #1				
		Session #1 on hold				
REFER 1	→	REFER				
		REFER	→	REFER		
		403 Forbidden	←	403 Forbidden		
202 Accepted	←	202 Accepted				
BYE	→					
200 OK (BYE)	←					
		3 party call control applies				
		INVITE 3	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		200 OK	←		←	200 OK
		ACK	→		→	ACK
NOTIFY(100)	←					
200 OK NOTIFY	→					
		INVITE 4	→	INVITE		
		200 OK	←	200 OK		
		ACK	→	ACK		
NOTIFY(200)	←	NOTIFY(200)				
200 OK NOTIFY	→	200 OK NOTIFY				
		Apply post test routine				

TSS	TP	Reference	Selection expression
Netw/TransfereeAS	ECT_N02_009	4.5.2.4.1.2.3, 4.7.2.9.7/ [3]	PICS 4.5.1/2 AND PICS 4.7.1/3 AND PICS 4.7.1/4

Test purpose

***Consultative transfer**. The Transferee AS receives a 403 Forbidden indicating the Transferee does not support the REFER method.*

Ensure that three party call control applies at the Transferee AS when a 403 Forbidden is received upon a REFER was sent to the Transferee:

- A 202 Accepted for the REFER is sent.
- A NOTIFY containing a message/sipfrag body set to 'SIP/2.0 100 Trying' if the REFER request is accepted.
- A reINVITE is sent to the Transfer Target containing the P-Asserted_identity of the Transferee and the Referred-By header with the identity of the Transferor.
- After the 200 OK is received, a reINVITE is sent to the Transferee containing the P-Asserted_identity of the Transfer Target and the Referred-By header with the identity of the Transferor.
- A NOTIFY containing a message/sipfrag body set to 'SIP/2.0 200 OK' if the refered communication is established.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI; method=invite
Referred-By contains **ISC#1** URI
INVITE 3: Request URI = **ISC#3**, P-Asserted-Identity=ISC#2, Referred-By=ISC#1
INVITE 4: Request URI = **ISC#2,** P-Asserted-Identity=ISC#3, Referred-By=ISC#1
NOTIFY(100):Event contains **refer**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**

Comments:

ISC#1		AS Transferor		ISC#2		ISC#3
		Establishment of session #1				
		Session #1 on hold				
		Establishment of session #2				
		Session #2 on hold				
REFER 1	→	REFER				
		REFER	→	REFER		
		403 Forbidden	←	403 Forbidden		
202 Accepted	←	202 Accepted				
		3 party call control applies				
		INVITE 3	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		200 OK	←		←	200 OK
		ACK	→		→	ACK
NOTIFY(100)	←	NOTIFY(100)				
200 OK NOTIFY	→	200 OK NOTIFY				
		INVITE 4	→	INVITE		
		200 OK	←	200 OK		
		ACK	→	ACK		
NOTIFY(200)	←	NOTIFY(200)				
200 OK NOTIFY	→	200 OK NOTIFY				
BYE(S1)	→	BYE				
200 OK (BYE)	←	200 OK (BYE)				
BYE	←	BYE(S2)				
200 OK (BYE)	→	200 OK (BYE)				
		Apply post test routine				

TSS	TP	Reference	Selection expression
Netw/TransfereeAS	ECT_N02_010	4.5.2.4.1.2.3, 4.7.2.9.7/ [3]	PICS 4.5.1/2 AND PICS 4.7.1/2 AND PICS 4.7.1/4

Test purpose

Assured transfer*. The Transferee AS receives a 501 Not implemented indicating the Transferee does not support the REFER method.*

Ensure that three party call control applies at the Transferee AS when a 501 Not implemented is received upon a REFER was sent to the Transferee:

- A 202 Accepted for the REFER is sent.
- An INVITE is sent to the Transfer Target containing the P-Asserted_identity of the Transferee and the Referred-By header with the identity of the Transferor.
- After the 200 OK is received, a reINVITE is sent to the Transferee containing the P-Asserted_identity of the Transfer Target and the Referred-By header with the identity of the Transferor.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI; method=invite
Referred-By contains **ISC#1** URI
INVITE 3: Request URI = **ISC#3**, P-Asserted-Identity=ISC#2, Referred-By=ISC#1
INVITE 4: Request URI = **ISC#2**, P-Asserted-Identity=ISC#3, Referred-By=ISC#1
NOTIFY(100):Event contains **refer**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**

Comments:

ISC#1		AS Transferor		ISC#2		ISC#3
		Establishment of session #1				
		Session #1 on hold				
REFER 1	→	REFER				
		REFER	→	REFER		
		501 Not implemented	←	501 Not implemented		
202 Accepted	←	202 Accepted				
		3 party call control applies				
		INVITE 3	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		200 OK	←		←	200 OK
		ACK	→		→	ACK
NOTIFY(100)	←	NOTIFY(100)				
200 OK NOTIFY	→	200 OK NOTIFY				
		INVITE 4	→	INVITE		
		200 OK	←	200 OK		
		ACK	→	ACK		
NOTIFY(200)	←	NOTIFY(200)				
200 OK NOTIFY	→	200 OK NOTIFY				
BYE	→	BYE				
200 OK (BYE)	←	200 OK (BYE)				
		Apply post test routine				

TSS	TP	Reference	Selection expression
Netw/TransfereeAS	ECT_N02_011	4.5.2.4.1.2.3, 4.7.2.9.7/ [3]	PICS 4.5.1/2 AND PICS 4.7.1/1 AND PICS 4.7.1/4

Test purpose

Blind transfer*. The Transferee AS receives a 501 Not implemented indicating the Transferee does not support the REFER method.*

Ensure that three party call control applies at the Transferee AS when a 501 Not implemented is received upon a REFER was sent to the Transferee:

- A 202 Accepted for the REFER is sent.
- An INVITE is sent to the Transfer Target containing the P-Asserted_identity of the Transferee and the Referred-By header with the identity of the Transferor.
- After the 200 OK is received, a reINVITE is sent to the Transferee containing the P-Asserted_identity of the Transfer Target and the Referred-By header with the identity of the Transferor.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI; method=invite
Referred-By contains **ISC#1** URI
INVITE 3: Request URI = **ISC#3**, P-Asserted-Identity=ISC#2, Referred-By=ISC#1
INVITE 4: Request URI = **ISC#2**, P-Asserted-Identity=ISC#3, Referred-By=ISC#1
NOTIFY(100):Event contains **refer**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**

Comments:

ISC#1		AS Transferor		ISC#2		ISC#3
		Establishment of session #1				
		Session #1 on hold				
REFER 1	→	REFER				
		REFER	→	REFER		
		501 Not implemented	←	501 Not implemented		
202 Accepted	←	202 Accepted				
BYE	→					
200 OK (BYE)	←					
		3 party call control applies				
		INVITE 3	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		200 OK	←		←	200 OK
		ACK	→		→	ACK
NOTIFY(100)	←					
200 OK NOTIFY	→					
		INVITE 4	→	INVITE		
		200 OK	←	200 OK		
		ACK	→	ACK		
NOTIFY(200)	←	NOTIFY(200)				
200 OK NOTIFY	→	200 OK NOTIFY				
		Apply post test routine				

TSS	TP	Reference	Selection expression
Netw/TransfereeAS	ECT_N02_012	4.5.2.4.1.2.3, 4.7.2.9.7/ [3]	PICS 4.5.1/2 AND PICS 4.7.1/3 AND PICS 4.7.1/4

Test purpose

Consultative transfer*. The Transferee AS receives a 501 Not implemented indicating the Transferee does not support the REFER method.*

Ensure that three party call control applies at the Transferee AS when a 501 Not implemented is received upon a REFER was sent to the Transferee:

- A 202 Accepted for the REFER is sent.
- A reINVITE is sent to the Transfer Target containing the P-Asserted_identity of the Transferee and the Referred-By header with the identity of the Transferor.
- After the 200 OK is received, a reINVITE is sent to the Transferee containing the P-Asserted_identity of the Transfer Target and the Referred-By header with the identity of the Transferor.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI; method=invite
Referred-By contains **ISC#1** URI
INVITE 3: Request URI = **ISC#3**, P-Asserted-Identity=ISC#2, Referred-By=ISC#1
INVITE 4: Request URI = **ISC#2,** P-Asserted-Identity=ISC#3, Referred-By=ISC#1
NOTIFY(100):Event contains **refer**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**

Comments:

ISC#1		AS Transferor		ISC#2		ISC#3
		Establishment of session #1				
		Session #1 on hold				
		Establishment of session #2				
		Session #2 on hold				
REFER 1	→	REFER				
			REFER	→	REFER	
			501 Not implemented	←	501 Not implemented	
202 Accepted	←	202 Accepted				
		3 party call control applies				
			INVITE 3	→		→ INVITE
			180 Ringing	←		← 180 Ringing
			200 OK	←		← 200 OK
			ACK	→		→ ACK
NOTIFY(100)	←	NOTIFY(100)				
200 OK NOTIFY	→	200 OK NOTIFY				
			INVITE 4	→	INVITE	
			200 OK	←	200 OK	
			ACK	→	ACK	
NOTIFY(200)	←	NOTIFY(200)				
200 OK NOTIFY	→	200 OK NOTIFY				
BYE(S1)	→	BYE				
200 OK (BYE)	←	200 OK (BYE)				
BYE	←	BYE(S2)				
200 OK (BYE)	→	200 OK (BYE)				
		Apply post test routine				

TSS	TP	Reference	Selection expression
Netw/TransfereeAS	ECT_N02_013	4.5.2.4.1.2.3, 4.7.2.9.7/ [3]	PICS 4.5.1/2 AND PICS 4.7.1/2 AND PICS 4.7.1/5

Test purpose

Assured transfer*. The Transferee AS initiate the special REFER handling procedures directly.*

Ensure that three party call control applies at the Transferee AS directly when the AS has prior **knowledge** that **the Transferee is not allowed** to receive or **does not support the REFER method**:

- A 202 Accepted for the REFER is sent.
- A NOTIFY request is sent to the Transferor containing a message/sipfrag body set to 'SIP/2.0 100 Trying' after the REFER request is accepted.
- An INVITE is sent to the Transfer Target containing the P-Asserted_identity of the Transferee and the Referred-By header with the identity of the Transferor.
- After the 200 OK is received, a reINVITE is sent to the Transferee containing the P-Asserted_identity of the Transfer Target and the Referred-By header with the identity of the Transferor.
- A NOTIFY request is sent to the Transferor containing a message/sipfrag body set to 'SIP/2.0 200 OK' after the referred communication is confirmed.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI; method=invite
Referred-By contains **ISC#1** URI
INVITE 3: Request URI = **ISC#3**, P-Asserted-Identity=ISC#2, Referred-By=ISC#1
INVITE 4: Request URI = **ISC#2**, P-Asserted-Identity=ISC#3, Referred-By=ISC#1
NOTIFY(100):Event contains **refer**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**

Comments:

ISC#1	AS Transferor	ISC#2	ISC#3
	Establishment of session #1		
	Session #1 on hold		
REFER 1	→ REFER		
202 Accepted	← 202 Accepted		
	3 party call control applies		
	INVITE 3 →		→ INVITE
	180 Ringing ←		← 180 Ringing
	200 OK ←		← 200 OK
	ACK →		→ ACK
NOTIFY(100)	← NOTIFY(100)		
200 OK NOTIFY	→ 200 OK NOTIFY		
	INVITE 4 →	INVITE	
	200 OK ←	200 OK	
	ACK →	ACK	
NOTIFY(200)	← NOTIFY(200)		
200 OK NOTIFY	→ 200 OK NOTIFY		
BYE	→ BYE		
200 OK (BYE)	← 200 OK (BYE)		
	Apply post test routine		

TSS	TP	Reference	Selection expression
Netw/TransfereeAS	ECT_N02_014	4.5.2.4.1.2.3, 4.7.2.9.7/ [3]	PICS 4.5.1/2 AND PICS 4.7.1/1 AND PICS 4.7.1/5

Test purpose

Blind transfer*. The Transferee AS initiate the special REFER handling procedures directly.*

Ensure that three party call control applies at the Transferee AS directly when the AS has prior **knowledge** that **the Transferee is not allowed** to receive or **does not support the REFER method**:

- A 202 Accepted for the REFER is sent.
- A NOTIFY request is sent to the Transferor containing a message/sipfrag body set to 'SIP/2.0 100 Trying' after the REFER request is accepted.
- An INVITE is sent to the Transfer Target containing the P-Asserted_identity of the Transferee and the Referred-By header with the identity of the Transferor.
- After the 200 OK is received, a reINVITE is sent to the Transferee containing the P-Asserted_identity of the Transfer Target and the Referred-By header with the identity of the Transferor.
- A NOTIFY request is sent to the Transferor containing a message/sipfrag body set to 'SIP/2.0 200 OK' after the referred communication is confirmed.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI; method=invite
Referred-By contains **ISC#1** URI
INVITE 3: Request URI = **ISC#3**, P-Asserted-Identity=ISC#2, Referred-By=ISC#1
INVITE 4: Request URI = **ISC#2**, P-Asserted-Identity=ISC#3, Referred-By=ISC#1
NOTIFY(100):Event contains **refer**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**

Comments:

ISC#1		**AS Transferor**	**ISC#2**	**ISC#3**
		Establishment of session #1		
		Session #1 on hold		
REFER 1	→	REFER		
202 Accepted	←	202 Accepted		
BYE	→			
200 OK (BYE)	←			
		3 party call control applies		
		INVITE 3 →		→ INVITE
		180 Ringing ←		← 180 Ringing
		200 OK ←		← 200 OK
NOTIFY(100)	←			
200 OK NOTIFY	→			
		ACK →		→ ACK
		INVITE 4 →	INVITE	
		200 OK ←	200 OK	
		ACK →	ACK	
NOTIFY(200)	←	NOTIFY(200)		
200 OK NOTIFY	→	200 OK NOTIFY		
		Apply post test routine		

TSS	TP	Reference	Selection expression
Netw/TransfereeAS	ECT_N02_015	4.5.2.4.1.2.3, 4.7.2.9.7/ [3]	PICS 4.5.1/2 AND PICS 4.7.1/3 AND PICS 4.7.1/5

Test purpose

Consultative transfer*. The Transferee AS initiate the special REFER handling procedures directly.*

Ensure that three party call control applies directly at the Transferee AS when the AS has prior **knowledge** that **the Transferee is not allowed** to receive or **does not support the REFER method**:

- A 202 Accepted for the REFER is sent.
- A NOTIFY request is sent to the Transferor containing a message/sipfrag body set to 'SIP/2.0 100 Trying' after the REFER request is accepted.
- A reINVITE is sent to the Transfer Target containing the P-Asserted_identity of the Transferee and the Referred-By header with the identity of the Transferor.
- After the 200 OK is received, a reINVITE is sent to the Transferee containing the P-Asserted_identity of the Transfer Target and the Referred-By header with the identity of the Transferor.
- A NOTIFY request is sent to the Transferor containing a message/sipfrag body set to 'SIP/2.0 200 OK' after the referred communication is confirmed.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI; method=invite
Referred-By contains **ISC#1** URI
INVITE 3: Request URI = **ISC#3**, P-Asserted-Identity=ISC#2, Referred-By=ISC#1
INVITE 4: Request URI = **ISC#2,** P-Asserted-Identity=ISC#3, Referred-By=ISC#1
NOTIFY(100):Event contains **refer**
message/sipfrag contains **SIP/2.0 100 Trying**
NOTIFY(200):Event contains **refer**
message/sipfrag contains **SIP/2.0 200 OK**

Comments:

ISC#1		**AS Transferor**	**ISC#2**		**ISC#3**
		Establishment of session #1			
		Session #1 on hold			
		Establishment of session #2			
REFER 1	→	REFER			
202 Accepted	←	202 Accepted			
		3 party call control applies			
		INVITE 3 →		→	INVITE
		180 Ringing ←		←	180 Ringing
		200 OK ←		←	200 OK
		ACK →		→	ACK
NOTIFY(100)	←	NOTIFY(100)			
200 OK NOTIFY	→	200 OK NOTIFY			
		INVITE 4 →	INVITE		
		200 OK ←	200 OK		
		ACK →	ACK		
NOTIFY(200)	←	NOTIFY(200)			
200 OK NOTIFY	→	200 OK NOTIFY			
BYE(S1)	→	BYE			
200 OK (BYE)	←	200 OK (BYE)			
BYE	←	BYE(S2)			
200 OK (BYE)	→	200 OK (BYE)			
		Apply post test routine			

5.2.5 Actions at the transfer target's UE

TSS	**TP**	**Reference**	**Selection expression**
User/TransferTarget	ECT_U03_001	4.5.2.17	PICS 4.5.1/1 AND

Test purpose

The User Equipment receives the request to terminate a communication to the transferor.

Ensure that a User Equipment in a confirmed session receives an INVITE request to establish a new session that and a Replaces header is present (consultative transfer):

- The User Equipment accepts the request
- The User Equipment terminates the session indicated in the Replaces header

SIP header values:

INVITE: Request URI: **Gm#1**
Referred-By contains any URI
Replaces: <CallID Session #1>;to-tag=<Session #1;from-tag=<Session #1>

Comments:

UE (Gm#1)		**Test equipment (Gm#2)**
	Establishment of session #1	
INVITE	←	INVITE (Session #2)
180 Ringing	→	180 Ringing
200 OK INVITE	→	200 OK INVITE
ACK	←	ACK
BYE (Session #1)	→	BYE
200 OK BYE	←	200 OK BYE
	Apply post test routine	

TSS	**TP**	**Reference**	**Selection expression**
User/TransferTarget	ECT_U03_002	4.5.2.17	PICS 4.5.1/1 AND

Test purpose

The User Equipment receives a Referred-By header.

- Ensure that a User Equipment receives a Referred-By header in an INVITE request accepts the request.

SIP header values:

INVITE: Request URI: **Gm#1**
Referred-By contains any URI

Comments:

UE (Gm#1)		**Test equipment (Gm#2)**
	Establishment of session #1	
INVITE	←	INVITE (Session #2)
180 Ringing	→	180 Ringing
200 OK INVITE	→	200 OK INVITE
ACK	←	ACK
BYE (Session #1)	→	BYE
200 OK BYE	←	200 OK BYE
	Apply post test routine	

5.2.6 Interaction with other services

5.2.6.1 Originating identification restriction (OIR)

TSS	**TP**	**Reference**	**Selection expression**
Interaction/OIR	ECT_N03_001	4.6.5	PICS 4.5.1/2 AND PICS 7.7.2/1

Test purpose

Referred-By header Privacy regarding the requested privacy for the P-Asserted-Identity.

Ensure that a Privacy header is present and the value 'user' is included in addition if the Privacy header was received with the value 'id'.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI; method=invite
Referred-By contains **ISC#1** URI
P-Asserted-Identity **ISC#1** URI
Privacy: id

REFER 2: Refer-To contains **ISC#3** URI; method=invite
Referred-By contains **ISC#1** URI
P-Asserted-Identity **ISC#1** URI
Privacy: id, user

Comments:

ISC#1		**AS Transferor**		**ISC#2**		**ISC#3**
		Establishment of session #1				
		Session #1 on hold				
		Establishment of session #2				
		ISC#1 transfers ISC#2 to ISC#3				
REFER 1	→	REFER				
		REFER 2	→	REFER		
		202 Accepted	←	202 Accepted		
202 Accepted	←	202 Accepted				
NOTIFY(100)	←		←	NOTIFY(100)		
200 OK NOTIFY	→		→	200 OK NOTIFY		
		INVITE	←	INVITE 3		
		INVITE 4	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		180 Ringing	→	180 Ringing		
		200 OK	←		←	200 OK
		200 OK	→	200 OK		
				ACK	→	ACK
NOTIFY(200)	←		←	NOTIFY(200)		
200 OK NOTIFY	→		→	200 OK NOTIFY		
BYE	→		→	BYE		
200 OK (BYE)	←		←	200 OK (BYE)		
		Apply post test routine				

TSS	TP	Reference	Selection expression
Interaction/OIR	ECT_N03_002	4.6.5	PICS 4.5.1/2 AND PICS 7.7.2/1

Test purpose

Privacy header in the INVITE of the Transferee is set according previous received privacy indication.

Ensure that the INVITE request sent to the transfer target has the same privacy requirements as previous received in initial call between the transferee and the transferor.

- Transferee sends a Privacy header value 'id' in the 200 OK INVITE of the initial call. The SUT inserts a Privacy header set to 'id' if the INVITE request sent to the Transfer target does not contain a Privacy header.

SIP header values:

200 OK INVITE 1: Privacy: id
INVITE 3: (no Privacy header)
INVITE 4: Privacy: id

Comments:

ISC#1		AS Transferor		ISC#2		ISC#3
INVITE 1	→		→	INVITE		
180 Ringing	←		←	180 Ringing		
200 OK (INVITE)	←		←	200 OK (INVITE) 1		
ACK	→		→	ACK		
INVITE (sendonly)	→		→	INVITE (sendonly)		
200 OK (recvonly)	←		←	200 OK (recvonly)		
ACK	→		→	ACK		
INVITE 2	→				→	INVITE
180 Ringing	←				←	180 Ringing
200 OK (INVITE)	←				←	200 OK (INVITE)
ACK	→				→	ACK
INVITE (sendonly)	→				→	INVITE (sendonly)
200 OK (recvonly)	←				←	200 OK (recvonly)
ACK	→				→	ACK
REFER	→	REFER				
		REFER	→	REFER		
		202 Accepted	←	202 Accepted		
202 Accepted	←	202 Accepted				
NOTIFY(100)	←		←	NOTIFY(100)		
200 OK NOTIFY	→		→	200 OK NOTIFY		
		INVITE	←	INVITE 3		
		INVITE 4	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		180 Ringing	→	180 Ringing		
		200 OK	←		←	200 OK
		200 OK	→	200 OK		
				ACK	→	ACK
NOTIFY(200)	←		←	NOTIFY(200)		
200 OK NOTIFY	→		→	200 OK NOTIFY		
BYE	→		→	BYE		
200 OK (BYE)	←		←	200 OK (BYE)		

Apply post test routine

TSS	TP	Reference	Selection expression
Interaction/OIR	ECT_N03_003	4.6.5	PICS 4.5.1/2 AND PICS 7.7.2/1

Test purpose

Privacy header in the INVITE of the Transferee is set according previous received privacy indication.

Ensure that the INVITE request sent to the transfer target has the same privacy requirements as previous received in initial call between the transferee and the transferor.

- Transferee sends a Privacy header value 'id' in the INVITE of the initial call. The SUT inserts a Privacy header set to 'id' if the INVITE request sent to the Transfer target does not contain a Privacy header.

SIP header values:

INVITE 1: Privacy: id
INVITE 3: (no Privacy header)
INVITE 4: Privacy: id

Comments:

ISC#1		AS Transferor		ISC#2		ISC#3
INVITE	←		←	INVITE 1		
180 Ringing	→		→	180 Ringing		
200 OK (INVITE)	→		→	200 OK (INVITE) 1		
ACK	←		←	ACK		
INVITE (sendonly)	→		→	INVITE (sendonly)		
200 OK (recvonly)	←		←	200 OK (recvonly)		
ACK	→		→	ACK		
INVITE 2	→				→	INVITE
180 Ringing	←				←	180 Ringing
200 OK (INVITE)	←				←	200 OK (INVITE)
ACK	→				→	ACK
INVITE (sendonly)	→				→	INVITE (sendonly)
200 OK (recvonly)	←				←	200 OK (recvonly)
ACK	→				→	ACK
REFER	→	REFER				
		REFER	→	REFER		
		202 Accepted	←	202 Accepted		
202 Accepted	←	202 Accepted				
NOTIFY(100)	←		←	NOTIFY(100)		
200 OK NOTIFY	→		→	200 OK NOTIFY		
		INVITE	←	INVITE 3		
		INVITE 4	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		180 Ringing	→	180 Ringing		
		200 OK	←		←	200 OK
		200 OK	→	200 OK		
				ACK	→	ACK
NOTIFY(200)	←		←	NOTIFY(200)		
200 OK NOTIFY	→		→	200 OK NOTIFY		
BYE	→		→	BYE		
200 OK (BYE)	←		←	200 OK (BYE)		

Apply post test routine

5.2.6.2 Anonymous Communication Rejection and Communication Barring (ACR/CB)

TSSInteraction/ACR-CB	**TP** ECT_N04_001	**Reference** 4.6.9	**Selection expression** PICS 4.5.1/2 AND PICS 7.7.2/2

Test purpose

transfer requests with a Transfer Target that is barred by the served users Outgoing Communication Barring (OCB) rules.

Ensure that the As does not accept a transfer requests with a transfer Target that is barred by the Transferor's Outgoing Communication Barring (OCB) rules.

Precondition: The Transfer Target is barred by the Transferor's Outgoing Communication Barring rules.

SIP header values:

REFER 1: Refer-To contains **ISC#3** URI; method=invite
Referred-By contains **ISC#1** URI

Comments:

ISC#1	**AS Transferor**	**ISC#2**	**ISC#3**
	Establishment of session #1		
INVITE	←	←	INVITE 1
180 Ringing	→	→	180 Ringing
200 OK (INVITE)	→	→	200 OK (INVITE)
ACK	←	←	ACK
INVITE 2 (sendonly)	→	→	INVITE (sendonly)
200 OK (recvonly)	←	←	200 OK (recvonly)
ACK	→	→	ACK
	ISC#1 transfers ISC#2 to ISC#3		
REFER 1	→	REFER	
403 Forbidden	←	403 Forbidden	
	Apply post test routine		

5.2.6.3 CONFerence Calling (CONF)

TSS	TP	Reference	Selection expression
Interaction/CONF	ECT_N05_001	4.6.6	PICS 4.5.1/2 AND PICS 4.7.1/1 AND PICS 7.7.2/3

Test purpose
ECT does not apply if the Refer-To header of the REFER request dialogue contains the URI targeted a conference invited by REFER.
Ensure that ECT does not apply if the "Isfocue" parameter was received in the Contact header of a 1xx or 200 OK response in a dialogue to join a conference after received a REFER request to refer to the conference. The REFER request is rejected with a 4xx or 5xx or 6xx unsuccessful final response.

SIP header values:
INVITE: Request URI=conference factory URI
200 OK (INVITE) 1:
Contact: conference URI; isfocus
REFER 1: Request URI=ISC#2
Refer-To conference URI;method=invite
Referred-By **ISC#1** URI

Comments:

ISC#ISC#1		**AS Transferor**		**AS CONF**
		A conference is already established		
REFER	←		←	REFER
202 Accepted	→		→	202 Accepted
INVITE	→		→	INVITE
180 Ringing	←		←	180 Ringing
200 OK (INVITE)	←		←	200 OK (INVITE)
ACK	→		→	ACK
REFER	→	REFER		
4xx or 5xx or 6xx Response	←	4xx or 5xx or 6xx Response		
		Apply post test routine		

TSS	TP	Reference	Selection expression
Interaction/CONF	ECT_N05_002	4.6.6	PICS 4.5.1/2 AND PICS 4.7.1/1 AND PICS 7.7.2/3

Test purpose
ECT does not apply if the Refer-To header of the REFER request dialogue contains the URI targeted a conference invited by INVITE.
Ensure that ECT does not apply if the "Isfocue" parameter was received in the Contact header of a 1xx or 200 OK response in a dialogue to join a conference after received a INVITE request. The REFER request is rejected with a 4xx or 5xx or 6xx unsuccessful final response.

SIP header values:
INVITE: **ISC#1** URI
Contact: conference URI; isfocus

Comments:

ISC#ISC#1		**AS Transferor**		**AS CONF**
		A conference is already established		
INVITE	←		←	INVITE
180 Ringing	→		→	180 Ringing
200 OK (INVITE)	→		→	200 OK (INVITE)
ACK	←		←	ACK
REFER	→	REFER		
4xx or 5xx or 6xx Response	←	4xx or 5xx or 6xx Response		
		Apply post test routine		

TSS	TP	Reference	Selection expression
Interaction/CONF	ECT_N05_003	4.6.6	PICS 4.5.1/2 AND PICS 4.7.1/1 AND PICS 7.7.2/3

Test purpose
ECT does not apply if the a conference controller invokes ECT.
Ensure that ECT does not apply if the conference controller invokes ECT. The REFER request is rejected with a 4xx or 5xx or 6xx unsuccessful final response.

SIP header values:
INVITE 1: conference factory URI

Comments:

ISC#ISC#1		AS Transferor		AS CONF
INVITE 1	→		→	INVITE
200 OK (INVITE)	←		←	200 OK (INVITE)
		Invite an other user to the conference		
REFER	→	REFER		
4xx or 5xx or 6xx Response	←	4xx or 5xx or 6xx Response		
		Apply post test routine		

5.2.6.4 Explicit Communication Transfer (ECT)

TSS	TP	Reference	Selection expression
Interaction/ECT	ECT_N06_001	4.6.10.2, 4.6.10.3	PICS 4.5.1/2 AND PICS 4.7.1/1

Test purpose
*Interaction with ECT: **Blind transfer**.*
A session between ISC#1 and ISC#2 exists and was transferred before.
Ensure that if the INVITE dialog on which the REFER is received is a previously transferred communication indicated by the presence of a Referred-By header in the INVITE request the:
- REFER is forwarded and the value of the Refer-To header is replaced by the ECT session Identifier.
- The Request URI of the INVITE request received to forward to the Transfer Target is replaced with the value of the Transfer Target.

SIP header values:
REFER 1: Refer-To **ISC#3** URI; method=invite
Referred-By **ISC#1** URI
REFER 2: Refer-To **ECT Session Identifier** URI; method=invite
Referred-By **ISC#1** URI
INVITE 2: Request URI = **ECT Session Identifier** URI
Referred-By **ISC#1** URI
INVITE 3: Request URI = **ISC#3** URI
Referred-By **ISC#1** URI

Comments:

ISC#ISC#1		AS Transferor		ISC#ISC#2		ISC#ISC#3
A transferred communication already exists						
Session #1 on hold						
REFER 1	→	REFER				
		REFER 2	→	REFER		
		202 Accepted	←	202 Accepted		
202 Accepted	←	202 Accepted				
BYE	→		→	BYE		
200 OK (BYE)	←		←	200 OK (BYE)		
		INVITE	←	INVITE 2 (S2)		
		INVITE 3	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		180 Ringing	→	180 Ringing		
		200 OK	←		←	200 OK
		200 OK	→	200 OK		
				ACK	→	ACK
		Apply post test routine				

TSS	**TP**	**Reference**	**Selection expression**
Interaction/ECT	ECT_N06_002	4.6.10.2, 4.6.10.3	PICS 4.5.1/2 AND PICS 4.7.1/2

Test purpose

Interaction with ECT: ***Assured transfer****.*

A session between ISC#1 and ISC#2 exists and was transferred before.

Ensure that if the INVITE dialog on which the REFER is received is a previously transferred communication indicated by the presence of a Referred-By header in the INVITE request the:

- REFER is forwarded and the value of the Refer-To header is replaced by the ECT session Identifier.
- The Request URI of the INVITE request received to forward to the Transfer Target is replaced with the value of the Transfer Target.

SIP header values:

REFER 1: Refer-To **ISC#3** URI; method=invite
Referred-By **ISC#1** URI
REFER 2: Refer-To **ECT Session Identifier** URI; method=invite
Referred-By ISC#ISC#1 URI
INVITE 2: Request URI = **ECT Session Identifier** URI
Referred-By **ISC#1** URI
INVITE 3: Request URI = **ISC#3** URI
Referred-By **ISC#1** URI

Comments:

ISC#1		**AS Transferor**		**ISC#2**		**ISC#3**
A transferred communication already exists						
Session #1 on hold						
REFER 1	→	REFER				
		REFER 2	→	REFER		
		202 Accepted	←	202 Accepted		
		INVITE	←	INVITE 2 (S2)		
		INVITE 3	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		180 Ringing	→	180 Ringing		
		200 OK	←		←	200 OK
		200 OK	→	200 OK		
				ACK	→	ACK
Apply post test routine						

TSS	**TP**	**Reference**	**Selection expression**
Interaction/ECT	ECT_N06_003	4.6.10.2, 4.6.10.3	PICS 4.5.1/2 AND PICS 4.7.1/3

Test purpose

Interaction with ECT: ***Consultative transfer****.*

A session between ISC#1 and ISC#2 exists and was transferred before.

Ensure that if the INVITE dialog on which the REFER is received is a previously transferred communication indicated by the presence of a Referred-By header in the INVITE request the:

- REFER is forwarded and the value of the Refer-To header is replaced by the ECT session Identifier.
- The Request URI of the INVITE request received to forward to the Transfer Target is replaced with the value of the Transfer Target.

SIP header values:

INVITE 1: Request URI = **ISC#3**

REFER 1: Refer-To **ISC#3 URI;** method=invite?Replaces=**call-id-S2**%3B **to-tag=S2**%3B **from-tag=S2**&Require=replaces
Referred-By **ISC#1** URI

REFER 2: Refer-To contains **ECT Session Identifier URI;** method=invite
Referred-By contains **ISC#1** URI

INVITE 2: Request URI = **ECT Session Identifier** URI Referred-By **ISC#1** URI

INVITE 3: Request URI = **ISC#3** URI
Replaces=**call-id-S2; to-tag=S2**; **from-tag=S2**
Referred-By **ISC#1** URI
Require: replaces

Comments:

ISC#1		**AS Transferor**		**ISC#2**		**ISC#3**
A transferred communication already exists						
INVITE 1 (S1)	→				→	INVITE
180 Ringing	←				←	180 Ringing
200 OK (INVITE)	←				←	200 OK (INVITE)
ACK	→				→	ACK
INVITE (sendonly)	→				→	INVITE (sendonly)
200 OK (recvonly)	←				←	200 OK (recvonly)
ACK	→				→	ACK
REFER 1	→	REFER				
		REFER 2	→	REFER		
		202 Accepted	←	202 Accepted		
202 Accepted	←	202 Accepted				
INVITE (inactive)	←		←	INVITE (inactive)		
200 OK (inactive)	→		→	200 OK (inactive)		
ACK	←		←	ACK		
NOTIFY(100)	←		←	NOTIFY(100)		
200 OK NOTIFY	→		→	200 OK NOTIFY		
		INVITE	←	INVITE 2 (S3)		
		INVITE 3	→		→	INVITE
		180 Ringing	←		←	180 Ringing
		180 Ringing	→	180 Ringing		
		200 OK	←		←	200 OK
		200 OK	→	200 OK		
				ACK	→	ACK
NOTIFY(200)	←		←	NOTIFY(200)		
200 OK NOTIFY	→		→	200 OK NOTIFY		
BYE	←				←	BYE (S2)
200 OK (BYE)	→				→	200 OK (BYE)
BYE (S1)	→		→	BYE		
200 OK (BYE)	←		←	200 OK (BYE)		
Apply post test routine						

Annex A (informative): Bibliography

ETSI TS 123 228: "Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; IP Multimedia Subsystem (IMS); Stage 2 (3GPP TS 23.228 Release 10)".

History

Document history		
V5.1.1	October 2012	Publication